

**THE IMPLEMENTATION OF PROBLEM-BASED LEARNING TOWARDS
SUSTAINABLE LEARNING ENVIRONMENT AT A HIGHER EDUCATION
INSTITUTION**

BY

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DECLARATION

I, **KHOSANA TLADI**, declare that the contents of this thesis represent my own unaided work, and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

K TLADI

DATE

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DEDICATION

This thesis is dedicated to my late father S.D Tladi and my mother M.N Tladi for their endless love, prayers, encouragement and support. It would not have been possible for me without the support of my dearest family members, S Tladi, K Tladi, M Tladi, V Tladi and my cousins, Tumelo and Moiponyana Tladi. A special word of gratitude to Sebata Ntate Thyse and Ntate Phori for their unwavering support and for being there for me.

ABSTRACT

Problem-Based Learning is a pedagogical methodology that seeks to develop competent, self-directed, independent-thinking, solution-oriented and pragmatic students, using methods that involve practical problem solving. It is a direct challenge to the conventional teaching methods that are centred on the instructor who directs the theoretical learning process involving minimum student participation. It is also associated with the transformation of education into a vehicle for social justice, political and economic building of a democratic state – a phenomenon referred to in the literature as the sustainable learning environment.

The research was based on a Critical Emancipation Research paradigm, using Participative Action Research (PAR) as a research method. It applied a case study research design to study how PBL can be effectively implemented within higher education institutions. It was conducted at Tshwane University of Technology (TUT), Faculty of Arts among graphic designing students. Data was mainly qualitative and was collected through observation, focus group discussions and structured questionnaires. Data was analysed using narrative analysis, critical discourse analysis, thematic analysis and frequency analysis.

PBL, as noted, had various advantages, including making students more competitive in the job market, being good team members and having quality technical, interpersonal and strategic competences. The study also concluded that PBL, because of its focus on problem solving, interaction within diversity and a better comprehension of real-world challenges, had a high appeal in the development of a sustainable learning environment and contributing to social justice and transformation. Due to its many benefits, it was recommended that PBL should be implemented at TUT.

The study recommended a nine-step process in the implementation of PBL. It further recommended that an Integrated PBL model was the best form as it enabled students to benefit from both the advantages of PBL and traditional didactic learning. Additionally, it gave students opportunities to adapt to PBL, while still benefitting from traditional didactic learning.

CONTENTS

DECLARATION	ii
ACKNOWLEDGEMENTS	iii
DEDICATION	iv
ABSTRACT	v
CHAPTER 1: INTRODUCTION TO THE STUDY	1
1.1 INTRODUCTION	1
1.2 BACKGROUND TO THE STUDY.....	3
1.2.1 The Higher Education Act of 1997	4
1.2.2 The Council on Higher Education (CHE)	5
1.2.3 CHE and PBL processes:	6
1.2.4 International Colloquium of the Sustainable Learning Environments.....	7
1.3 RESEARCH CONTEXT: TUT	8
1.4 PROBLEM STATEMENT	10
1.5 AIM OF THE STUDY	12
1.6 RESEARCH OBJECTIVES	14
1.7 RESEARCH QUESTIONS.....	14
1.8 METHODOLOGY	15
1.9 CLARIFICATION OF TERMS	16
1.9.1 Problem-Based learning	17
1.9.2 Pedagogy	17
1.9.3 Traditional didactic learning (TDL)	17
1.9.4 Sustainable learning environment.....	17
1.10 STRUCTURE OF THE THESIS.....	18
1.10.1 Chapter 2: Theoretical framework and literature review	18
1.10.2 Chapter 3: Methodology	19
1.10.3 Chapter 4: Findings and discussion: Implementation of Problem-Based Learning	19
1.10.4 Chapter 5: Conclusions and recommendations	19
2 CHAPTER TWO: THEORETICAL FRAMEWORK AND LITERATURE REVIEW OF PBL	20
2.1 INTRODUCTION	20
2.2 THE HISTORY OF PBL	20
2.3 THEORETICAL FRAMEWORK	21

2.3.1	PBL within the Constructivist way of thinking	22
2.3.2	Sustainable learning environment	24
2.4	DEFINITIONS OF PBL AND SLE	26
2.4.1	Problem-Based Learning	26
2.5	PBL VERSUS TRADITIONAL DIDACTIC TEACHING METHOD	29
2.5.1	PBL as a complete unit of TDL (integrated traditional approach).....	30
2.5.2	TDL as a complete unit of PBL (Integrated PBL approach)	31
2.5.3	PBL as independent yet integrated with PBL.....	32
2.5.4	Stand-alone PBL and Stand-alone TDL.....	33
2.6	Problem-Based Learning as a strategy.....	35
2.6.1	PBL strategy in learning.....	37
2.7	PBL AND THE STUDENT	38
2.7.1	Student factors affecting implementation of PBL.....	40
2.7.2	General student challenges	43
2.8	PBL AND THE LECTURER/FACILITATOR	44
2.8.1	Facilitator’s roles and responsibilities in Problem-Based Learning	45
2.8.2	Facilitator-related challenges in PBL implementation.....	48
2.9	Leadership and Faculty staff roles under PBL.....	51
2.10	Curriculum design factors	52
2.10.1	Case-based curriculum.....	53
2.10.2	Problems as part of the curriculum	57
2.10.3	Student Assessments in PBL	59
2.11	Resources and PBL implementation	62
2.12	ADVANTAGES OF PBL.....	64
2.12.1	Bridging the theory-practice gap	64
2.12.2	Improving of communication skills among students	65
2.12.3	Conflict management skills	66
2.12.4	Team and group management skills.....	67
2.12.5	Leadership skills	67
2.12.6	Problem-solving skills.....	68
2.12.7	Contextual knowledge	69
2.12.8	Interest in learning.....	69
2.13	CRITICISMS OF THE PBL APPROACH.....	70

2.13.1	Poor high-content coverage	70
2.13.2	Unproven superiority over traditional T&L.....	71
2.13.3	Lack of operational efficiency	71
2.13.4	Excessive dependency on student’s abilities	72
2.13.5	Unfavourable group dynamics and personality issues	72
2.13.6	Low acceptance by educators.....	73
2.14	PBL IN CREATING A SUSTAINABLE LEARNING ENVIRONMENT	73
2.14.1	Social justice in education.....	74
2.14.2	PBL and social justice	76
2.14.3	PBL and Social transformation	77
2.14.4	Transformation through diversity.....	79
2.15	CHAPTER SUMMARY	80
3	CHAPTER 3: RESEARCH METHODOLOGY AND DESIGN	82
3.1	INTRODUCTION	82
3.2	QUALITATIVE, PARTICIPATORY ACTION RESEARCH AND OBJECTIVES.....	83
3.2.1	Participatory Action Research.....	85
3.2.2	Views and definitions.....	85
3.2.3	Objectives of PAR.....	86
3.2.4	PAR processes	86
3.2.5	PAR and PBL-participants empowerment.....	87
3.2.6	PAR as a source of practical solutions.....	87
3.2.7	A review of Critical Emancipatory Research (CER).....	88
3.3	RESEARCH DESIGN	93
3.3.1	The co-ordinating team.....	94
3.4	IMPLEMENTATION PLAN PROGRAMME	99
3.4.1	Evaluating the PBL strategy.....	100
3.5	ROLES AND RESPONSIBILITIES OF THE SAMPLE.....	101
3.5.1	The study co-ordinator	102
3.5.2	Student representatives.....	105
3.5.3	Curriculum developer of the faculty	106
3.5.4	Head of the Department.....	107
3.5.5	Lecturer	108
3.5.6	Community representative	109

3.6	DATA METHODOLOGY	109
3.6.1	Participants	110
3.6.2	Students	111
3.7	INSTRUMENTATION	112
3.7.1	Review and analysis of documents	112
3.7.2	Semi-structured focus group interviews.....	113
3.7.3	Focus group discussions.....	114
3.7.4	Questionnaires.....	115
3.7.5	Classroom observations.....	116
3.8	DATA ANALYSIS	118
3.8.1	Analysis of the qualitative data.....	119
3.8.2	Critical Discourse Analysis (CDA).....	119
3.8.3	Thematic content analysis	125
3.8.4	Narrative analysis.....	126
3.8.5	Statistical descriptive analysis.....	127
3.9	ETHICAL CONSIDERATIONS	128
3.9.1	Permission to conduct the study	128
3.9.2	Principle of Right to Privacy and Confidentiality.....	128
3.9.3	Principle of Integrity.....	129
3.9.4	Principle of Respect and Dignity	129
3.10	SUMMARY	129
4	CHAPTER 4: FINDINGS AND DISCUSSION OF RESULTS.....	131
4.1	INTRODUCTION	131
4.2	NARRATION OF CLASS ACTIVITY	132
4.2.1	Group 1 PBL Exercise	132
4.2.2	Group 3 Presentation.....	133
4.2.3	Group 4 Presentation.....	134
4.2.4	Group 5 Presentation.....	135
4.2.5	Group 2 Presentation.....	136
4.3	DATA ANALYSIS BY OBJECTIVE.....	138
4.3.1	Justification of PBL implementation	138
4.3.2	Components of the proposed PBL strategy	146
4.3.3	Situations that nurture the successful application of PBL.....	155

4.3.4	Challenges associated with PBL adoption.....	162
4.3.5	PBL in relation to a Sustainable Learning Environment.....	168
4.3.6	Identification of success indicators.....	177
4.3.7	Student perceptions of PBL participation.....	183
4.3.8	Findings by way of SWOT analysis.....	189
4.3.8.1	Strengths.....	190
4.3.8.2	Weaknesses.....	190
4.3.8.3	Opportunities.....	191
4.3.8.4	Threats.....	191
4.4	CONCLUSION OF FINDINGS.....	192
CHAPTER 5: CONCLUSION AND RECOMMENDATIONS.....		193
5.1	INTRODUCTION.....	193
5.2	THEORETICAL FRAMEWORK.....	194
5.2.1	PBL Implementation.....	195
5.2.2	Sustainable Learning Environments (SLE).....	196
5.3	PROBLEM STATEMENT.....	197
5.4	RESEARCH QUESTION.....	197
5.5	CONCLUSION ON THE PRIMARY RESEARCH.....	198
5.5.1	Justification of PBL implementation.....	198
5.5.2	Components of PBL.....	199
5.5.3	Conditions that foster the successful implementation of PBL.....	200
5.5.4	Challenges and the risks that may affect the successful implementation of PBL.....	200
5.5.5	PBL student behaviours that are important in a Sustainable Learning Environment.....	201
5.5.6	Indicators of a successful PBL strategy.....	201
5.5.7	Perceptions of students on PBL activities.....	202
5.6	PROPOSED PBL IMPLEMENTATION FRAMEWORK.....	205
5.6.1	Organisational factors.....	206
5.6.2	Student experience factors.....	207
5.6.3	Group participation experiences and perceptions.....	208
5.6.4	Personality issues (extroverts versus introverts).....	208
5.6.5	Levels of understanding of the programme.....	208
5.6.6	Educational and systemic factors.....	209
5.6.7	Final PBL 9-Step Framework.....	210

5.7	RECOMMENDATIONS.....	214
5.7.1	Neutralise resistance through education.....	215
5.7.2	Gradual and phased implementation	215
5.7.3	Start at the beginning	215
5.7.4	Benefit from hybrid systems.....	216
5.7.5	Capacitate students for PBL.....	216
5.7.6	Develop an effective PBL assessment plan.....	217
5.7.7	PBL implementation as part of institutional strategy.....	217
5.8	CONCLUSION ON LITERATURE REVIEW	217
5.8.1	Objective 1: To justify the necessity for implementation of PBL.....	218
5.8.2	Objective 2: Description of components of the proposed PBL strategy.....	219
5.8.3	Objective 3: Challenges and risks that may affect the successful implementation of this framework.....	220
5.8.4	Objective 4: Conditions that foster successful implementation of PBL.....	221
5.8.5	Student behaviours in an SLE that are important in PBL.....	221
5.8.7	Objective 6: Indicators of a successful PBL strategy	222
5.8.8	Objective 7: Students' perceptions of PBL.....	223
5.9	LIMITATIONS OF THE STUDY.....	224
5.10	RECOMMENDATIONS FOR FUTURE RESEARCH	224
5.10.1	Factors affecting student behaviour in group work exercises.....	225
5.10.2	The effective integration of PBL with other learning and teaching methods.....	225
5.10.3	Student and lecturer perceptions of the SLE	225
5.10.4	Quantitative methods in assessing and evaluating the successes of a PBL strategy.....	226
5.11	CONCLUSION.....	226
5	REFERENCES	228
6	APPENDICES	240

LIST OF TABLES

Table 1: PBL characteristics/features.....	28
Table 2: PBL and TDL differences	34
Table 3: Data analysis types	127
Table 4: Group observations summary	151

LIST OF FIGURES

Figure 1: Argumentation in relation to PBL.....	2
Figure 2: PBL in relation to other Work-Integrated Learning methods	7
Figure 3: PBL Context in the study.....	13
Figure 4: The Triad Whole.....	25
Figure 5: Three focus points of PBL.....	29
Figure 6: Model 1 PBL as a sub-set of TDL – Integrated TDL.....	30
Figure 7: Model 2 TDL as a sub-set of PBL	31
Figure 8: Integrated PBL	31
Figure 9: PBL and TDL – Independent yet integrated	32
Figure 10: Stand-alone PBL and Stand-alone TDL	33
Figure 11: Jones et al.'s Phases in Case Study Learning	56
Figure 12: Barret's Phases in PBL Case Learning	57
Figure 13: 3C3R PBL Problem Design Model	58
Figure 14: Nieuwenhuis' social justice in education framework.....	75
Figure 15: Education and Transformation	79
Figure 16: Research Methodology Outline	83
Figure 17: Study participants.....	102
Figure 18: Critical Discourse Analysis Levels.....	122
Figure 19: Thematic Content Analysis Structure	125
Figure 20: A snapshot of group 2's PowerPoint presentation of research results	149
Figure 21: A snapshot of group 4's presentation on areas covered	153
Figure 22: PBL class activity	184
Figure 23: Quality of Professional Knowledge Acquired.....	186
Figure 24: Preference of PBL learning	188
Figure 25: Proposed PBL Implementation Framework.....	210
Figure 26: Integrated PBL for implementation at TUT	213

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

CAPS:	Curriculum and Assessment Policy Statement
TUT:	Tshwane University of Technology
TDL:	Traditional Didactic Learning
DoE:	Department of Education
HE:	Higher Education
SA:	South Africa
T&L:	Teaching and Learning
NQF:	National Qualifications Framework
OECD:	Organisation for Economic Co-operation and Development
PBL:	Problem-Based Learning
TUT:	Tshwane University of Technology

CHAPTER 1: INTRODUCTION TO THE STUDY

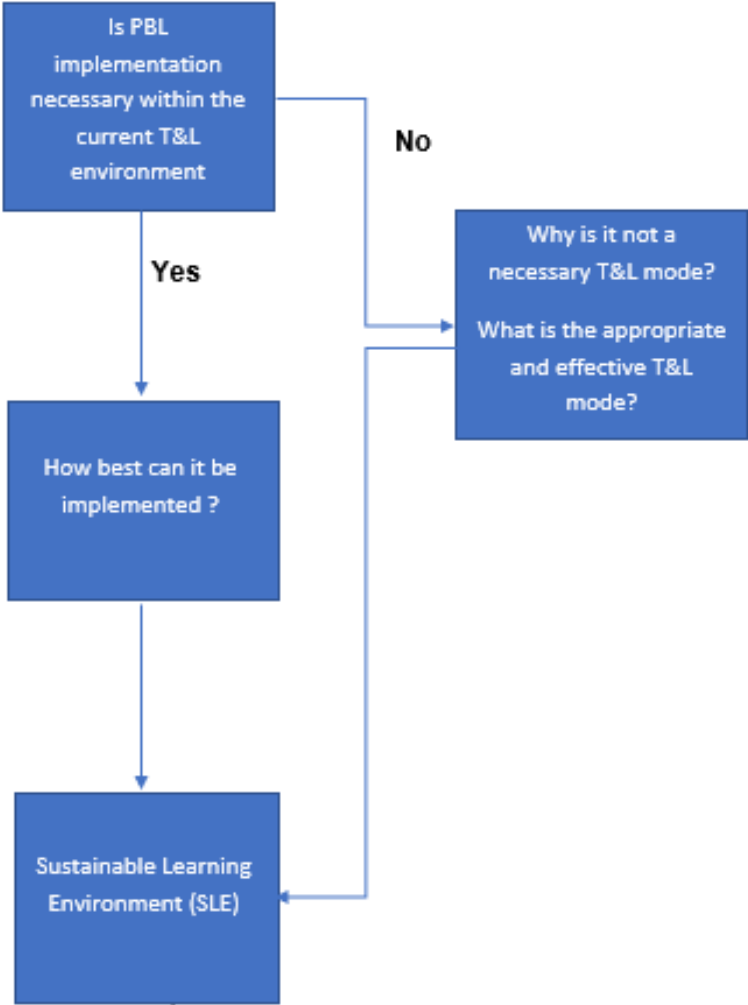
1.1 INTRODUCTION

Problem-Based Learning is a pedagogical methodology that seeks to develop competent, self-directed, independent-thinking, solution-oriented and pragmatic students through the use of methods that involve practical problem solving as part of daily learning (King & Boshuizen, 2005:65). In PBL, students deal with practical problems that resemble reality and require research and analytical application as part of solution-generation (Simone, 2014:17). It is a direct challenge to the conventional teaching methods that are centred on the instructor who directs the theoretical learning process involving minimum student participation. The characteristics of PBL are as follows: It focuses on the student, it is highly practical, it is problem-driven, it is solution-oriented, it is highly interactive and generally more appreciated by the student (De Graaf & Kolmos, 2003:657). Thus, students interact with other students, as well as with the instructor, in an effort to solve daily learning issues that are reflective of real-life situations. As a result, it produces a well-rounded individual, who has the capacity to fully meet the daily challenges of the social, economic and political aspects of life.

At an institutional level, a sustainable learning environment is a possible outcome of a successfully implemented PBL strategy (Zhou et al., 2013). This is an environment where students are able to contribute effectively towards development and social justice as a result of the optimisation of available learning resources and systems, or are able to “explore and exploit their potentialities to the fullest so that they can become contributing members of a democracy” (Mahlomaholo & Ambrosio, 2013:8). It is, therefore, important to understand the precepts, requirements, challenges and expectations of an effective PBL strategy, so that these can be applied as part of the transformative process to the conventional tertiary learning environment, into a sustainable learning environment. A sustainable learning environment’s benefits to South Africa cannot be underestimated, given the level of social and economic inequalities and the urgent need for social justice.

There have been many debates that have been recorded, regarding the best methods of teaching and learning (T&L), in the twenty-first century educational landscape (Pagander, 2014:8). These debates produce variances regarding the appropriateness and effectiveness of PBL as a T&L philosophy and methodology. Additionally, there are further debates on how PBL, itself, can best be implemented to achieve expected levels of effectiveness. This second-level of debate or critique is popular amongst proponents of PBL. Thus, two levels of argumentation can be identified in relation to the implementation of PBL, and these are further illustrated in the diagram below:

Figure 1: Argumentation in relation to PBL



Source: Researcher's own

Scholars have argued about the necessity and /or appropriateness of PBL as a teaching and learning (T&L) mode that can improve students' performance and capacity to pragmatically contribute to positive change. Some scholars have insisted that PBL is indeed necessary for this end, while others have argued otherwise. Those who have argued against PBL have proposed new T&L methodologies, or have reinforced the need to preserve current ones like the traditional learning or classroom-centred approach. Finally, those who have insisted on the introduction of PBL present different views or approaches on how to implement it, leading to another line of argument or debate. The existence of the multiple levels of argument, in the view of the researcher, necessitates institution-based field researches that will create a better understanding of PBL implementation, and its effects on these institutions. This study focuses mostly on this aspect – the processes, principles, stakeholders, philosophies and other entities that influence PBL implementation.

1.2 BACKGROUND TO THE STUDY

In 1994, South Africa became a democracy, ending the 45 years of Apartheid and over 100 years of political oppression and segregation of predominantly black persons. The end of Apartheid and the coming of democracy motivated a transformative stance in all areas of South African life with the core objective of ensuring that marginalised demographic groups were afforded opportunities that they were previously denied. The transformative process was guided by the Constitution of the Republic of South Africa of 1996, as well as its interim, which was in force between 1994 and 1996. Various legislative and administrative changes were required in higher education to ensure the quick assimilation of groups that had been disadvantaged by previous political dispensations.

In higher education, there was an immediate need to ensure the smooth accommodation of historically disadvantaged groups, as well as to come up with teaching and learning systems that reflected the democratic nature of South Africa, supported social justice, and

on top of that, were relevant to the economic needs of the country. Several new problems were encountered in the process. These included the failure of previously black educational systems to provide students who were able to effectively cope with university and tertiary learning. This was a result of the Apartheid educational system that intentionally prepared educated blacks for low and subservient roles. As a result of this objective of the pre-democracy educational systems, therefore, there was not much need to prepare the black, coloured and Asian races for intellectually challenging, senior roles that usually require one to pass through tertiary college.

At the same time, universities struggled to accommodate students from various backgrounds. With many universities and university faculties opening their gates to black students for the first time, a new challenge of meeting the diverse learning needs of the student body emerged. Most black students, for instance, came from poorly-funded schools, with ill-equipped and poorly-trained teachers. Furthermore, students from poor communities were exposed to different teaching and learning methodologies that were devised to cope with the resource challenges their schools faced. Most students were educated through traditional pedagogues where teachers were the centre of learning mainly as a response to resource challenges and, indeed, as a result of poor curriculum objectives, as mentioned earlier.

Between 1994 and the current date, many propositions, policies, programmes and bodies have been put across by various governmental and non-governmental stakeholders, with the need to address social justice issues, racial inequalities and university curriculum issues, in particular.

1.2.1 The Higher Education Act of 1997

Besides the constitution, this act is the most significant legal source on the role of universities in social, economic and political transformation (Che, 2004:4). The act, despite various amendments, remains centred on the need to create quality tertiary education programmes and institutions that can effectively serve the needs of South Africa. It also focuses on the need for inclusivity in education and the need for the

provision of adequate resources, amongst others. In relation to the PBL issue, which is the centre of discussion in this document, the Act, through its council discussed below, promotes the creation of teaching and learning modes that can address South Africa's higher education challenges, which include poor practicality, inequality and diversity management and resources (Che, 2004:4).

1.2.2 The Council on Higher Education (CHE)

The Council on Higher Education was established in terms of parliamentary law to provide advisory, evaluative and consultancy support to government. This council is important in the need for the transformation of the South African higher education sector into a sustainable learning environment, and this reflects very well in its goals (Che, 2004:3-6). These are to facilitate equitability in higher education access and to ensure adequate transformation to cater for the various demographic groups that now form part of the higher education value chain. The body is highly concerned with the need to develop higher education systems that positively contribute towards the development of all sectors of South African life (Che, 2004: 3-6; Hesa, 2014:2). Thus, PBL must theoretically meet the expectations of this body in terms of quality, inclusivity and practicability, for it to be a recognisable mode of learning.

Between 1994 and the present, several other institutional frameworks that touch on the quality of South African higher education graduates and social justice matters, can be identified. The National Plan for Higher Education and the White Paper for Higher Education, both related to the Higher Education Act, focused on both the need to improve the quality of tertiary institution graduates, their capacity to effectively contribute to national agenda and inclusivity and equality issues (Che, 2004:3-4, Hesa, 2014:1-2). These documents challenge universities to come up with teaching and learning (T&L) systems that will address the above targeted challenges and, to some extent, hint at the weaknesses of the current traditional pedagogy systems.

1.2.3 CHE and PBL processes:

The Council for Higher Education, in 2011, officially produced a document that acknowledged the need for PBL in South African universities. The council noted various problems that were noted amongst South African graduates. These included limited ability to apply theory learnt in school to practical situations in the workplace, limited ability to contribute to national development as is expected of educated and well-informed citizen, taking too long to develop the required industrial skills, and low capacity to solve problems. These challenges, according to CHE, reduced the employability of South African graduates. Malan, Ndhlovu and Englebrecht (2014:14) also feared that South Africa's global economic competitiveness was also being compromised by the aforementioned state of affairs.

The PBL was formally discussed in detail as one of the available solutions that academic institutions can harness to increase the practicality, relevancy and competitiveness of graduates (CHE, 2011:28). The Council for Higher Education, as shown in the table below, presents PBL as one of the four strategies that universities can apply to improve the quality of graduates.

Figure 2: PBL in relation to other Work-Integrated Learning methods

	Work-directed theoretical learning	Problem-based learning	Project-based learning	Workplace learning
Certificate	✓	✓ (short, focussed)	✗	✗ (time too short)
Advanced Certificate	✓	✓	✓ (short, focussed combined with PBL)	✗ (time usually too short)
Diploma	✓	✓	✓	✓ (short placements)
Bachelor	✓	✓	✓	✓ (short placements)
Advanced Diploma	✓	✓	✓	✓ (short placements)
Postgraduate Diploma	✓	✓	✓	✓ (short placements)
Professional Bachelor	✓	✓	✓	✓ (combined with PJBL)
Master's	✓	✓	✓	✓ (combined with PJBL)
Doctorate	✓	✓	✓	✓ (combined with PJBL)

Source: Council for Higher Education (2011)

The council discussed the implementation of PBL stating that it required change to teaching strategies, learning processes, infrastructural resources, curriculum, assessment of students and the interaction between academia and industry (CHE, 2011:27). PBL was suitable for basically all undergraduate and post-graduate programmes, with the exception of short courses. The council admits the need for PBL but, unfortunately, does not prescribe how universities can go about doing this, leaving an information gap that needs to be filled.

1.2.4 International Colloquium of the Sustainable Learning Environments

Matters relating to PBL and the establishment of the sustainable learning environment (SLE) have also been widely discussed in major symposiums that aimed at finding ways on how the South African HE system can be transformed to better serve the needs of a developing democracy (Monyooe, 2013:103-104). One important symposium was the International Colloquium of the Sustainable Learning, held in South Africa in 2013.

(Mahlomaholo, Nkoane and Ambrosio, 2013:8: i-x). While there are many other similar conferences, this particular one is important to this research because of its definition, focus and emphasis on an SLE that could emanate from PBL implementation, as well as other T&L systems (Monyooe, 2013:103). The symposium concluded that, social transformation, which was linked to economic and political development of South Africa, was not achievable without transforming the higher education environment and indeed the broader educational environment, such that it churns out graduates who can practically contribute to national change (Mahlomaholo, Nkoane and Ambrosio, 2013:8:i-x). This transformation was firstly on the levels of political transformation aimed at promoting inclusivity and equality and academic transformation, where students had the knowledge, experience and practical knowhow to effectively contribute to South African development – in other words, where students were able to integrate the practical and the theoretical experience they had towards the national good (Mahlomaholo, Nkoane and Ambrosio, 2013:8:i-x).

This study, therefore, takes place in a background of educational transformation, various regulations, laws and bodies that have been instituted to support such transformation, owing to identified historical and curricular circumstances. The study also takes place in an environment where PBL has been identified as a possible solution to current graduate quality issues, but where no detailed plan of action to implement it has been set. The research context below further discusses the study's background issues.

1.3 RESEARCH CONTEXT: TUT

This research is set within the higher education context, with specific reference to Tshwane University of Technology (TUT), History and Theory of Graphic Design and Contextual Studies course.

Tshwane University of Technology, has nine learning sites in different provinces across South Africa, namely, Gauteng, Mpumalanga, Limpopo, and has other small programmes in the Western Cape and KwaZulu-Natal. The institution boasts of over 55,000 students and an estimate of 2600 members of staff. Tshwane University of Technology offers both

undergraduate courses and postgraduate degree courses. In higher education, there are seven faculties, which has a further education focus on Engineering, Education, Management, Arts, and Sciences, to mention a few. A majority of students studying at Tshwane University of Technology are mostly from disadvantaged schools in the different parts of South Africa, and mostly from rural areas.

The History and Theory of Graphic Design and Contextual Studies course. This course falls under the Faculty of Arts. It is aimed at preparing students to understand and appreciate the graphical aspect of mass communication from its history, methodologies and outcomes (TUT, 2012:1-5). The importance of this course, to the outside world, is that it equips students with the capacity to effectively design communication methodologies and outputs that can effectively convey specific methods to the public. The major users of the graphical communication aspects, covered in the course, are the marketing and advertising industry, the mass-communication media industries, the ICT industry, amongst others. The applicability of the knowledge and skills that students are expected to develop from the course, cuts across the public and private sectors alike. The growing importance of graphic-based communications, in South Africa and the world, makes this course an important one to students and industry. This particular course was, however, used only as a motif in the need to appreciate PBL at TUT. The researcher was of the view that observations made of students from this course would, to some extent, be applicable to other students at the university.

Tshwane University of Technology, where the study is set, came into being in 2001 when the government, in consideration of the National Plan for Higher Education (NPHE) planned to reduce the number of tertiary institutions through consolidation. Technical colleges, also known as Technikons, were merged and converted into universities of technologies with Pretoria Technikon, Northern Gauteng Technikon and North West Technikon, being merged to form TUT (Lalla, 2009:1-4). TUT thus operates in Gauteng, Mpumalanga and Limpopo provinces, with its main campus in Pretoria. It has over 54 000 students across seven faculties and three provinces (TUT, 2016:8).

With regards to curriculum, TUT, as a former Technikon, maintains a strong technical skills development focus (Baloyi, 2009). The university runs a work-integrated learning programme (WIL) as part of its teaching and learning philosophy. This involves sending students to the world of work, as part of learning, in a bid to develop relevant skills and experience (TUT, 2016:35). WIL, like PBL is interested in ensuring that students will develop skills that are relevant to industry and make them more contributory to the practical world. WIL, however, appears to be centred on the need to create contacts between students and learners, so that, upon graduation, students will have better prospects of being employed. It does, however, mention the need to develop skills and facilitate better knowledge development amongst learners (TUT, 2016:1).

PBL, unlike WIL, however, focuses on the integration of all the learning aspects involved with problem-oriented learning. Students, under PBL, do not start attempting to integrate the theory they would have accumulated in class, with practice upon being engaged by an employer, as in the case of WIL. Rather, problem-orientation and integration of theory and practice under PBL, are part of everyday learning (Barret, 2004). All the same, it must be noted that the Council for Higher Education in South Africa, somehow, defines PBL as a subset or a part of WIL, though many scholars, like Barret (2004), do not necessarily agree.

1.4 PROBLEM STATEMENT

The South African higher education system is faced with various challenges relating to the manner, ability and capacity with which students assimilate knowledge. This study focuses on the challenges associated with the implementation of one of the commonly suggested solutions to higher educational cognitive challenges amongst students – Problem-Based Learning. As a proposed solution that has worked in various countries, PBL is supposed to be readily acceptable, apprehensible, and implementable within the South African sphere of higher education. However, the situation on the ground shows that higher education learning is still struggling to transform from the traditional, lecture-centred pedagogy to PBL, which is more learner-centred, oriented in problem solving,

transdisciplinary, heterogeneous and network-embedded than the former (Buswell, 2009).

The need and proposition transformation, from the traditional didactic learning (TDL) methods to a PBL mode, is motivated by various challenges that the latter method presents. This is because predominantly traditional schooling systems do not prepare learners for the self-directed learning, which is more constructive, and equips students with the capacity to deal with pragmatic situations (Cross, 2004: 227). In the views of Allan and Dory (2001), the conventional schooling system mode of teaching produces students who are passive, know little of the world around them, do not use higher-order thinking skills and are most likely to be disinterested in acquiring knowledge. Additionally, such learners are test-oriented and study towards examinations, rather than towards an understanding of phenomena. Such students are not geared to meet the needs of a democracy and to contribute towards social justice, community and national development. This is because the learning environment which they are part of is not a sustainable one, where they will be nurtured to become responsive citizens who will move their nation forward using the knowledge, expertise and skills they would have acquired from the academic system. This approach, which is supported by various scholars including Mahlomaholo, Nkoane & Ambrosio (2013:8) and Govender & Muthukrishna (2012:21), introduces the issue of how and whether the proposed PBL strategy can lead to the development of a sustainable learning environment, as an output.

The problem of a studentship that is not fully equipped for the practical rigours of the professional world, is not confined to South Africa. In Cameroon and Nigeria, conventional or traditional educational systems have failed to produce graduates who have the capacity to influence and direct development in the political, social and economic spheres of life (Tchombe, 2006: Sapieha, 2007). In the United Kingdom (UK), similar challenges with the traditional or conventional educational systems manifest themselves through lack of employability amongst qualified graduates (Gunn *et Al.*, 2010:330).

From the above assertions, it can be noted that two related problems exist. The first problem is the weakness of conventional, lecture-based learning systems in creating a student, who is both intellectually and technically empowered to deal with real-life

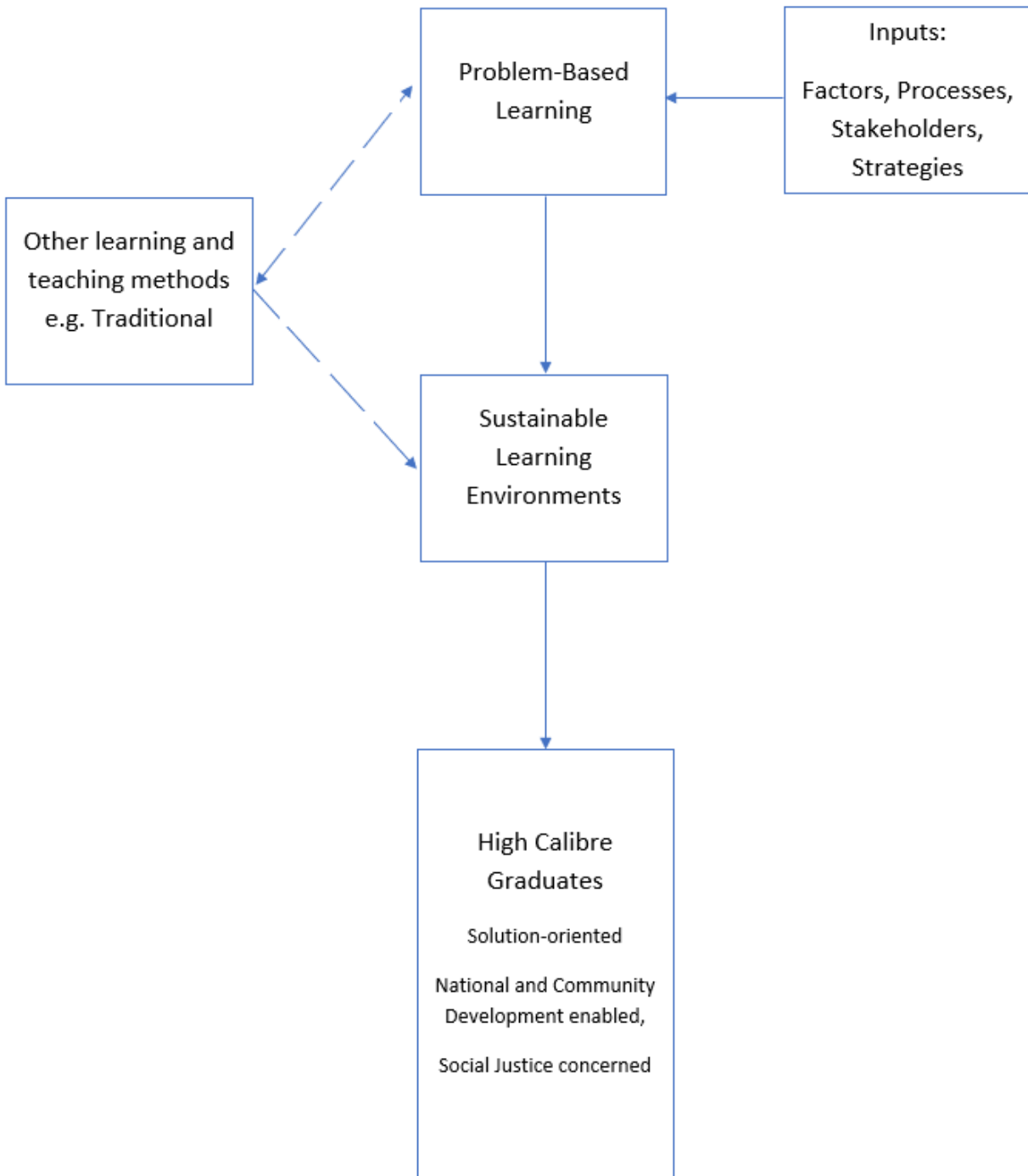
challenges. The second one relates to the challenges faced by institutions that have identified the first problem and are attempting to implement PBL as a solution. This problem motivates the researcher to study various methods, systems and processes that can be applied to ensure that PBL is effectively implemented as a solution to the status quo of higher education learning. The study focuses more on the second problem though it does not neglect the significance of the first problem. After all, PBL strategies that are of critical significance to this study are a consequence of the first problem. The study, therefore, makes an admittance that, while PBL has been identified as a solution to the above-mentioned student development challenges, this alone does not solve the problem. PBL needs to be effectively implemented if it is to be of real value to tertiary institutions, students and society at large, i.e. if it is to create a sustainable learning environment.

1.5 AIM OF THE STUDY

The study aims to provide strategic and operational solutions on how to effectively implement Problem-Based Learning strategies, as a solution to the challenges associated with conventional pedagogy. It involves a search for a framework through which PBL can be effectively implemented to enhance sustainable learning environment at Tshwane University of Technology that underpins the main concern raised in this research. The solution is expected, amongst other things to help transform the current higher education environment into a sustainable learning environment (SLE) where students' potential can be fully realised, so that, in the end, they become fully functional citizens who can positively contribute to social justice, equality and nation-building.

The diagram below summarises the aims of the study, i.e. an understanding of how PBL can improve the outcomes of current educational systems in tertiary institutions, creating a sustainable learning environment in the process.

Figure 3: PBL Context in the study



Source: Researcher's own, using ideas from Mahlomaholo & Ambrosio (2013), Govender & Muthukrishna (2012) and Barret (2005).

The study is, therefore, concerned with the factors, processes, stakeholders and strategies that are necessary in the development of a PBL strategy. A PBL strategy, once implemented, was hypothesised to result in an SLE that developed learners with high competences in providing real-world solutions and contributing towards the social justice and developmental needs of a democracy. At the same time, it was critical to assess how other teaching and learning strategies interacted with PBL, to produce the same sustainable learning environment.

1.6 RESEARCH OBJECTIVES

In line with the above aims, the objectives of the study are:

- To justify the need for the implementation of problem-based learning.
- To describe the components of the proposed problem-based learning strategy.
- To highlight the challenges associated with the adoption of a problem-based learning strategy.
- To investigate the conditions that foster the successful implementation of problem-based learning.
- To anticipate the risks that may affect the implementation of this framework and suggest ways of circumventing these.
- To study PBL benefits that are important in a Sustainable Learning Environment.
- To identify the indicators of a successful problem-based learning strategy.

These objectives will be explored through addressing the broad research questions in the next subsection.

1.7 RESEARCH QUESTIONS

The key question in this study (*How to implement problem-based learning to support a sustainable learning environment at a higher education institution?*) was broken down

into seven broad research questions, from which data was gathered. These questions were as follows:

- What is the justification for the need for the implementation of problem-based learning?
- What are the components of the proposed problem-based learning strategy?
- What are the conditions that foster the successful implementation of problem-based learning?
- What are the challenges and the risks that may affect the successful implementation of this framework?
- What are the risks that may affect the implementation of this framework and what are the suggest methods of circumventing these?
- Which PBL student behaviours are important in a Sustainable Learning Environment?
- What are the indicators of a successful problem-based learning strategy?

The above-mentioned questions guided the development of the methodological processes, briefly described in the following section.

1.8 METHODOLOGY

The study was based on a Participative Action Research (PAR) approach. PAR is an investigative technique, characteristically related to institutional self-evaluation, in which the research participants are engaged with the professional analysts throughout the investigative process, from the beginning planning phase to the ultimate presentation phase, where their views and experiences are expressed (Danley & Ellison 1999:1). In Mouton's view (2001:150), PAR lies within the Critical Emancipatory Research (CER) paradigm, which is strongly aligned with qualitative studies.

A case study design was adopted and a sample of thirty-three students from the History and Theory of Graphic Design and Contextual Studies course, at the Tshwane University of Technology (TUT), was used in the study. This course falls within the Faculty of Arts.

The use of this design facilitated depth in the data collected, and the probing of key issues added a richer texture to it.

The researcher, as per the precepts of PAR, participated in a one-month study exercise that was conducted using the principles and methods advocated in PBL learning. Students were divided into five groups, given a real-world problem, which they had to solve practically. Their problem was the need to appreciate whether consumers understood hidden graphical messages in commercial advertisements. The researcher observed the presentations of the students' solutions to this problem. The lecturer in the study took the role of a facilitator, speaking less and providing students with a few necessary tips.

Within the TUT case, observation and focus group interviews were applied as the main data collection mode. A semi-structured interview juxtaposed with a structured questionnaire were also used for evaluating student experiences and views, after the completion of the cases.

The researcher relied on observation, thematic content analysis, critical discourse analysis, SWOT analysis and narrative analysis, as data analysis methods. To analyse the results from the short structured questionnaire to rate students' experience with the PBL processes they went through, descriptive statistical analysis was used, – specifically frequency analysis, where the response frequencies of the students were tallied.

Willig's (2001:18) set of basic ethical considerations for professional codes of practice was used, which included informed consent, no deception, right to withdraw, debriefing, and confidentiality, all of which were applied in the study.

1.9 CLARIFICATION OF TERMS

Below is a brief explanation of the key terms used in this document.

1.9.1 Problem-Based learning

PBL is a problem-solving oriented, practical learning and teaching methodology that is usually co-ordinated in groups (Barret, 2004; Barrow, 1996). It is student-centered, rather than educator-centred, and also relates learning to the personal experiences of learners (Saarinen-Rahiika *et al.*, 2008; Barret, 2004; Barrow, 1996).

1.9.2 Pedagogy

Pedagogy, as used in this study, refers to the relationship between teaching and learning, and how this relationship leads to growth, development and understanding of knowledge (Loughran, 2006:1031). It is influenced by political, social and cultural values (Gray, 2009) and requires a reciprocal relationship between the 'teacher' and the 'student/learner'.

1.9.3 Traditional didactic learning (TDL)

This is the commonly-practiced mode of teaching and learning, where the educator prepares and transfers knowledge to students (Larsson, 2001:2-3). Students rely on the educator to provide them with information and solutions to learning problems. This method is what is mostly practiced in South Africa higher education institutions (CHE, 2004:12-16). In this document and in the literature, it is also referred to as traditional learning, lecturer-centred learning or conventional learning.

1.9.4 Sustainable learning environment

A sustainable learning environment is one in which students have the capacity and ability to fully realise and exploit their potential, so that they can positively contribute to the needs of a democracy (Mahlomaholo & Ambrosio, 2013:8). These needs include enabling national development, reducing inequality, eradicating poverty and unemployment (Mahlomaholo & Ambrosio, 2013:8). In short, an SLE churns out students who have a positive impact on social justice. In agreement, Govender and Muthukrishna (2012:21) assert that, in an SLE, students develop into complete beings with strong knowledge and a quest for social justice. This is only possible through changes of academic curricula,

such that it is focused on developing attitudes and perceptions of “social justice, human rights and social change”.

1.10 STRUCTURE OF THE THESIS

This introductory chapter discusses the formulation of the research problem, clearly providing the background, the context and outlining the aims of the research. The main and supporting research questions are outlined. A brief description of the methodological orientations is provided. The clarification of terms particular to this study is presented and the chapter ends with an overview of the thesis. The next four chapters have been arranged as follows:

1.10.1 Chapter 2: Theoretical framework and literature review

The purpose of this chapter is twofold. Firstly, it discusses the conceptual underpinnings which frame this study. This study is placed within a critical emancipation research (CER) paradigm, drawing on the work of Paulo Freire, who is arguably the most celebrated critical educator (Nouri & Sajjadi, 2014: 76-78). Freire’s promotion of students’ abilities to think critically about their educational situations, and his notion of engaged pedagogy, giving the responsibility of learning to both educators and learners, as discussed by Nouri and Sajjadi (2014: 76-78) has influenced the course of this study.

The second aspect, in this chapter, reviews the literature relevant to this study. While looking at the quality of education delivered, one has to consider how teachers are trained to deliver this education. The literature focus has, therefore, been on the professional knowledge of teachers, the pedagogical practices applied, and how these determine the quality of education in South Africa.

1.10.2 Chapter 3: Methodology

This chapter outlines the methodology, the design, and the implementation of the research process that has been employed. A qualitative approach is used and the researcher provides, herein, a rationale for the research process chosen for this study.

1.10.3 Chapter 4: Findings and discussion: Implementation of Problem-Based Learning

Chapter 4 presented the findings from the data collection exercise that was conducted through observation and focus group discussions. The data was presented by objectives.

1.10.4 Chapter 5: Conclusions and recommendations

This chapter concluded the study. It presents conclusions to findings made from the literature reviews, and findings made from the primary data collection process. It also gives various recommendations for the implementation of PBL, and a framework through which effective implementation can be conducted.

2 CHAPTER TWO: THEORETICAL FRAMEWORK AND LITERATURE REVIEW OF PBL

2.1 INTRODUCTION

Chapter discusses the theoretical frameworks of the study and also reviews various sources that are related to the research's subject matter. These are problem-based learning (PBL), traditional didactic learning (TDL) and sustainable learning environments (SLE). Various South African and international sources were consulted in the production of this chapter which mostly relied on published journals. Textbooks, research articles and policy documents were also consulted in varying, but lesser degrees.

2.2 THE HISTORY OF PBL

Various scholars trace the origins of PBL to different places and periods in history. According to Clandfield & Sivell (1990) and Mme (2011:1), PBL can be traced to France in 1920. Celestin Frienet, a First World War combatant and educationist, upon returning from the war, discovered that he was no longer capable of keeping up with the physical strain of traditional teaching processes. As a solution, he came up with a system that involved learners playing a central role in class, which included making presentations, group discussions and case studies. Learners did most of the talking and directly drove the learning process. In the 1960s, other schools followed suit and introduced processes where learners were both physically and orally participative in class because of the noted benefits that included enhanced communication skills and self-confidence among learners (Mme, 2011:1).

In the views of Tan (2005), however, PBL can be traced to the McMaster's Medical School in Canada. The instructors at the institution noticed that students performed very well in acquiring relevant medical knowledge, but they had no ability to fully utilise this knowledge. In response, the instructors developed an instructional process that would compel students to utilise their textbook knowledge in case study scenarios. Students

could view real-life scenarios (cases) and instructors could assess the students' abilities to sufficiently convert theoretical knowledge into actions that produced the desired solutions. While Mme (2011:1), acknowledges that the McMaster's Medical School played an important part in the introduction of PBL, the author believes credit for it lies with Frienet, the French educationist. From North America in 1969, the next recorded institution to have introduced PBL was the Medical School of the University of Maastricht, in 1974 (De Graaf & Kolmos, 2003:658). From there, several European medical institutions adopted the approach in teaching medical personnel. By the 1980s, PBL was the accepted standard of medical staff training, in Europe and North America, adopted by almost all medical training universities (De Graaf & Kolmos, 2003:658).

In South Africa, PBL permeated the educational sector through benchmarking and active learning from European and American universities. PBL, because of its noted benefits in the medical sector, spread to other disciplines as well. These include engineering, law, theology and education (Alalmi, 2014). In 2011, the Council for Higher Education (CHE), South Africa, presented PBL as an important aspect of work-integrated learning (WIL) and encouraged its use in tertiary institutions across all possible disciplines. The CHE, in its publication, also formalised PBL, clarifying the concepts it should encompass from a South African perspective (CHE, 2011:84). *The Higher Education Monitor 12: Work-Integrated Learning: Good Practice Guide*, by the council, thus provided a much more detailed framework of what constitutes PBL, indicating growing support for this mode of T&L.

2.3 THEORETICAL FRAMEWORK

This section presents the theoretical framework of the study. Various scholars have defined theoretical framework in a number of ways. These definitions include the one by Adom, Hussein and Agyem (2018), that it is a research guide that is based on the body of existing theories within a field of study. Brondizio, Leemans, and Solecki (2014) view it as a specific theory, or compilation of theories, that are of significance in the study. This study visits educational development and learning theories to present a more profound understanding of PB, learning and sustainable learning environment.

2.3.1 PBL within the Constructivist way of thinking

Learning constructivism, as a theory in knowledge development, states that students “construct” knowledge through the learning process, in which they are the main participants. The role of educators in this process is to facilitate the acquisition of knowledge and to simply guide the process (Jia, 2010:197). Additionally, Jia (2010:197) states that the uncertain nature of knowledge requires each student to spearhead their own initiatives of constructing knowledge.

The origins of constructivism as a learning theory can be traced back to the days of Socrates (Jia, 2010:197). However, the modern forms of the theory can be traced to the 1929 work of John Dewey, titled *The Uncertainty of Knowledge* (Bada, 2015:66). It has, however, been modified and revised by various other scholars over time (Bada, 2015:66).

In the views of Bada (2015:66), Jia (2010:197) and the learning constructivism theory can be parsed into the following major conceptions:

- Knowledge is continuously being created, and each student is part of this process. Knowledge is, therefore, never certain as new views, assumptions, experiences and interactions continuously create new knowledge. Furthermore, what was deemed to be knowledge in the past can suddenly be turned down as a fallacy.
- Every student creates their own knowledge, based on various experiences, background and interests. With knowledge being subjective to its constructor, the student is the principal component in the learning and teaching process.
- The role of the educator is not to create knowledge. Rather, the educator stands in to support students in their quest for knowledge creation. Dialogue between the teacher and the student is critical in constructivism, rather than the instructor-instructed relationship in traditional learning setups.

Various commentaries have been made in relation to the above assumptions. Amongst the most comprehensive of these is Honebein's (1998) seven teaching points, that guide constructivism. These are as follows:

- i. Students are the determinants of what they should learn.
- ii. Learning must seek to provide alternative solutions for problems – these resonating to the differences in students' knowledge.
- iii. Learning must be realistic and must incorporate practical tasks.
- iv. Students must be encouraged to take charge of the learning and knowledge development process.
- v. Learning and knowledge generation is a social process and, therefore, requires collaboration among students and educators.
- vi. Learning must apply several methods of representation. in addition to ordinary textbook modes.
- vii. Students must be aware of their role in knowledge construction.

The above-mentioned theoretical foundations have been critical in the development of PBL environments. Similarities of thought can be seen between the views of PBL authorities and learning constructivists. These are the emancipation of the student as the centre of learning (Buswell, 2009:623); emphasis on the practicality of learning and knowledge development (Simone, 2014:17; Buswell, 2009:623); collaborative approaches to knowledge acquisition. These will be discussed in detail in a later section.

Within the constructivist learning world, students utilise language to build sense of the surrounding world. Dochy *et al* (2001:533) mentions that PBL offers numerous chances for students to apply conceptual components such as domain knowledge and language in learning. Sufficient practice of language is important for being a part of a practitioner's community – a community that shares interests, ideas and goals to resolve common issues. Through discussion, participants have an opportunity to manipulate newly gained vocabulary, interact with other community members and negotiate meanings of words.

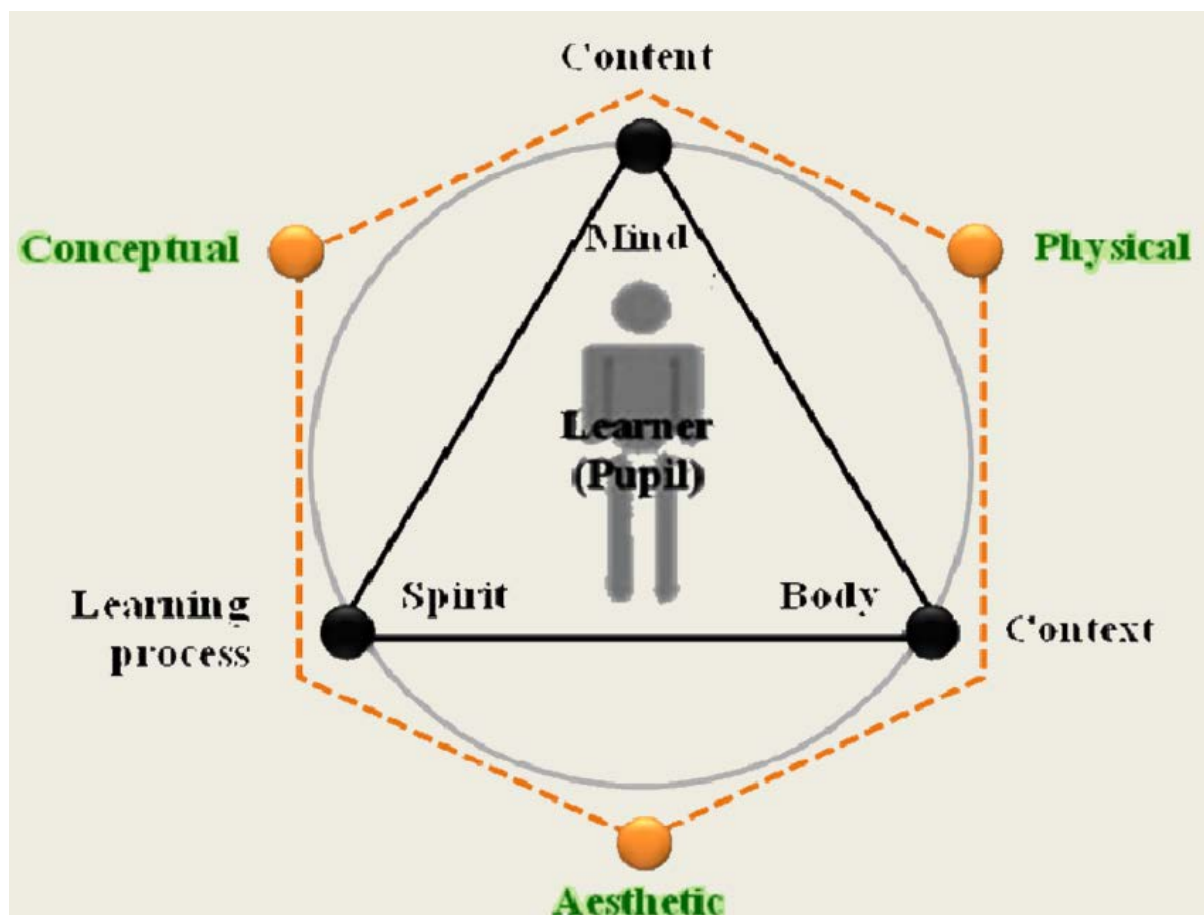
2.3.2 Sustainable learning environment

The concept of a sustainable learning environment (SLE) is widely discussed in the literature, especially writings whose themes centre around education and development. SLE, as a concept, is important in this study, as it falls along a chain of outcomes that PBL is hypothesised to bring. SLE has been defined differently by various scholars and institutions. Within the South African context, *The 5th Sustainable Learning Environments Colloquium*, held in 2013, was important in the development of the definition of SLE. The definition states that an SLE is one wherein students have the capacity and ability to fully realise and exploit their potential, so that they can positively contribute to the needs of a democracy (Mahlomaholo & Ambrosio, 2013:8). These needs include enabling national development, reducing inequality, eradicating poverty and unemployment (Mahlomaholo & Ambrosio, 2013:8). In short, an SLE churns out students who have a positive impact on social justice. In agreement, Govender and Muthukrishna (2012:21) assert that, in an SLE, students develop into complete beings with strong knowledge and a quest for social justice. This is only possible through changes of academic curricula, such that it is focused on developing attitudes and perceptions of “social justice, human rights and social change”.

Sustainable learning environments have also been looked at from an external perspective that is concerned with defining the physical constituents of educational facilities. For instance, Stallman (2010:835) views SLE as the physical component of an educational facility’s setup that is designed in adherence to environmental management principles, particularly to conserve the natural environment, while, at the same time, creating optimal enjoyment, health and security for students, teachers and other stakeholders. This view is also shared by the OECD (2014), who defines an SLE in the context of resources and the natural environment. In this type of SLE, schools and academic facilities are constructed with the need to optimise on space, geography and demographics. Other terms that have been used to describe such environments include “Modern Learning Environment” – Osborne (2013:3). In such an environment, learners can expect comfort, flexibility and enhanced access to resources.

As if to present a compromise of the two broad views on SLE above, Elseragy, Elnokaly & Gabr (2011:456) offer the view that social justice, equality and the development of responsible citizens through education, cannot be divorced from the physical environment of learning. A physically or naturally sustainable learning environment, where the student feels comfortable and inspired, is most likely to churn out students with capacities and abilities to address social inequalities and to positively contribute towards, responsible community and nation-building. Elseragy, Elnokaly and Gabr came up with a model they termed the Triad Whole, to describe this relationship.

Figure 4: The Triad Whole



Source: Elseragy, Elnokaly and Gabr (2011:456)

To summarily explain, the student is at the centre of learning within an SLE. The SLE supports a learning process that nourishes a student's body, mind and soul within both a physical context (built environment, natural and physical resources) and the conceptual context (social justice, developmental concern and community-building). The model thus links the definition of SLE, related to the physical environment, with the conceptual definition of the same. Clark (2002:8) partially agrees with the views above, that an effective learning environment has both a conceptual aspect (what the student learns) and a contextual aspect (the physical environment where they learn it from).

It is imperative to clarify that the differences in the definition of SLE, as shown above, do not necessarily indicate a conflict of views on SLE as a subject matter. Rather, these differences appear to arise from the fact that the term Sustainable Learning Environment has been used differently by two different schools of thought, to refer to two different things.

2.4 DEFINITIONS OF PBL AND SLE

This sections briefly defines the major concepts that this research is centred on, i.e. PBL and SLE. It also explains these concepts before presenting relational frameworks between PBL and TDL.

2.4.1 Problem-Based Learning

PBL involves challenging students with issues to offer a learning stimulus. The important delineating feature of PBL is that teaching and learning focuses on the resolution of real-life problems or cases by students (Savin-Baden, 2000:10). According to Jeffries and Huggett (2010:71), PBL can, therefore, be described as an instructional process that utilises reality, as presented in problems and cases, as a context for students to gain knowledge about intellectual concepts. PBL commonly involves group learning in which the lecturer serves as a facilitator. The role of facilitator is to assure that the PBL process is carried out in time and on schedule, but the actual knowledge transfer processes are generally left to the students themselves.

Barell (2006:11) refers to Problem-Based Learning as a process of inquiry that solves doubts, questions, uncertainties and curiosities about composite life or phenomena more effectively than traditional learning processes. A problem is any difficulty, uncertainty or difficulty that requires or invites a certain type of resolution. The inquiry of the student is very much an essential part of PBL and resolution of problem. PBL is presented as a way of challenging students to be more involved in the knowledge development, acquisition and transfer quest. This is facilitated by their personal involvement in the search for responses to their own queries and curiosities and not just responses to queries posed by a teacher or textbook.

Chirimbana (2014:248) cites the works of Barrows (1996) and Barret (2004) in further explaining the basis of PBL. In Barrows' views, PBL puts the learner, as the key stakeholder, in knowledge development and transfer. In Barret's view, as commented by Chirimbana (2014:248), PBL focuses on adapting to the changing needs of the professional environment, particularly intensifying the expectation that graduates must be able to effectively resolve work environment challenges.

The table below summarises the key words in the cited definitions of PBL.

Table 1: PBL characteristics/features

	Saarinen-Rahiika <i>et al.</i> , (2008).	Wadhwa (2005)	Barret (2004)	Barrow (1996)	Barell (2006)	Chirimbana (2014)	Tiwari (2008)	Azer (2005)
Problem-solving	x	x	x	x	x	x	x	x
Practical learning	x	x	x	x	x	x	x	x
Group-coordinated learnership	x							x
Learner-centred teaching and learning	x	x	x	x	x	x	x	x
Research or inquiry-based learnership			x	x	x		x	x
Personal experience-related learning								x

Source: compiled by author from sources cited in the table

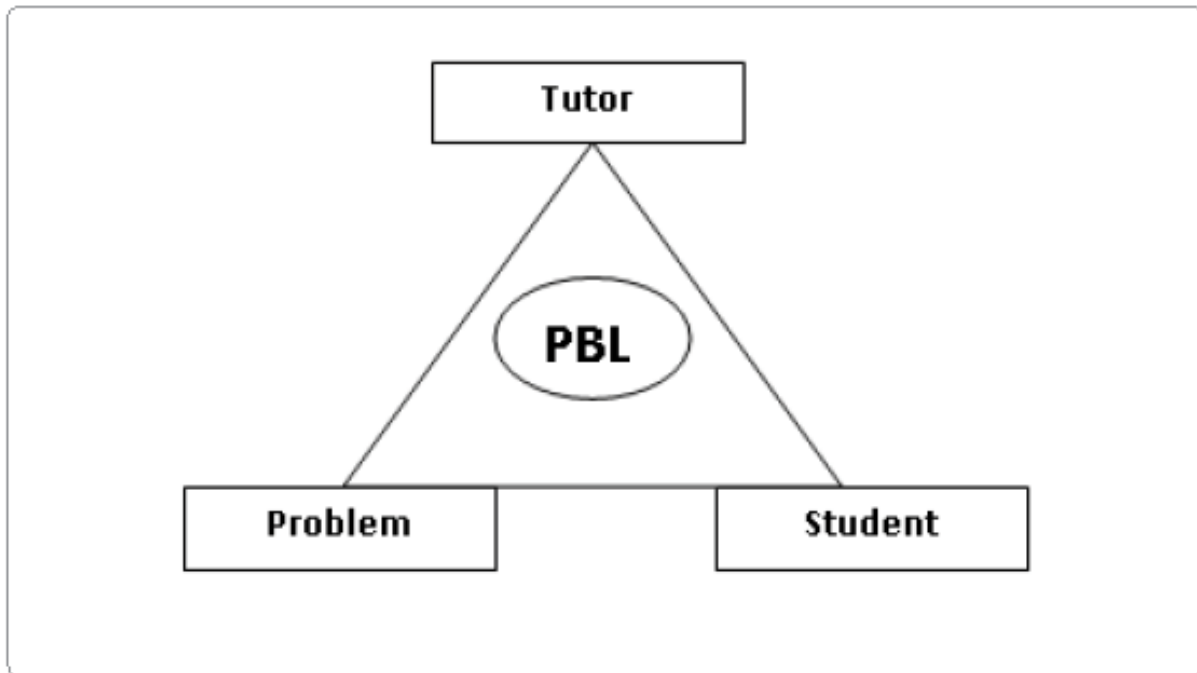
From the above definitions and summary table, it can be concluded that scholars associate PBL with the following:

- Problem-solving
- Practical learning
- Group-co-ordinated learnership
- Learner-centred teaching and learning
- Research or inquiry-based learnership
- Personal experience-related learning

The most common precepts of PBL from the above definitions, however, are inquiry-based learning, learner-centred and practical teaching.

In the views of El Nagger *et al.* (2013:1), regardless of the many facets or aspects of PBL discussed above, PBL is hinged upon three elements: the tutor or facilitator, the problem and the student. They present a diagram they termed the three angles view, shown below:

Figure 5: Three focus points of PBL



Source: El Nagger *et al.* 2013:

They do not necessarily dispute the existence or importance of the other PBL facets, but simply hold the view that the three above are the most deterministic of them all.

2.5 PBL VERSUS TRADITIONAL DIDACTIC TEACHING METHOD

PBL and TDL, also referred to as conventional pedagogy, traditional pedagogy and lecturer-centred learning in this document have different types of operational and content relationships. This subsection explains and discusses some of the commonly discussed relational frameworks (integration options) between the two approaches.

2.5.1 PBL as a complete unit of TDL (integrated traditional approach)

McCarthy (2010:224) and McFalls (2013:127) discuss how a PBL approach can be a part of a traditional learning setup in higher education learning scenarios. McCarthy (2010:224) conducted a study on integrating PBL with traditional learning, in teaching English as a second language to Japanese university students. The conclusions from her study were that PBL can indeed improve students' understanding and appreciation of language, and can be assimilated into traditional learning systems in the process. The views by McCarthy point towards the simplistic model below, presented in this document as Model 1:

Figure 6: Model 1 PBL as a sub-set of TDL – Integrated TDL



Source: Developed by researcher, applying views by McCarthy (2010:224) and McFalls (2013:127).

In the above mini-model, PBL is implemented as part of or as a subset of traditional didactic approaches. Due to the fact that this model presents a primarily didactic approach, that has included a PBL approach in some of its aspect, Gustin *et al.* (2008:3), term it the Integrated Traditional model, i.e. a model where TDL encapsulates or encompasses a small proportion of PBL.

In the above model, students integrated PBL with TDL, as lecturers adopt whichever approach is most suitable for the teaching and learning of a particular area of interest. McFalls (2010:127) asserts that such an integration, as proven in an experiment for

testing PBL integration with TDL in patient self-care technology lessons, works very well, enabling students to achieve both the theoretical knowhow, strong technological appreciation and operation skills. McCarthy (2010:242) further concludes that low acceptance of PBL by some students, who, despite being exposed to the autonomous learning advantage of PBL, still preferred TDL, also made an integrated curriculum more appealing as it was able to balance out student preferences. Gustin *et al.* (2008:6) also confirm that the integrated model also supports the strong conceptual appreciation within practical setups and was, in some instances, as good as stand-alone PBL.

2.5.2 TDL as a complete unit of PBL (Integrated PBL approach)

TDL can also be integrated as a minor part of a PBL curriculum. Under this arrangement, PBL is set as the major instruction procedure which, however, incorporates TDL in some parts of the curriculum, especially those of a high content nature (Gustin *et al.* 2008:3). Gustin *et al.* (2008:3) classify this approach as the integrated PBL model.

Figure 7: Model 2 TDL as a sub-set of PBL

Figure 8: Integrated PBL

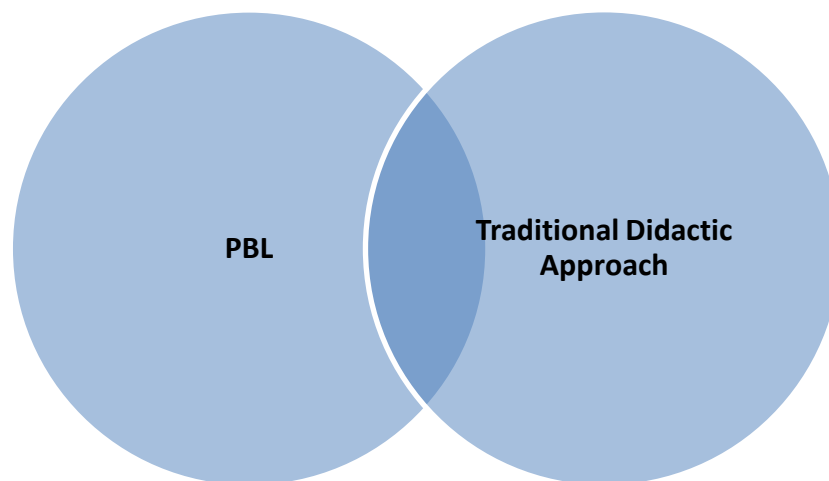
Source: Developed by researcher applying views Gustin *et al.* (2008:11)

Gustin *et al.* (2008:11) were able to rank the effectiveness of integrated PBL, stand-alone TDL and integrated TDL in the development of deep learning capacities, i.e. detailed research and application of content in university students. Both integrated PBL and integrated TDL supported the development of the tested skills better than stand-alone TDL. In their experiment, Integrated PBL, however, outperformed integrated TDL in the development of the same deep research and content application skills. Similarly, Aldamegh and Baig (2005:605) discovered that students' abilities to remember learnt concepts were enhanced when the integrated PBL was applied, in comparison to TDL. They further state the students showed a higher preference for the former.

2.5.3 PBL as independent yet integrated with PBL

Rudiger *et al.* (2003:339) presents another different PBL/TDL integration mini-model. In their views, students can be taught using both a PBL and a TDL approach with the need to develop both a detailed understanding of theoretical concepts and solution-development abilities. Assessing paramedic university students, from a Berlin university, they concluded that this approach appealed very well to students (who rated it positively) and also enabled the development of the targeted competences. This study summarises their findings into the second mini-model shown below:

Figure 9: PBL and TDL – Independent yet integrated



Source: Developed by researcher applying views by Johnson *et al.* (2006:121-2)

In the mini-model above, the two are independent yet integrated in delivering particular skills and knowledge to students. For instance, a PBL approach can be used in delivering some lectures, while some are delivered using TDL. The intersection represents lectures conducted using both approaches, as necessitated by the content that need to be learnt. Johnson *et al.* (2006:121-2) assert that the integration of PBL and TDL, as above, is firstly necessitated by the fact that both methodologies have got certain advantages for students and that students exhibit varying preferences for both. From PBL, students can benefit from the flexibility of the learning process that enables them to develop autonomy and problem solving abilities, and also the ability to remember concepts with greater ease.

TDL, on the other hand, enables students to clearly understand what the academic process requires from them, through the guidance of lecturers.

2.5.4 Stand-alone PBL and Stand-alone TDL

PBL and TDL can, and often do, exist as completely independent and unrelated parts of a curriculum. This means that institutions or courses would apply either a PBL approach or a TDL approach and not any combination of the two. This scenario is represented by independent circles representing the independence of each approach from the other.

Figure 10: Stand-alone PBL and Stand-alone TDL



Source: Developed by researcher, applying views by McCarthy (2010:228).

Under TDL, as previously discussed, lecturers take charge of the teaching and learning process, while students take the role of knowledge recipients. The lecturer is the centre of the learning process, which is highly structured and designed to ensure that students understand and memorise content for examination purposes (McCarthy, 2010:224). Under TDL, assessment is strictly conducted by the lecturer, and individualistic learning, rather than group learning, is encouraged. PBL focuses on problem-resolution, using learnt academic content and broad knowledge from the wider social environment. It encourages students to take charge of the learning activities, while the lecturer takes

responsibility of directing the process, rather than the content. Group learning is also encouraged, as students work in groups to seek solutions to problems.

In some educational settings, the two approaches are used independently of one other, with some institutions choosing to rely on TDL in teaching (McCarthy 2010:228). The scholars who wish to completely separate the two, rely on the following differences between the two models, with a bias towards supporting PBL:

Table 2: PBL and TDL differences

Traditional Didactic Learning	PBL
Lessons are highly structured and are delivered rigidly, as planned.	Lessons can be flexible to accommodate students' group and individualistic situations.
Strong use of academic language and technical terms.	Language used is in response to a particular need-it is mostly technical and general.
Lecturers lead and direct the learning process.	Lecturers facilitate the learning process, while students lead on learning content.
Students encouraged to memorise and remember learning content.	Students encouraged to know how to apply learning content to situations.
Rewards are based on precise and accurate technical answers.	Rewards are based on solutions to problems and approaches taken.
Individualistic learning focus.	Group learning focus.
Lecturers are expected to know everything relating to the learning content.	Lecturers may not understand some scenarios that students may present.

Source: various

In conclusion, from the above discussions, it can be noted that the integration of PBL and TDL is sometimes viewed as a feasible solution to enable students to benefit from the advantages of both methods, while limiting the disadvantages of each. It can also be observed that scholars believe that this integration can take various, angles, determined

by the situation, students' situations and objectives of the implementing institutions playing a major role in determining the integration model.

2.6 Problem-Based Learning as a strategy

Lowenstein (2003:103) mentions that PBL is a learning/teaching strategy that is executed within a little group setting with a faculty facilitator. This strategy is based around a realistic scenario of a clinical case, and students are active respondents in the process of learning. Their learning is motivated and self-directed by the requirement to perceive and solve the scenario case (Barret, 2004:56). PBL is a useful process in a profession where problem-solving, lifelong learning and critical thinking are important to the practice (Savin-Baden, 2000:10). PBL has been approved in the field of medicine, and has developed to become a leading system of learning for several law, business and medical schools. It is being adopted for use in secondary and elementary schools and environments of corporate training (Barell, 2006:192). It reflects the view that knowledge is built, rather than acquired, and is based on the consideration that knowledge emerges from practical experience. In certain extensive models, problems are classified as ill-structured, as they are drawn on real-life scenarios (Kolmas *et al.*, 2009). Boud and Feletti (1997:16) discuss the point that PBL is a student-focused and instructional process, that requires learners to organise, research, and combine practice and theory to create solutions.

Management execution is often criticised for being disconnected from practice. In traditional lecture-based learning, students often learn concepts and theories that do not pertain to practice. They are trained in techniques that can rarely be used. As a result, they do not develop “soft skills”, such as the ability to communicate in situations of teamwork and leadership, nor are they sensitised to the political realities of organisational life through this technique and method of instruction, that delivers information as quickly as possible (Smith, 2001:357). This mode of teaching has resulted in passive students, who cannot readily apply what they would have learnt (Major & Palmer, 2001:6). A rapidly changing labour market demands a more flexible labour force that is directed towards a growing proportion of knowledge-intensive work in teams and lifelong learning, and that

is also able to apply this knowledge to solve complex problems in an efficient way (Engel, 1997: Poikela & Poikela, 1997:11) (Dochy *et al*, 2003:534). The need to help students develop into autonomous and self-directed learners is a further challenge to overcome. They have difficulty in becoming active learners. The approach of learning is characterised by rote learning and memorisation (Jikmsek, 2004, 75 Kaya, 2009:32).

In the context of the requirements and the dire need of the industry, it can be hypothesised that their demands cannot be met through traditional pedagogy. A mixed approach, as successfully adopted at several of the other institutions, is more of a requirement than an add-on, in the educational system. It, therefore, seems that PBL is likely to be more readily adopted and adapted by TUT because it is expected to get the support from educators, students and industry (Slott *et al*, 2003:13). This is further supported by Steinemann (2003:216), who believes that, as faculties introduce PBL as a strategy, it will eventually address and create a conducive environment to deal with these issues and allow competencies to grow, and address the supply and demand of the industry and labour.

Bakar and Hanafi, (2007:203) believe that dealing with capacity and challenges on the hands-on skills alone would not be sufficient in dealing with the complexity of problems in an actual workplace environment. The success of the implementation of PBL in Makerere University was attributed to several factors, including:

- (a) recognition of the need for change in the curriculum,
- (b) realisation that academic staff could not do it all on their own and thus sought the involvement of stakeholders in the planning,
- (c) utilising collaborators from other universities,
- (d) planning in line with government education policies and
- (e) the training of teachers in participatory approach, which provides ownership student sensitisation (Kiguli-Malwadde *et al.*, 2006:129).

2.6.1 PBL strategy in learning

Barrows (2000:vii) states that numerous features are essential in accomplishing the targets of PBL. These involve the overall PBL facilitation, tutorial process, collaboration, post-problem reflection, problems themselves and personally-driven learning. A tutorial session of PBL starts by providing a set of students with reduced data about a study issue. Hmelo and Lin (2000:227) opine that students must employ querying processes to acquire extra problem data from the outset, and they may also collect facts by performing research or experiments. At the several phases of the problem of interest, students conduct brief evaluations to appreciate their own understandings of the information they have gathered, produce queries about the information and hypothesise about underlying causal processes, that might support or describe it. They also figure out concepts they require to study about to solve the issues.

In a similar way, Greeno, Collins & Resnick (1996:37) mention that Problem-Based Learning assists construction of knowledge as students are able to reflect on their own personal experiences, before formal discussions start. It also supports the development of social skills within students through regular interaction with other students in group learning. Consequentially, students with both problem-solving and intellectual and academic capacities are churned out as graduates.

It also assists social building of knowledge as learners perform in small groups, using skills of inquiry to solve real-world issues. For instance, medical students study by solving real patient issues, using skills of inquiry for the medical practice. Lampert (2001:190) states that PBL empowers students' understanding of concepts through problem-solving activities, as well as through social and communicative interactions. Hmelo-Silver (2006:147) asserts that, in PBL, students may also use whiteboards as part of the learning process. While in traditional pedagogy, whiteboards are a tool for the teacher or lecturer only, under PBL models, students can plan their work using the same tool. They further advise that students can create columns or other guiding graphics that identify the problem, how to solve it, challenges associated with solving it, amongst others. The same whiteboard strategies are also recommended by Dillenbourg (2002:63), who states that

access of boards by students facilitates focusing on the problem and progress tracking, while also helping students to externalise the problem they are dealing with.

2.7 PBL AND THE STUDENT

In PBL, the student is responsible for his/her individual learning, and lecturers/teachers only act as facilitators (Barcons, 1997). Gwee (2008:16) also maintains that the process challenges committed involvement in the students respective small groups, in order to construct their own respective meanings and understandings of materials or the subject matter to be learnt. In response to this challenge, faculties were encouraged to update and improve their courses to accommodate the student-headed, group-focused learning that came with PBL (Smith, 2005:375). As a new approach in reaction to challenges faced by traditional education, PBL was encouraged as a strategy to stimulate intellectual thinking and lead to reconstructions of knowledge in each student, as well as to enhance his/her intrinsic curiosity in the study area (Dolmans *et al.*, 2005:884; Major & Palmer, 2001:4).

Under a PBL mode of teaching and learning, students can effectively collaborate in the knowledge development in their classmates (Alajmi, 2014:43). As argued by Salomon (1993), collaborative learning in groups can help in the distribution of the learning burden per student.

In an empirical PBL effects study on a US middle school learner, Belland, French & Ertner (2009:2) found that students indeed benefited through the distribution of the cognitive load across a mixed group. In the study, students, including those with learning challenges, were able to participate in at least some sections of the study problems, despite their perceived cognitive challenges.

Students in a PBL environment are also operationally involved in the teaching and learning processes. In group learning, students take various roles (Belland, French & Ertner, 2009:2; Barrett, 2004:56) that include:

- Group leader

- Time-manager
- Presenter
- Secretary/scribe
- Ordinary member
- Editor

In playing these roles, students work across problems that would have been advanced to them by an instructor, and come up with group solutions. Group roles can be distributed through nomination or volunteering and are generally rotational. Groups keep record of their performances and all important matters that need to be recorded (Dolmans *et al.*, 2005:735; Barrows, 2002:60; Belland, French & Ertner, 2009:2). In addition, Belland, French and Ertner (2009:2) observed that learners divided roles they played in PBL exercises into three levels: macro-strategy, micro-strategy and task roles, and these roles were defined by a learner's cognitive capacities. Macro-strategic roles identified the overall solution or outcome that was needed, while micro strategies identified the necessary steps to attain these solutions. Tasks referred to the actual activities that learners undertook, to solve the problem. This division of roles generally ensured greater learner-inclusivity and participation than under traditional learning and teaching, where learners could feel completely left out.

In taking the above responsibilities, students directly regulate their own learning and oversee what and how they learn. They assume greater responsibility than under a conventional pedagogy environment, where the teacher or lecturer assumes a leading role in giving students theoretical knowledge, while students play a receptive role. In their PBL experiment on the facets of PBL on adult learners, Malan, Ndlovu & Engelbrecht, (2014:12) concluded that PBL motivated students to plan, co-ordinate, assess and distribute their work, skills that they would normally not develop under a conventional learning process.

2.7.1 Student factors affecting implementation of PBL

PBL, as a strategy, affects persons from different backgrounds and demographic settings differently. PBL implementation must, therefore, not imply homogeneity on the students, and must recognise the important differences that may, in some instances, negatively affect the effectiveness of PBL (Walker *et al.*, 1996; Dyke, Jamrozik & Plant, 2001:374; McLean, Van Wyk, Peters-Futre & Higgins-Opitz, 2006:96; Singaram, Dolmans, Lachman & van der Vleuten, 2008:116). Additionally, Omeri (2003:15) and Rienties & Tempelaar (2013:188), also believe that diversity effects may also be seen on the facilitators of PBL. This section, however, focuses on student-related factors. Age, gender, educational background and linguistic issues have been identified, from the literature, as major variables that affect student's perception and reception of PBL.

2.7.1.1 Gender

The effects of gender on PBL learning effectiveness are widely discussed in PBL literature, and education literature in general. There are popular views that male and female students received and appreciated PBL differently, and these differences were further compounded on the gender of the facilitator and the composition or mix of the genders, i.e. the dominant gender in terms of class or group numbers (Kaplowitz & Block, 1999; Reynolds, 2003:35).

There were differences in how male students and female students assimilated into PBL groups. Female students were more inclined towards working in small groups that formed part of the PBL processes, than males were (Fletcher, Jordan & Miller, 2000:245). In addition, interpersonal relationships with other group members affected their degree of group engagement and sense of belonging – both factors being associated with how effective PBL sessions turned out to be. Male students, as argued by Belenky, Clinchy, Goldberger and Tarule (1986:11), exhibited low group-work preferences and preferred independent learning. Going by this view, PBL implementation would be much of a challenge in male-dominated classes, in comparison with female-dominated ones. Reynolds (2003:35), however, refutes the above view, arguing instead that there is hard

evidence that shows that both genders fit in well in PBL processes, and can benefit immensely from PBL.

2.7.1.2 Age

In diverse academic institutions like TUT, age differences can be expected within the learning environment. Different scholars have sought to explain how age differences affected the effectiveness of PBL processes. A study by Aldred, Aldred, Walsh and Dick (1997) asserts that maturity is an important determinant of the degree to which students will benefit fully from PBL. They argue that, because PBL cases required the application of real-life experiences, persons with wider experiences due to their age, performed better and more comfortably under PBL than those who were younger. In Alajmi's (2014:44) view, younger students also felt that more mature students dominated group work activities, using age as a justification for such dominance. In contrast, Joseph *et al* (2011:4) found no significant relationship between age and the performance of candidates in PBL exercises. They also conclude that the perceptions of students on the effectiveness or appropriateness of PBL, did not vary by one's age.

2.7.1.3 Educational level

One's educational level can influence how they perceive, react to and perform within a PBL set-up (Alajmi, 2014:44). Students at first-stage levels of academic studies in tertiary institutions, because of orientation problems, seemed to struggle with coping with PBL (van der Hurk *et al.*, 1999). Alajmi (2014:44) agrees that orientation issues played a part in PBL acceptancy and adaptability amongst students. Alajmi further states that a student's previous exposure to PBL, at former schools, affected adaptability to PBL at university, while students coming from institutions that offered PBL modes of teaching and learning, adapting well. In agreement, Yam and Rossini (2015:294-296) state that a certain level of experience was required for students to fully appreciate PBL as a T&L medium. For students, exposure to PBL in earlier academic levels helped to create the experience in the medium. Yam and Rossini (2015:294-296) further state that the problem of experience also existed among teachers and facilitators.

2.7.1.4 Linguistic factors

Some scholars acknowledge the effect of linguistic barriers among students as factors that may adversely affect PBL effectiveness. One such scholar (Alajmi (2014:44) states that, because PBL was designed in English and is indeed delivered using English, non-native English speakers may face communication challenges when relating to other students in groups. Eng-Gwee (2015:15) associates language with socio-cultural issues, and states that students who have been taught and raised in a particular language, inherited cultural traits associated with that language, and such traits may or may not be supportive of student autonomy. Eng-Gwee (2015:15-16) suggests that to overcome PBL barriers imposed by language, students can be taught in both native languages and English, albeit within a PBL context. In contrast, Larsson (2001:3-4) sees no challenge when it comes to the relationship of PBL and language. The writer argues that PBL processes can be used to develop linguistic skills across students of different primary languages and ages. Going by Larsson's views, the language problems that students may face on the onset of PBL can be solved through regular interaction and communication with other students, within the PBL contexts.

2.7.1.5 Personality factors

A student's socio-cultural beliefs and accumulated experiences and values systems may define the types of educational system they are comfortable with (Azer, 2001:391). Azer (2001:391) concludes that students who struggle to cope with change, and who are too comfortable with lecture-based educational systems, will have challenges in adopting to PBL. PBL, with its emphasis on the student rather than the lecturer, may appear to be too much of a shift from the norm. Eng-Gwee (2015:15-16) states that cultural forces can have a strong effect on personal choices and preferences when it comes to learning styles. Students who come from cultures that value authority figures may strongly believe in the need to be led and guided by a teacher as an authority figure, in every aspect. In addition, some cultures, particularly eastern Asian ones, valued reticence and silent

contemplation as aspects of learning, and these values may make it a challenge for students shaped by these cultures to be fully expressive under PBL.

On personal factors, psychological and personality issues can also affect a student's comfort with PBL (Wijayanti, Irawanto & Murti, 2010:194). Wijayanti, Irawanto and Murti, (2010:194), using definitions and classifications by Suryabrata (2007), divide personalities into two types – introverts and extroverts. Introverts are generally challenged by the openness and interaction that comes with PBL exercises, including group presentations, open discussions and debates, and are more likely to feel uncomfortable and unappreciative of PBL. Extroverts, on the other hand, with their openness, verbal agility and high degree of interaction and communicativeness, are more likely to adapt well to a PBL setup. Other scholars, like Alajmi (2014:44), however place very little emphasis on personality differences in understanding PBL implementation.

2.7.2 General student challenges

Many institutions have conducted surveys to determine challenges that are encountered by students during implementation of PBL strategy. Some of these threats were mostly evident in the Temasek Polytechnic School of Engineering in Singapore, and included interpretation, empowerment and motivation (Yeo, 2005:510).

2.7.2.1 Interpretation

In some PBL processes, students often complain that lecturers refuse to give them the hints regarding where to go, in order to find solutions for tasks they are required to do. The students misinterpret this behaviour as being the lecturers' unwillingness to help them. Unfortunately, in this instance, students forget that in the PBL process, lecturers are facilitators and they just guide and trigger the curiosity of the students to explore an issue or a set of issues (Dixon, 2000:4).

2.7.2.2 Empowerment

Due to long exposure to traditional methods of teaching and learning, students often find themselves unprepared for the autonomy afforded to them during PBL, by means of group-focused and independent learning. Such responsibility involves work groups that are independent from the lecturer, and need to work cohesively to find solutions to presented cases. Therefore, students view this empowerment negatively, since the trust between the group members is usually not yet enshrined at these early stages. This is also why some members of the group end up doing a lot of the work because they do not trust that other members of the group can do the task. This negativity towards empowerment presents risks to the PBL process, because the success of PBL strategy lies in the collective learning, supported by collaborative trust (Walker, Bridges & Chan, 1996:14).

2.7.2.3 Motivation

Evidence suggests that, in many institutions where conventional teaching approaches are still predominantly being used, students are likely to experience PBL process negatively because their mindsets are entrenched in the traditional manner of knowledge acquisition. This lack of motivation results in lecturers finding it more challenging to impress students on the positives of PBL, such that they end up putting up with negative attitudes of students, which has an effect on the psychological and behavioural process of the students within the PBL environment (Polano *et al*, 2001).

2.8 PBL AND THE LECTURER/FACILITATOR

The literature discusses and explains the various roles that lecturers play in the successful implementation of PBL, in tertiary education institutions. This section discusses these roles and the challenges lectures face during PBL transition periods.

2.8.1 Facilitator's roles and responsibilities in Problem-Based Learning

PBL proponents generally refer to lecturers, tutors, teachers and other academic and technical instructors as facilitators. Neville (1999:393) states that PBL, as a growing academic dispensation, challenged educators to reskill and psychologically orient themselves towards a world where teaching and learning were driven by the student. Neville holds the view that, the traditional teacher skills, values and beliefs that put the educator at the forefront of learning, were not in full alignment with PBL expectations, hence the suggestion. Under PBL, the lecturer is transformed into a facilitator, who facilitates the learning processes and who stimulates and inspires students to embrace the learning process (Hasan and Stewart, 2002; Maudsley, 2009). Overall, as this process is both student- and problem-centred (Little, Ostwald & Ryan, 1995), the facilitator/tutor, as procedural resource person and learner in the making (De Graaf & Kolmos, 2007:6), is responsible for monitoring the group progress and providing feedback during formative assessment (O' Grady & Alwis, 2002; Woods, 2006). Agarwal (2004) emphasises that, in general, the educator is less an instructor or a director, but more a "facilitator" of learning. His/her task is to design and structure an interaction process, so that learners can first identify and then fulfil their educational objectives. The learners are able to participate in the diagnosis of needs, and then reach a conclusion through discussion and exploration.

2.8.1.1 Facilitation rather than lecturing

Barrows and Tamblyn (1980:107-109) redefine the main roles of an educator within a PBL set up. The educator is responsible for facilitating, rather than leading, the learning process. This means the educator helps the student to teach himself or herself, rather than doing the actual teaching. The views of Barrows & Tamblyn (1980:107-109) prescribe to the constructivist philosophy of learning by suggesting that the educator should not determine the exact knowledge the student must develop, but must simply support the knowledge creation process by setting up procedures that enable the former to create their own knowledge.

Goh (2014:162) came up with a more comprehensive yet summarised list of the roles of educators in PBL environments, from a study conducted in Singapore polytechnic colleges. These roles are:

- Directing students to understand learning objectives within a given course, subject, topic, and so on,
- Assisting students to create reasoning capacities and inquiry and argumentation levels that support problem solving,
- Assisting students to work together in groups, and to fully integrate their learning with group structures,
- Assisting students in understanding the PBL learning process so that they can take control of it,
- Assisting students to develop self and group evaluation capabilities,

The above-mentioned roles appear to be process-oriented, rather than content-oriented, and the facilitator's concern is to ensure that students understand the PBL process so that they can fully apply it in their own learning. This agrees with the views expressed by Barrows and Tamblyn (1980:107-109), that educators are process drivers, while students drive the content.

Morrison adds that lecturers, in their capacity as professional knowledge deliverers should, create an interactive and safe learning environment, effectively communicating with learners, curriculum team members and external agents to create mutual respect and positive behaviour. Lecturers, as Morrison (2012:11) adds, should also use various strategies to instil independent learning at all levels, and address individual and group needs of learners. The author further notes that lecturers are uniquely positioned to foster positive attitudes to human diversity and globalisation, through the use of effective teaching and assessment strategies, to meet the diverse learning needs. Morrison (2012:11) further highlights that lecturers, through use of various evaluation strategies, can predict future implications of teaching practice.

Facilitators' roles were also limited by the nature of PBL as self-led learning. Due to the fact that PBL was directed by and centred on the student, it was possible for PBL to flourish, even under conditions where students did not have a facilitator (Chuan *et al.*, 2011:394). Chuan and team confirm that experiments conducted at a Malayan university confirmed these findings, but were quick in stating that, at the early stages of academic orientation with tertiary education, students needed facilitators to guide them through the PBL processes and the covered curriculum.

2.8.1.2 Group facilitation

The facilitator has an important task of developing procedural guidelines, rules and processes that guides group interactions within PBL sessions (Azer, 2005:676-679; Barrows & Tamblyn, 1980:107-109 & Chuan *et al.*, 2011:394). This is because group learning, rather than individualised learning, is strongly reflected in PBL processes. Constantino (2002) and Hitchcock *et al.* (2000) opine that facilitators should be more experienced, so as to assist effectively in group/team discourse, without taking over the knowledge development process. Savin-Baden and Major (2004) also agree that facilitators should develop learning independence expectations in their students. They have a role to ensure that students appreciate this new independence, and are able to apply it is the development of solutions from problems at hand. Azer (2005:676-679) defines the various group management roles of a PBL facilitator, and goes further to provide tips on how best these roles can be played. These tips are as follows:

1. Helping the students establish rules on how to interact in groups;
2. Assisting students to understand and appreciate their own roles within the PBL process;
3. Helping students to appreciate and develop trust and mutual respect of each other;
4. Being a role model of knowledge development;
5. Supporting students with meaningful feedback on how they are performing.

Facilitators, however, do not always competently play the above-listed roles. The next section discusses problems they may face in their PBL execution.

2.8.2 Facilitator-related challenges in PBL implementation

Educators, commonly referred to as facilitators in PBL, faced a myriad of challenges in implementing PBL as a teaching methodology. PBL challenges for educator upskilling to meet the changes associated with the new roles that come with PBL changes (Berg *et al.*, 2000:351-372). Additionally, changes in attitudes and philosophies are also required. Since the implementation of PBL will provide opportunities for highly charged interactions to take place between teacher and students, faculty members would need to keep an open door policy and continue to act as resources for specialised information when students seek better understanding on what seems to be complex to them (Steel, 2001:34). The problems hinted at, above, are further broken down and expanded on, below:

2.8.2.1 PBL knowledge related problems

One common type of problem was the lack of adequate understanding of PBL processes amongst facilitators, especially during the early phases of implementation. Facilitators lacked the knowledge on three key issues, i.e. how to facilitate the PBL processes without dominating the students (Maudsley, 1999:659); how to instil a sense of direction in the students' quest for solutions and how to develop the critical analysis skills necessary in problem-solving (Azer, 2005:676).

The problems that facilitators face when attempting to teach using PBL methods, can result in the failure of PBL (Maudsley, 1999:659). If facilitators cannot understand the processes of PBL, it will be impossible for them to impart PBL-process knowledge as expected (Maudsley, 1999:659). Furthermore, students are less likely to respond positively to methods and processes that their teachers seem unsure of (Azer, 2005:676). This requires implementing authorities to consider investing in facilitator education and orientation, as part of PBL implementation processes.

El Naggar *et al.* (2013) propose a 10-point training regime they believe will improve PBL acceptance to facilitators. The steps are geared towards improving facilitator awareness

and expectations, but may, however, fail to address extrinsic motivational issues. These steps are as follows:

1. Develop an understanding in PBL steps amongst facilitators;
2. Identify and discuss the roles of the PBL awareness development facilitation team;
3. Outline and discuss the responsibilities of a facilitator under PBL;
4. Teach facilitators on how to question students during PBL sessions;
5. Educate facilitators about group issues including group complexities, dynamics etc;
6. Educate facilitators to teach students how to understand and critique problems;
7. Provide time management lessons;
8. Equip facilitators with skills to deal with problematic cases and sessions;
9. Assist facilitators to develop student assessment skills under PBL;
10. Evaluate the facilitator skills development process.

The 10 steps, mentioned above, generally cover the major areas of PBL as discussed in the literature from problem identification, group management to student assessment. Their writers make the claim that they have been successful among medical tutors in the Middle-East.

2.8.2.2 Facilitator motivation -general

PBL will progress more productively if facilitators are motivated to drive the process. Facilitators must inspire to be part of the PBL process and must see its benefits to the academic and professional environments (Aram & Farid, 2011:298). Many factors affect the motivation of facilitators to be part of PBL efforts. These factors stem both from the academic or teaching environment and the personal environment, which renders motivating facilitators a daunting task (Lan *et al.*, 2009:565-6). External motivational issues may include the following (Aram & Farid, 2011:298):

- Low remunerations and benefits perceptions
- Poor working conditions (time, resources, rules and regulations)
- Poor working physical environments
- Low appreciation by students

- Perceptions of low recognition
- Poor leadership

The above motivational factors will affect how PBL facilitators will apply teaching and learning processes with low motivation result in a poor personal application of teaching processes. Low motivation issues can cause a failure of PBL and other teaching processes (Aram & Farid, 2011:298-90) and without proper monitoring systems, such failures may be blamed on the weaknesses of PBL processes.

2.8.2.3 PBL-led motivation

Facilitators may also lack motivation in relation to the PBL process itself. Despite being well-remunerated, resistance to PBL processes may cause motivation to lower, resulting in facilitators intentionally withdrawing their energies from PBL. Low motivation, in this regard, may be caused by various factors (Lan *et al.*, 2009:565-6). Low motivation and, therefore, lack of interest in the implementation of PBL, may be a result of personal fears that facilitators may hold (Lan *et al.*, 2009:565).

Facilitators may fear that, under a PBL regime, they will end up doing much more work than they were doing under traditional teaching modes. The preparation of detailed case studies in PBL can result in a lot of additional work for facilitators. However, some scholars argue that, under PBL, facilitators actually do less work because students take charge of the learning processes and, in many cases, the assessment processes. For the sake of balance, it must be noted that case preparation complexity-levels differ according to discipline and educational level of students. In some disciplines and levels, case preparation might represent a proportional increase of work time for facilitators, while in others, it may not (McCaughan, 1986:101-107).

Another factor that may negatively affect facilitators support for PBL, is the fear of losing power and control over students (McCaughan, 1986:101-107). Most facilitators were trained in environments where the lecturer was considered the centre of learning (Fong *et al.*, 2007:607). The lecturer directed the curriculum related activities, content to be learnt and the context within which it was to be learnt, as well as student assessment. Under

PBL, the transformation of roles between the educator and the student can be quite threatening and indeed frustrating for some educators (McCaughan, 1986:101-107).

2.8.2.4 Facilitator's background

An educators' own personal and academic background can also affect their perception on PBL. Educators who have spent all their teaching lives within a traditional pedagogy context and who, in turn, were trained under institutions that strongly believed in this mode of teaching, may experience transformation problems with PBL (Fong *et al* 2007:607). Most lecturers from non-scientific fields were generally trained to apply lecturer-centred methods of teaching, where teaching and learning are centred on one individual. Asking such lecturers to immediately change to PBL without prolonged training and orientation to it, can result in resistance or withdrawal (Fong *et al* 2007:610). Another background issue also relates to the kind of earlier educational exposure that lecturers had when they were growing up. Lecturers who went to well-resourced schools that had an element of autonomous research and learning, will adapt to PBL more readily than those who went to poorly-resourced schools where students were forced to rely on the teacher as the central source of information.

2.9 Leadership and Faculty staff roles under PBL

According to Huichun & Henriksen (2010:4), factors that facilitate the success and applicability of PBL implementation include, among other things, enthusiastic involvement of top managerial staff, vice chancellor, deans of faculties and heads of departments. The role of these members should be able to motivate and mobilise the rest of the staff during the PBL strategy implementation process.

On-going workshops, seminars and staff training keep staff updated and motivated. The benefit of training, workshops and seminars, as observed in some institutions, was very significant to the success of the PBL implementation process, since staff were able to observe the facilitation and problem formulation from their colleagues who had experience in PBL. This also motivated staff to be part of the implementation process, and the derived motivation positively influenced the implementation process itself

(Huichun and Henriksen 2010:4; Barrows, 2000:117). Apart from an enthusiastic team of teachers, a determined leadership was important in the initiation and propulsion of successful PBL programmes (Barrows 2000:117). The deans of the medical schools that succeeded in PBL implementation were very much in the leading role – right from piloting, up to the actual implementation of PBL (Barrows, 2000:117).

In his report, Barrows (2000:117) summarised the factors that promote the success of PBL implementation in many places. He suggested that the leadership of the college, the dean of faculty that provides support to staff members or persuades them, is a tool for the aforementioned success. The availability of staff that is willing to go through with PBL implementation also goes a long way in the success of the programme. When the academic support staff are involved with PBL and are willing, students receive adequate support, and the programme is promoted.

Mpofu *et al.* (1998:421) caution that PBL implementation may negatively affect the student body if the interests and expectations of students are not harmonised with those of facilitators. In their study on university students in the United Arab Emirates, they found that students often lacked an understanding of what facilitators expected of them, and what facilitators perceived as important academic factors. This lack of knowledge challenges the effectiveness of PBL, as well as the degree to which both the students and the facilitators appreciated it.

2.10 Curriculum design factors

To effectively implement a PBL strategy, there is a need to review the curriculum that is in use and to identify one that supports PBL (Barret, 2005). Furthermore, there are important decisions that need to be made by an institution, i.e. where PBL is fully or partially introduced to a whole study programme (Barret, 2005). Barret further lists crucial questions and issues that need to be addressed, prior to or in the process of introducing PBL. These are:

- Identification of inside and outside stakeholders in curriculum building at the institution;
- Identification of team expertise in building curriculum;
- Identification of goals, objectives, visions, values and beliefs of the programme in which PBL is to be introduced;
- Reconciling how PBL processes will aid the attainment of the programme's objectives;
- Determining how the PBL-empowered programme will be marketed to stakeholders.

The curriculum upon which PBL sessions will be based, and upon which students will be assessed and evaluated, must motivate students to want to participate in learning (Dolmans *et al*, 2001:388). The interpretation of official curriculum policy text must create a conducive learning environment, within which PBL may flourish (Bernstein, 2000). Taylor and Mulhall (2001) believe that a problem-based approach requires flexibility of teaching instruction and curriculum frameworks.

The Problem-Based Learning approach shapes the institutions' program curriculum, which provides student orientation to the pedagogical method, explicit links to theory and practice, adapting appropriately to paradigms to support clearly articulated educational objectives of the programme (Maurer & Neuhold, 2012). Curricular adjustment raises further challenges for other disciplinary areas because teachers may perceive this as a loss of control over content. All the above might later lead to a poor implementation of PBL affecting the quality of education that students would receive (McLoughlin, 2005:190).

2.10.1 Case-based curriculum

A PBL curriculum is strongly dependent upon cases. Cases are the problems that students will deal with, within a given study time-frame, and are reflective of the topics of study which students would otherwise cover under a conventional teaching and learning scenario (Azer. *Et al*, 2014:807). Due to the importance of capturing real problems in

cases, careful planning and organisation is required in the development of cases (Dolmans *et al.*, 1993).

Azer *et al.* (2014:807) give twelve tips in designing cases that are part of a meaningful and responsive PBL curriculum for tertiary learning. These are the following:

1. Establish a team of expert educators to construct cases;
2. Establish the goals and outcomes of every case;
3. Design a case template;
4. Assess how the cases integrate with real-world issues;
5. Fine-tune cases to meet students' learning requirements;
6. Identify captivating starting points of a case (triggers);
7. Construct visual aids for cases;
8. Support deductive evaluation of cases;
9. Ensure cases will meet knowledge and practice goals;
10. Consider how students will interact with the cases;
11. Develop instructor's manuals for each case;
12. Develop feedback mechanisms.

These guidelines are not exhaustive but are important in forming the backbone of the case study approach, upon which PBL will be based (Azer *et al.*, 2014:807). The above views are congruent with those of Barret (2005), i.e. establishment of an expert team, goal-orientation, concern for student reaction and the development of feedback mechanisms. In addition, Smith (1999:424) researched on the qualities of a good case or problem for PBL contexts, and concluded the following:

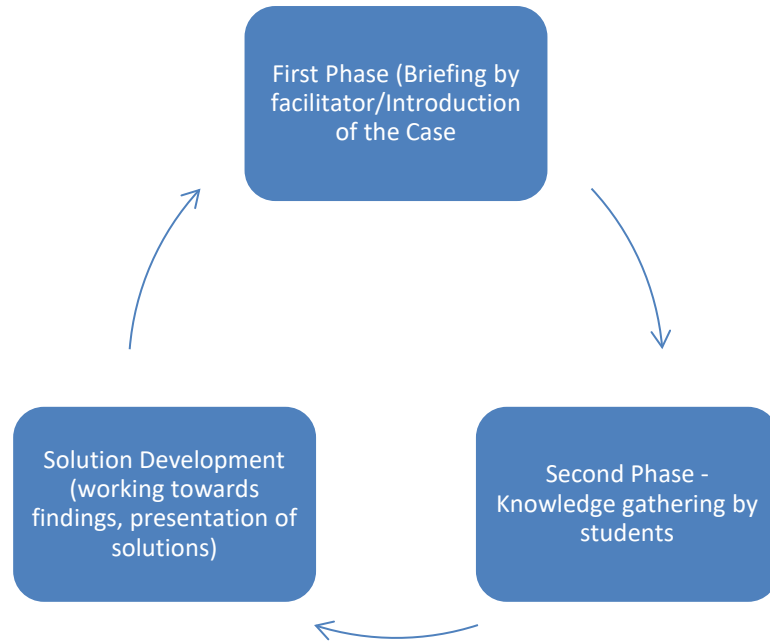
- It should be challenging yet solvable – there should be a solution to it and students must, eventually, be able to decipher this solution;
- It should be relevant to the current aspects of the curriculum – the case should be related to what students are currently in the process of learning;

- It should offer a degree of flexibility in terms of generating solutions – the problem or case presented could have various, albeit related, solutions that dependent on the diverse perceptions of the students;
- A case should be interesting enough to stimulate students to study towards finding a solution to it;
- The case or solution should encourage group co-operation by requiring interventions that depend on the contributions of various team members – it should not only be understandable to a small fraction of the group;
- The problem should be integrated enough to ensure that students, in their attempts to solve it, are able to explore various social, economic and political platforms – broadening their knowledge in the process.

The above suggestions, or at least part of them, have also been acknowledged as important by various scholars including Azer *et al.*, (2014:807) and Davis and Wilcock (2003:1-7). The latter provide further suggestions on improving cases or problems. They suggest that engaging students in the actual development of the cases could help stimulate an interest, and make cases more applicable to the students. They also suggest that engaging industry experts, expert lecturers and external examiners in the production of cases, could result in rich, relevant and highly educational cases.

Jones *et al.*, (2010) discuss the structure of case learning. They identify a case as having three distinct learning phases. The first phase is the problem briefing and identification stages, where the facilitator presents the case to the class. The second phase is the knowledge accumulation phase, where students, in groups or as individuals, gather information on the case context. In the final phase, students put the knowledge they would have gathered in the second phase into practice, by solving the case problem.

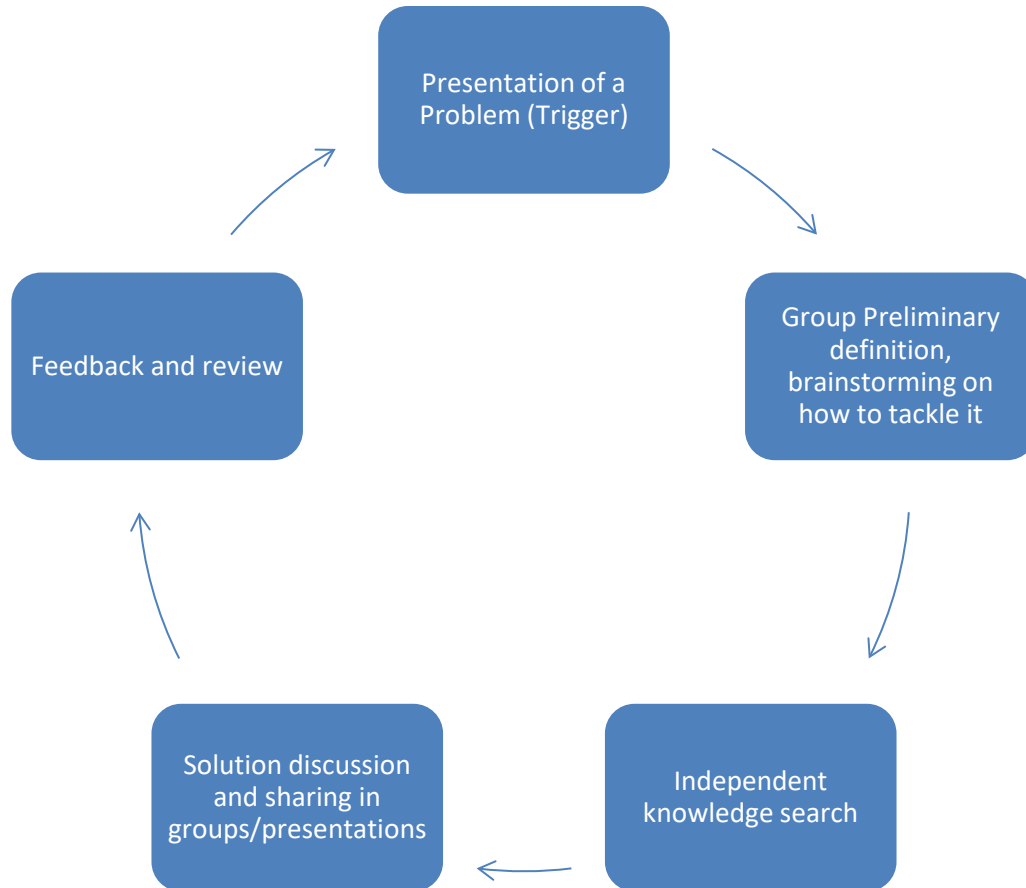
Figure 11: Jones et al.'s Phases in Case Study Learning



Source: Developed by researcher, using views by Jones *et al.* (2010).

In the views of Jones *et al* (2010) students need between four to seven days to deal with each case to enable the effective gathering of knowledge and collaboration. Barrett (2005), however, believes there are more than three core phases involved in each case in PBL. Below is their Case Learning model:

Figure 12: Barret's Phases in PBL Case Learning



Source: Developed by researcher, using views by Barret, 2005

The models or phases above share the similarities that students engage in both group and independent studies in search of solutions, and that a problem of study is introduced first before students are exposed to theoretical learning content. These similarities exist despite the fact that Jones *et al.*, (2010) were discussing PBL cases from a tertiary medical institution perspective, while Barret was discussing it from a junior school perspective.

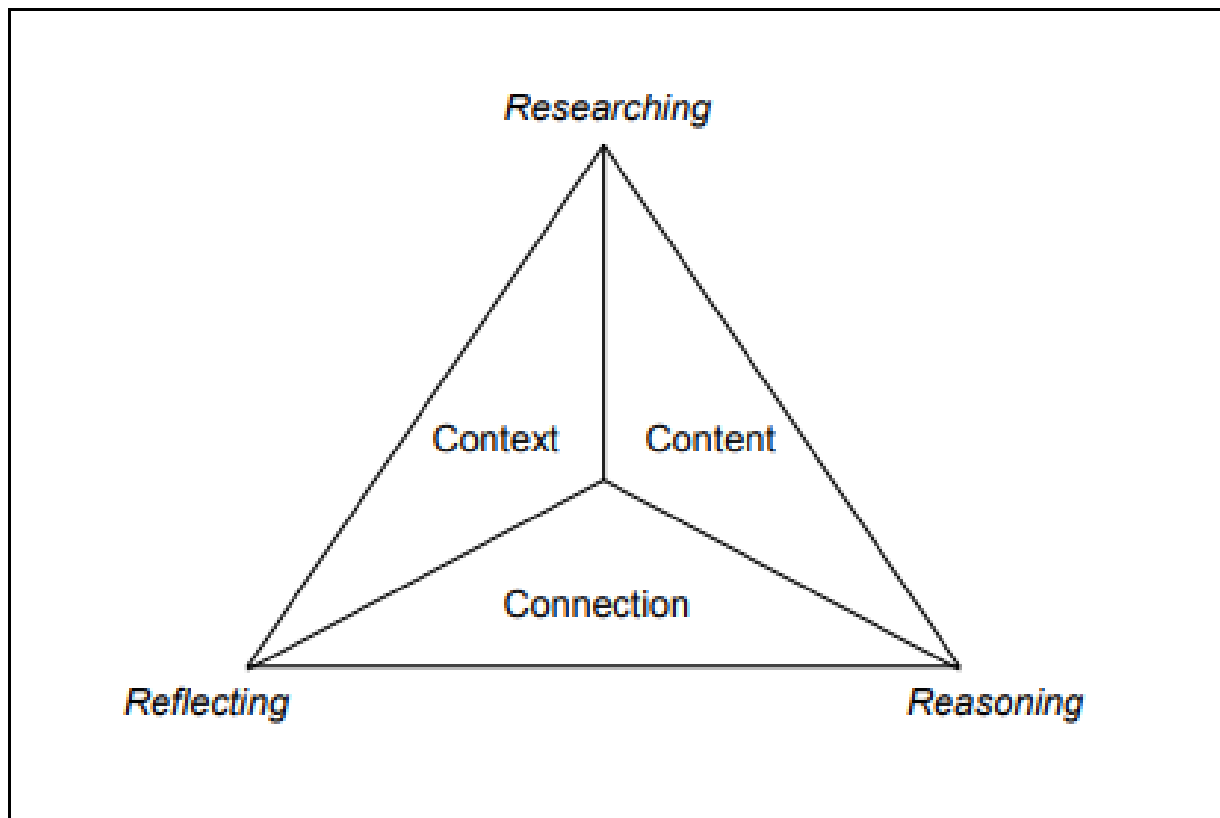
2.10.2 Problems as part of the curriculum

In Barret's viewpoint (2005), the term problem might be a bit misleading. Problems, in PBL cases, can be any real-life situation or scenario that students need to apprehend as

part of their learning. As such, problems could be concepts, theories, challenges, enigmas and dilemmas. De Graaf and Kolmos (2003) assert that problem-formulation should be able to address learning content, context and comprehension in relation to real-life scenarios. Furthermore, the problem should stimulate learning and be able to relevantly direct the learning process (De Graaf & Kolmos, 2007:6). Enermark (2004) found that, sometimes, problems in PBL are ill-structured to reflect real-world situations. In general, the many views above suggest that problem development, as part of PBL curricula, is not a matter where a consensus has not yet been built.

To assist the problem-formulation process, Hung (2006) developed the 3C3R PBL conceptual framework model, shown below:

Figure 13: 3C3R PBL Problem Design Model



Source: Hung 2006:57

In the above model, core-components of a problem are the three elements that are inside the pyramid. These relate to the nature of the problem, how its many parts are related, the environment in which it occurs, and what has been written about it. The three external elements (outside the pyramid) – reflecting, reasoning and researching – are verbs indicating what students should do in their attempts to solve the problem. Hung's model, therefore, relates the nature of the problem to the processes that students must follow in solving it. Problems in PBL should, therefore, be structured in a manner that ensures the following:

Students must be able to:

- Identify interdisciplinary and multidisciplinary connections in the problem;
- Identify the subject matter, concepts and theories relating to the problem;
- Appreciate the real-life context in which the problem occurs.

Upon achieving the above, students must then be able to apply their skills to:

- Research on the problem to get solutions;
- Reflect on their own experiences in resolving it;
- Think conceptually and logically to determine solutions.

Hung's (2006:54) model, in the views of the researcher, creates a positive starting point in the structuring of a suitable problem.

2.10.3 Student Assessments in PBL

Within the PBL environment, it should be effectively possible to assess the progress and challenges of students (Barett, 2005). Clark (2017) cites the availability of various approaches to tackling PBL cases as an area that poses grading and assessment challenges to educators. Clark focuses on the development of comprehensive rubrics, student-to-student assessment processes, and self-assessment as core areas that can improve PBL assessments. With rubric development, students should be advised of this before they embark on a case, and should also be taught to interpret the marking

requirements of each case. Like Clark (2007), Lambros (2004) also discusses self-assessment as an important aspect of PBL student evaluation, further adding that the ability to assess oneself will also be of significant value in later life.

2.10.3.1 Constructivist nature of PBL assessments

Savin-Baden and Major, 2004:118 contend that PBL student evaluations should accommodate the subjective or constructivist nature of knowledge. As knowledge is not universal, an approach that assesses the difference perception of what constitutes knowledge is critical in PBL (as PBL itself assumes that knowledge is constructivist). In agreement, Lambros (2004) states that the plasticity of PBL knowledge construction processes should be reflected in the student evaluations.

Lambros (2004) asserts that, because PBL involves flexibility and creativity, assessment measures should possess similar qualities. The use of real-life problems in training programmes should be in line with the goal of allowing students to demonstrate their understanding of the topic taught using the PBL approach. Additionally, unlike in conventional teaching and learning, where assessment is done on the knowledge assumed to be acquired, in PBL, the whole process of learning has meaning in the life of a student and, therefore, should be assessed and marked, as well. The above-mentioned scholars, therefore, share a common view that current evaluation methods such as written examinations and tests are not truly reflective of PBL achievements of students.

2.10.3.2 Assessment challenges

The above-proposed assessment of PBL projects presents other challenges to assessors. While the subjective and constructivist element of knowledge, discussed above, enabled students to fully connect the learning process with reality, the development of a consistent rubric, as a result of this constructivist aspects can be a challenge (Brodie & Gibbings, 2014:1). This challenge reflects itself through the failure of different assessors to come up with a consistent mark or grade for the same piece of work. Additionally, the marking and assessment processes can create feedback

challenges, especially when it is assumed that the students' reality is reflected in their work (Brodie & Gibbings, 2014:1). The aforementioned problems and challenges call for the development of marking rubrics and assessment models that are flexible enough to meet the various views on knowledge construction, yet consistent enough to enable assessors to effectively evaluate students and offer valuable feedback (Brodie & Gibbings, 2014:1).

2.10.3.3 Students as assessors

While in traditional classroom setups, the teacher or lecturer is the sole student assessor, PBL proponents, such as Lambros (2004), Barret (2005) and Pawson (2006), on the contrary, render the student to be the main assessor. They identify two types of student-driven assessments, i.e. student-to-student evaluations and self-evaluation. In the former, students, after the end of a problem or case, rate how each group has performed and, in self-evaluation, the students themselves will pinpoint the strengths, weakness, points of improvement of their output (Lambros, 2004). Blumberg (2004), however, believes that educators are as critical and as central in the assessment process, as learners. The educators can be facilitators in the assessment process, as well as the actual assessors who, together, with students and groups, evaluate performance.

2.10.3.4 Proposed assessment processes

Herrington and Herrington (1998) suggest an approach that is based on the identification of the essential elements of every PBL project, to help alleviate assessment challenges. They state that, with every PBL activity, four key elements must be defined. These are the context, the student's role, the activity and the performance indicators. In Herrington and Herrington's views, the assessor should make clear the content of the study, which is the nature of the problem, the part that the student should play in solving or addressing the problem (e.g. group leader, presenter or researcher), the various acts that will be carried out in the process and, finally, the indicators of success or failure. In the views of

Glasgow (1996), however, there are three elements instead of four, and these are the content, the process and the outcome. Students will be assessed on their grasps of the nature of the problem and their apprehension of it, the processes they would have followed in solving it and, finally, their result. Thus, Glasgow (1996) agrees that assessment should not only focus on the result or outcome as in traditional approaches.

While Glasgow (1998) and Herrington and Herrington (1998), established elements in PBL student evaluation, Macdonald and Savin-Baden (2004) present a set of assessment ideologies they believe will help in establishing effective rubric in PBL. These are:

- It should reflect the real-world practice and norms that students will, in future, find themselves in;
- It should show how the student's practical application changes over time;
- It should make students aware that, even when they leave school or college, similar or related assessment criteria will be applied to them by society;
- It should capacitate students to objectively assess themselves and determine courses of action that will identify observed knowledge and expertise gaps;
- It should be aligned with key elements, i.e.: learning objectives, student expectations and learning methods and processes.

The above assessment guidelines put both the assessor and the student at the centre of the process, and also prepare the student for the world of work, where they are regularly assessed in one way or another (Macdonald and Savin-Baden, 2004).

2.11 Resources and PBL implementation

McLoughlin (2005) notes that the successful implementation of PBL curriculum requires an availability of resources, such as personnel, facilities and financial capital. Carrera *et al.* (2003) also confirm that PBL strategy implementation requires adequate numbers of qualified educators and facilitators. In their study of staff comparisons between PBL and TDL, Kruseman *et al.* (1997) conclude that PBL required more academic staff, compared to TDL.

Fincham and Schuler (2001), commenting on the work of Savin-Badin (2000), suggest the need to involve librarians in the planning process of PBL to ensure that library resources can be ready and accessible to support student learning, in terms of e-learning resources and the internet. McLoughlin (2005) is of the view that, since the PBL curriculum requires an interdisciplinary approach that calls for horizontal and vertical integration of content, institutions of higher learning should provide more financial support for transformation from teacher-centred to PBL or student-centred instruction. This support should also avail physical resources, such as seminar rooms and library materials, as well as staff time (Yilmaz, 2008:34).

Since PBL curriculum is organised around the small group sessions in seminar rooms, this necessitates and has implications on capital budgeting requirements for schools and faculties wishing to change to the curricula, or where there is a need to take large number of students (Savin- Badin, 2002). Establishing a university programme based completely on PBL is resource-intensive. Categorising the cohort of students in 15 groups applies substantial constraints on organisation and scheduling. It has to be taken into consideration that, for this type of teaching, a proper number of little rooms, with essential equipment, is required in order to allow the group members to face each other. Problem-Based Learning is staff-intensive for faculty, as every tutorial group has to be followed by a tutor.

The literature reviewed revealed that good financial management is another beneficial factor in change management during PBL implementation. Admittedly, implementation of PBL demands many resources, and the managers of an institution should allocate funds properly to meet such needs.

Higher education institutions have, in the last few years, suffered from reduced budgetary allocations from governments and pressure to increase participation/intake of students. This trend has consequently affected the availability of physical resources, such as seminar rooms, libraries, programme development and staff development programmes, which are all essential in the successful implementation of PBL (Savin-Badin, 2000). Where there are insufficient resources, the programmes are likely to fail (Carrera *et al.*,

2003:801; Wood 2004:22). Though the university embarked on a series of fundraising campaigns, the issue of inadequate funds still adversely affected the success of the PBL programme (Carrera *et al.*, 2003:801).

2.12 ADVANTAGES OF PBL

Several scholars generally agree that PBL, as a teaching and learning process, comes with many advantages for the student, the facilitators and society that is expected to get service from students upon their graduation. This section concisely discusses some of these advantages.

2.12.1 Bridging the theory-practice gap

The process of preparing future graduates should include much more than just presenting theoretical frameworks. Students and their institutions need to be conscious of the age-old theory – practice divides and then works towards bridging that gap. PBL approaches support the development of deep practical knowledge amongst students, through the use of various mechanisms (Ribeiro, 2011:3-4). Firstly, the use of cases or problems as central learning tools puts students in a practical, real-world scenario, as they learn. Cases drawn from reality, quickly engage students into the same reality and, in addition, challenges them to deal with cases as if they were actually part of the management or technical team assigned to address the problem (Azer. *et al*, 2014; Davis & Wilcock (2003:1-7). Case studies, therefore, bring reality into the classroom and implore students to learn from and contribute to real-world solutions. In addition, the following characteristics of case studies assist in bridging the reality and theory gaps (Azer. *et al.*, 2014; Davis & Wilcock, 2003:1-7).

- They are drawn from real-life situations;
- They require real-life solutions;
- They empower students to facilitate the solution creation process by making them leaders of the path towards a solution;
- They challenge the development of contextual knowledge around the problem.

The effectiveness of case studies, in facilitating the narrowing of the theory-practice gap, has been observed in the medical fields of both South Africa and the world. Medical students, due to concentrating more on cases than theory, were able to apply theoretical knowledge more effectively to patient situations. However, there has been a degree of criticism on the theory-practice gap-bridging aspects of PBL. Some scholars vehemently argue that this not a guaranteed benefit of PBL and, in fact, depends on many other variables, including the management and implementation of the PBL process, the student characteristics and nature of the cases that are given to students.

2.12.2 Improving of communication skills among students

Communication skills enable students to interact and effectively connect with other members of society, including with other students. Communication skills in PBL work on two levels: firstly, they are developed to enable students to cope with PBL's highly interactive processes. Secondly, they are developed to help students in the professional world (Ustun, 2006:421). Thus, a PBL approach integrates students' current communication skills needs with future communication skills needs – overall, producing better communicators than those produced under traditional teaching methodologies (Wood, 2003:328).

Critical communication skills can be broken down into sub-skills, as listed below (Peterson, 1997:2):

- Listening skills;
- Discussion skills;
- Dialogue skills;
- Consensus building communication skills;
- Comprehension skills;
- Non-verbal communication skills;
- Person-to-group speaking skills (presentation skills).

The above-mentioned skills improve students' capacity to convey and receive both literal and abstract information from other parties. These skills help students in both the academic and post-academic environments, including in the professional and social spheres of life (Ustun, 2006:421). In addition, if students will eventually end up in a professional field, where communication is critical, as in the medical fields, adequate skilling in communication is a dire necessity.

Under a PBL regime, group discussions, group presentations and group assessments improve the communication abilities of students quicker and more effectively than in traditional, lecturer-centred pedagogy, where the lecturer does most of the active communication while students listen (Ustun, 2006:421).

2.12.3 Conflict management skills

Peterson (1997:4-8) also believes that, under PBL structures, students developed conflict management and consensus building skills. This was mainly because group discussions, and group work in general, challenged students to negotiate for options which they believed represented the best courses of action. Musa *et al.* (2012:567), imply that conflict resolution skills were imbedded in other skills that students developed, these being communication skills, peer interaction skills, group interaction skills and project management skills. Since not all students will agree with a particular way of thinking or way of doing things, there was always a need to negotiate a compromise position (Wood, 2003:328). Lack of agreement, under PBL, could constitute a conflict position which would call for dialogue as a way of getting a resolution. In post-academic life, the same skills are important in managing diversity, with its regular lack of consensus and regular disagreements. Ustun (2006:421) also touches on consensus building skills but classifies them as part of broader communication skills, by adopting a view that conflicts concerning courses of action are resolved through communication.

2.12.4 Team and group management skills

Group learning requires the management of group operations and the maintenance of group relationships. These two requirements imply that in PBL, students are the managers of their own groups (Peterson, 1997:3-4). Peterson goes on further to outline some group functions that students take responsibility of under PBL. These are:

- Ensuring that group projects are done in time;
- Ensuring quality of group projects and presentations;
- Sharing of tasks amongst group members;
- Keeping track of group progress on the completion of tasks;
- Ensuring that existing conflict is resolved;
- Managing meeting places, times and other smaller logistics;

Groups may assign leaders or may operate without a predetermined leader with different members taking leading roles for different aspects. All the same, groups need to be maintained (Azer, 2005:676). In the process of managing and maintaining groups, as previously stated, students develop important skills (Wood, 2003:328). However, in cases where groups are poorly managed and there is unwarranted or uncontrolled group dominance, PBL processes may fail to effectively impart the above-mentioned skills to the wider group community (Emerald *et al.*, 2013). It is, thus, important to ensure that groups are properly constituted and oriented, so that issues of dominance are addressed.

2.12.5 Leadership skills

Within group contexts, leaders naturally emerged due to necessity. At times, it was necessary for a particular group member to take charge of the group operations and maintenance issues, discussed above (Peterson, 1997:6). At times, leaders emerged from groups through consensus, i.e. through members wilfully agreeing that a particular member should take charge of a certain aspect of the group. This oriented students in preliminary leadership skills that they could also further develop, as they progressed through their studies (Wood, 2003:328).

Peterson (1997:7) further states that even the unfortunate group dynamic scenes that may occur during the preliminary PBL phases, are critical in leadership skills development. Lack of interest from other team members, as a result of dominance, can teach that every group member needs to be awarded an opportunity to fully express themselves. Additionally, poor group integration can teach students that groups are dynamic, and that leadership skills that appeal to this dynamism need to be put in place. Hitchcock and Anderson (1997:20) state that, without group direction, supported through consensual types of leadership, it was easy for groups to sway from their objectives and fail to achieve learning objectives. Like Peterson, they also stress that, while group leadership is necessary, it should not be imposed on members, and should not result in the dominance of certain persons over group.

2.12.6 Problem-solving skills

Problem-solving skills are one of the most emphasised competences that PBL imparts to students (Ribeiro, 2011:3). Problem-solving competences have been described as lacking in today's workforce, making employers and academia take an interest in how these can best be developed amongst students (Kadir, *et al.*, 2016:166). Generally, problem-solving is the overarching skill that students are expected to acquire through their PBL experiences. Under PBL, students approach problems in a number of ways, one of which includes the following, according to Musa *et al.* (2011:574).

- Identification of a problem from case scenarios;
- Detailing of the problem;
- Breaking down the problem into finer parts;
- Coming up with alternative solutions through primary and secondary research;
- Establishing a solution;
- Motivating or justifying the solution.

In Musa *et al.*'s views, students developed the above-mentioned skills from every single case or project they dealt with, making problem-solving benign to everyday learning. Yu *et al.* (2010:187) further states that PBL makes problem-solving interesting to students,

and this developed interest was important in the development of the skill. By the time students are done with their studies and are ready to go into the professional world, they would have developed intense solution-creation skills as a result of their everyday experiences with PBL (Ribeiro, 2011:3). In confirmation, Kadir, *et al.* (2016:166) also state that there is ample proof from PBL experiments that PBL sessions enabled students to solve problems more effectively, than traditional learning sessions.

2.12.7 Contextual knowledge

PBL processes have been argued to improve student's contextual knowledge in learning subject matters. Students learning through practical means, through querying phenomenon in the real-world, obtained a deeper understanding of study content than those who solely relied on theory. Students from PBL setups were also able to recall the concepts for much longer periods, as PBL helped to commit concepts more effectively to the students' memories (Ribeiro, 2011:12-13). Due to the fact that students integrated theory learnt from textbooks and practice from cases based on real-world occurrences, they were able to recognise the relevance of contextual knowledge in their studies, and were able to compare theory against reality. This means they developed the ability to critique what is said and what is real and, in the process, also obtained a complete understanding of the contextual knowledge that formed part of their curricula (Woods, 2003:329-330).

2.12.8 Interest in learning

Some scholars argue that PBL resulted in a generally positive change in attitude towards learning, among students (LaForce, *et al.*, 2017:1). They studied the effects of PBL on science students, and concluded that students' actual interaction with problems and cases posed under PBL, made science subjects both interesting and easier to comprehend. LaForce, *et al.* (2017:1), linked PBL to an increase in student's intrinsic learning motivation, as the ability to achieve results by pursuing practical means made students feel good about their sense of achievement (Woods, 2003:328). Another pair of scholars, Rotgans & Schmidt (2012:85), also concluded that PBL motivated students to

participate more in the learning process in comparison to traditional learning means. They cited the factors that were responsible for these positive levels of motivation, namely, the feeling of being in charge, the practical nature of achievements that came out of learning, the ability to interact with others while learning and also the ability to understand learning content better.

2.13 CRITICISMS OF THE PBL APPROACH

Despite the discussed merits of PBL, the process is not void of weakness. Several scholars have researched on the weaknesses of PBL, including its perceived disadvantages when compared against TDL. The purpose of the following sub-sections is to highlight some of the weaknesses and criticisms encountered during Problem-Based Learning strategy implementation. However, these must neither be regarded as being exhaustive nor as reasons for opposing Problem-Based Learning, but rather as essential problems which merit further research and close attention.

2.13.1 Poor high-content coverage

One of the weaknesses discussed in literature is that PBL is not always effective in high-content coverage (Kain, 2003). Kain further explains that, as students concentrate on researching about information that aids them to address the given problem, their focus of developing and accumulating key theoretical concepts suffers. Study areas that consist of high-content volumes and detail may, thus, suffer if PBL is applied as the main mode of teaching and learning (Kain, 2003). In agreement, Vernon & Blake (2003) state that conventional pedagogy is better-rated for covering educational material in detail as well as in assessing students' grasp of this content. In contrast, in a study by Ates & Erilymaz (2011), students revealed that the content to be learnt under PBL was actually too much for them, disputing the view that PBL exposed students to low-learning content.

2.13.2 Unproven superiority over traditional T&L

Some scholars have based their criticism of PBL on the view that PBL students, as proven by research, do not always outperform those educated through a traditional didactic approach, including in areas of problem-solving. In a study to compare performances of PBL students versus those who were educated through the traditional didactic approach, Beachery (2007:1500-3) found that employers rated students who had been educated through TDL as better performers in problem-solving, procedural compliance and communication – capacities that are argued to be more associated with PBL than TDL. Contrasting this, Maurer, Reithler and Brunotte (2011) point out that PBL not only consists of the course content but also places a powerful emphasis on development of skills, making PBL-taught graduates much more skilled than TDL-taught graduates. While this is regarded as a strength and benefit of learning through Problem-Based Learning, experience reveals that students embrace respective skills only in rare cases, in an intentional way, on their own. Smith *et al.*(2013:217-18), in disagreement, state that coming from a PBL approach-offering institution was not a guarantee that one would obtain employment, but it increased graduates' employability. The latter go on to recommend the implementation of PBL approaches, as it rendered students more competitive in the job market. Students, according to Smith *et al.* (2013:217-18), appreciated PBL because of this particular advantage.

2.13.3 Lack of operational efficiency

PBL has also been criticised, in terms of its operational efficiency. In the views of Delafuente *et al.* (2004), PBL needs a lot of planning by the facilitator, in comparison to traditional teaching methods. Dolmans *et al.* (2005) also agrees with this view, citing the preparation of cases as a possible cause of learning inefficiency. Chapman (2011) states that a lot of work goes into creating a quality problem that relates to real-world situations. Any cases or problems that are not testable in real-life will not be meaningful to students. The process, as a whole, may make it impossible for teachers to complete syllabi, as a lot of time would have been lost to preparation of cases, group presentations and

discussions. Both students and teachers report that PBL creates time constraints by elongating the learning process, while the syllabi remain static (Ates & Erilymaz, 2011). Additionally, time constraints resulted in the preparation of poor cases, that resulted in students not receiving the full benefit of PBL (Ates & Erilymaz, 2011).

2.13.4 Excessive dependency on student's abilities

Due to the fact that PBL operates on the presumption that the students control the learning process and, therefore, determine what they need to learn, PBL processes may suffer if students are not sure about what knowledge they want to develop (Albanese & Mitchell, 2004). In addition, while students may know what they want to learn, this might be irrelevant to both the learning and assessment processes (Kirschner *et al.*, 2006). Delafuente *et al.* (2004) suggest that unless a strong theoretical background is infused in students, they will not be able to know what they need to learn and they will, additionally, not be able to solve cases they would have. This means that PBL cannot fully sustain itself outside of conventional teaching, where the background to problems is developed. Furthermore, because PBL is student-centred, more is required and expected of students in delivering a successful PBL lesson or learning session. Unfortunately, students have been reported to come to the sessions poorly prepared, or unprepared, and this means that no meaningful learning interaction will take place (Ates & Erilymaz, 2011). In addition, students sometimes simply do not show any interest in learning or driving the lesson, also making it possible to conduct PBL classes (Ates & Erilymaz, 2011).

2.13.5 Unfavourable group dynamics and personality issues

Emerald *et al.* (2013) cite student personality issues, particularly undue dominance in group discussions, as disadvantages of PBL. This type of behaviour discourages full participation by other students in resistance. Furthermore, some students were generally passive and naturally unwilling to take part in group learning (Emerald *et al.*, 2013). Group dynamics may also be negatively affected by personality differences that may make effective group integration a difficult task. Some students may naturally remain passive, due to their personalities, and may not appreciate being open (Wijayanti, Irawanto &

Murti, 2010:194). However, Mpofu *et al.* (2009:421) believe that unfavourable group dynamics are a result of faculties of learning failing to develop these amongst the students. Therefore, they suggest that group co-ordination is a skill that could be infused into the studentship.

2.13.6 Low acceptance by educators

There are also views that PBL, as a teaching mode, suffers from low acceptance from teachers. This is because of its role-reversal mechanism, where the teacher stands in as an assessor, while the learning process is being directed by the students (Schmidt, 2003). Additionally, the concept that students determine what they want to learn is generally viewed as one that would weaken the hegemony of teachers. Teachers are accustomed to leading and controlling the learning process, as well as taking the roles of student evaluators. Under PBL, this change in basic assumptions, where students control learning, is considered too radical by many educators (Schmidt, 2003).

In a study by Ates & Erilymaz (2011), it emerged that some tutors, who were part of a PBL exercise, indicated that they were highly demotivated by the process, specifically the issue that it empowered students more than them. In the same study, tutors were reported to come to PBL sessions without being prepared, and did not intervene much to help students deal with the cases they had been given. Additionally, 50% of the students in the study were dismayed by the fact that their tutors were not interested in PBL. The above is a highlight of personal motivational issues that a PBL setup may bring. Kong (2012), however, advises that resistance to PBL at its inception is a common phenomenon. Perceptions change positively as tutors are exposed to it over time.

2.14 PBL IN CREATING A SUSTAINABLE LEARNING ENVIRONMENT

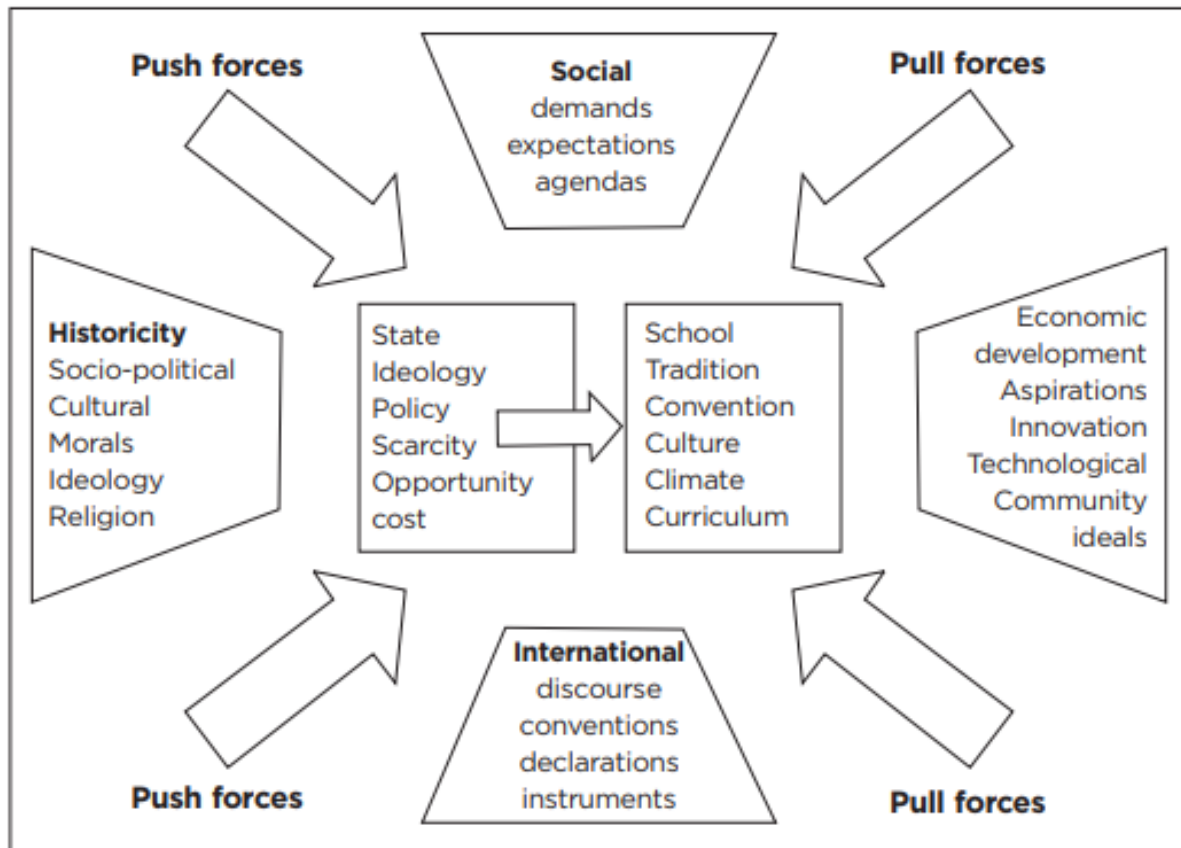
Earlier in the study, PBL was connected with a sustainable learning environment, which is one where social justice pervades, amongst other qualities, such as equality. To build on this argument, this section looks at the relationship between PBL and social justice.

2.14.1 Social justice in education

Social justice can be defined as a status where a society enjoys equal distribution of privilege and opportunity (Parsons, 2018:1). It has also been defined as a state of equality in social, economic and political participation, based on need (Bell, 2007:1). Nieuwenhuis (2010: 269) comments from a South African perspective, adding that mere participation in the national sphere was not adequate for social justice. There is a need to ensure that the marginalised and underprivileged are availed with resources that can enhance this participation. The author distinguishes between the creation of an environment where all citizens enjoy the same levels of equality and the actual provision of resources to create equality. The provision for affordable, quality education, for example, is one way that social justice can be facilitated, as opposed to simply passing laws that give all students equal access to education.

To further illustrate the relationship between social justice and education, Nieuwenhuis (2010:282) presents the following model that relates education and curriculum issues to broader societal, economic and political factors.

Figure 14: Nieuwenhuis' social justice in education framework



(Source: Nieuwenhuis, 2010: 281)

Education takes a social justice role, as a result of the interaction of push and pull factors from the external environment. The factors that push education to transform itself are political, historical and social forces. The education sector is pushed as a result of direct pressure for it to change and adopt more acceptable social integration standards. In South Africa, the need to address the injury that was caused by Apartheid education, and Apartheid in general, is a strong push factor that challenges institutions to transform through adopting socially-justifiable teaching and learning regimes. Pull factors relate to forces that encourage the educational system to adopt social justice. These include the need to meet economic development needs and the expectations of societies. The educational system adopted to both pull and push forces, by making changes to the curriculum, educational institutions, cultures and conventions, among others. PBL was one of the changes that the educational system made (Sommers, 2014:7).

Sommers (2014:7) contends that social justice can be defined from an educational perspective. Under this perspective, it is the creation of an educational system that is accommodative of diversity, and propels society towards the attainment of various equalities and privileges. In Hackman's (2006:103-106) view, five educational tools can be used in the teaching or infusion of educational content with social justice. These are critical reasoning, self-consciousness, diversity tolerance, content apprehension and practical application of theory. However, Hackman also states that the above tools can be applied in any pedagogy, as long as it assists in transforming the students' mind and views on justice and equality. PBL and social justice proponents, such as Zavalkoff (2016: 151), however, argue that only within a PBL environment can social justice education have a real impact on society.

2.14.2 PBL and social justice

PBL, as noted from the literature, can be applied in the teaching of various subjects, subject matters and courses (Zavalkoff, 2016:151). Some scholars have suggested that PBL can be used to appeal to social, political and historical matters of social justice. Firstly, PBL can be used as a method of teaching students in social justice matters. This relates to the content of learning, i.e. learning about oppression through case research. Secondly, PBL can be used to develop social justice expectations in learners through the learning context, i.e. how they interact as they learn within diverse class communities (Zavalkoff, 2016:151). In agreement, Parsons (2018:1) states that the interest in applying PBL, as a mode of instruction of social justice matters, is increasing.

Zavalkoff (2016: 151) asserts that, as a pedagogy, PBL facilitates the teaching and learning of social justice issues within the academic context and beyond. Educators struggle to instruct students on various social justice matters, including oppression and equality. Educators do not only struggle with the content of these issues, but also the context or processes that must be adopted, given student diversities. However, under a PBL pedagogy, educators and students are able to apply their own experiences, beliefs and values in studying racial, gender, and economic diversity issues (Guthrie & McCracken, 2010:76-85). The role of the educator becomes that of facilitating the flow of

personal experiences among students, and facilitating dialogue and greater integration, despite these diversities (Guthrie & McCracken, 2010: 76-85).

2.14.3 PBL and Social transformation

Some scholars share strong views that the type of pedagogy that higher institution students are exposed to affect their ability to transform society. One such scholar, Summerlee (2006:406), argues that PBL, as a pedagogy, positively develops the capacity to socio-economically and politically transform the world. Summerlee further argues that TDA was not a mode of learning that was particularly conducive to social-transformation. This is because it suited students who have been exposed to knowledge under favourable learning conditions. Most students from the developing world, for example, were not exposed to academic concepts that formed the basis of many disciplines. The use of PBL was seen as a socially-just measure, as students who have not been highly exposed to academic concepts would also be able to cope – since PBL drew upon students' experiences in learning. PBL also caters for diversities amongst students, including more varied economic backgrounds than TDA, due to of its constructivist and personal-experience focus (Summerlee, 2006: 406). Contrary to this view, however, some scholars believe that PBL was actually exclusive, as it catered for students who came from well-resourced academic environments, where self-learning resources were also available (Yilmaz, 2008:34).

In South Africa, current higher education curriculum-related processes have not managed to bring about the right quality of socio-economic transformation (Reddy, 2006:121). Whilst higher education has brought some social changes to South Africa's post-apartheid social structures, it has not been able to reduce inequality in the educational sector, nor in society in general. Reddy (2006:121-122) asserts that the educational system has reproduced a black middle class social group, that has not been able to bring any further transformation of ordinary South Africans besides itself. In other words, higher education output has simply replaced a repressive white minority with an equally-repressive black minority. Reddy (2006:124) puts the blame on the failure of the educational system to produce graduates who can positively alter and direct national

policy towards greater transformation, that will end poverty and economic repression for all, on top of providing equal educational opportunities.

Reddy (2006) is not the only scholar who believes that the educational system has missed its transformative expectations. Various South African writers expect higher education to exhibit and lead in the positive change across three main transformation spheres (Weber, 2010:iv; Faulkener & Lauweld, 2008:10):

- Economic transformation: economic growth and development, employment, entrepreneurship, wealth and resources ownership;
- Social Transformation: Gender, Race, Ethnicity, Religion diversity and harmonisation;
- Political Transformation: human rights and freedoms, democracy and freedom.

Transformation is centered on removing barriers that include marginalisation and segregation in national participation (Faulkener & Lauweld, 2008:10). The quest for transformation through education was higher among black students and educators during Apartheid, than it is now (Weber, 2010:ix). Back then, they fought for inclusion and against dominance by race in both education and society. Weber bemoans the fall of the transformation goals in the current education system, arguing that racial integration in education and the deliverance of equal educational opportunities still remain a dream.

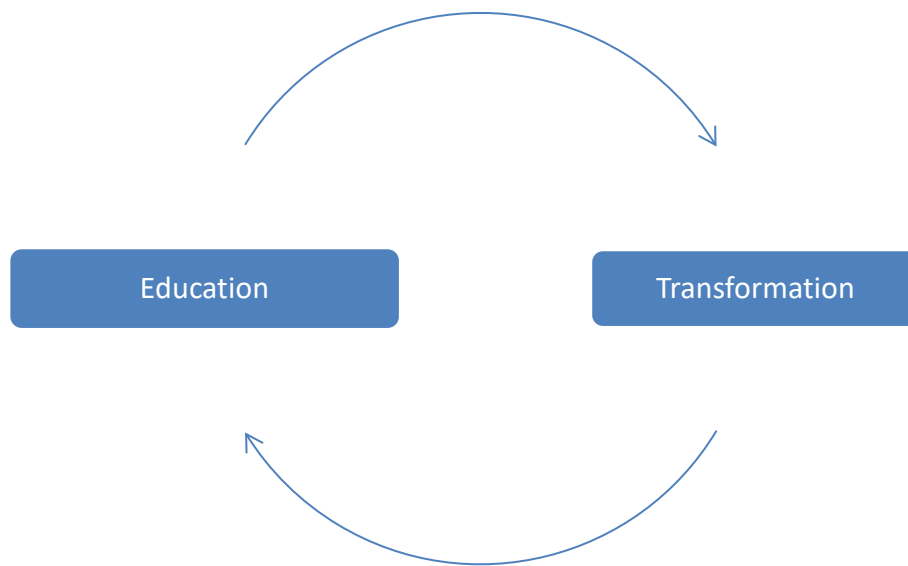
Higher education should inspire transformation within its folds and then spread the same across South African society, through producing graduates who will champion transformation through effective, social justice-based contributions in their various professions and social domains (Weber, 2010:iv). Weber also states that the role of education in transforming society challenges the educational system to transform itself first. In other words, it must desegregate itself and remove privilege based on race and elitism. Students from poor communities must fit into the educational system and be able to effectively participate in it, firstly in transforming themselves and secondly, in transforming society.

To zero in on the above with a personal remark, the educational sector must:

- Transform students into conscious, concerned and competent citizens who can tackle social justice and transformation challenges of South Africa;
- Transform itself to accommodate and develop students from all backgrounds, regardless of race, gender or social class.

All illustrated in the simple diagram below, education can transform society. At the same time however, education itself also needs to be transformed.

Figure 15: Education and Transformation



Source: Researcher's own

Education as a force for transformation must, therefore transform itself first, and then it will be able to transform society. PBL and any other mode of teaching and learning that support this transformation must, therefore, be strongly supported.

2.14.4 Transformation through diversity

Under PBL, students work closely by collaborating with one another, making a real diverse and truly multicultural and multilingual population of learners, in the forms of groups or teams (Eva, 2002). Kolmos (1999) agrees that the learning process in this

instance creates an opportunity for students to develop personal competencies. According to Opitz *et al.* (2006:95), this setting of PBL, namely, the small group team, may go beyond its academic purpose and expose students to diversity they are likely to encounter in their real-life situations, as well as in professional practice. This is more important for South African educational and social environment contexts, where a segregation-driven, separation-driven and repression-driven history affects the current learning contexts. Therefore, the small group element of the PBL may be of more importance in socialising these group members with different gender, educational and social, cultural, ethnic, language and religious backgrounds.

A sustainable learning environment (SLE) as previously discussed, is one result of educational transformation (Mahlomaholo & Ambrosio, 2013:8). Firstly, PBL facilitates this environment by supporting diversity and inclusivity in learning. This is through the appreciation of different backgrounds of learners and accommodating for these differences in the learning process. Secondly, PBL churns out students who, through their content knowledge, cognitive capacities, skills and experiences, are able to effectively contribute to positive social, economic and political change – thus being part of the transformation process (Elseragy, Elnokaly & Gabr, 2011:456).

2.15 CHAPTER SUMMARY

From the above discussion it is clear that implementation of PBL needs more than a change of mindset. While the benefits of PBL appear to outweigh those of didactic forms of pedagogy, its implementation remains a cause for major investment in intellectual, financial and physical resources. It was also noted in the literature that a complete or outright implementation of PBL, as a replacement of lecture-based teaching approach, carries risks, as PBL cannot be assumed to be suitable for all learning areas. In order, therefore, to be successful in creating a sustainable learning environment, PBL will need to be combined with the traditional teaching method, and needs to be applied to only some learning areas, as is traditional teaching method.

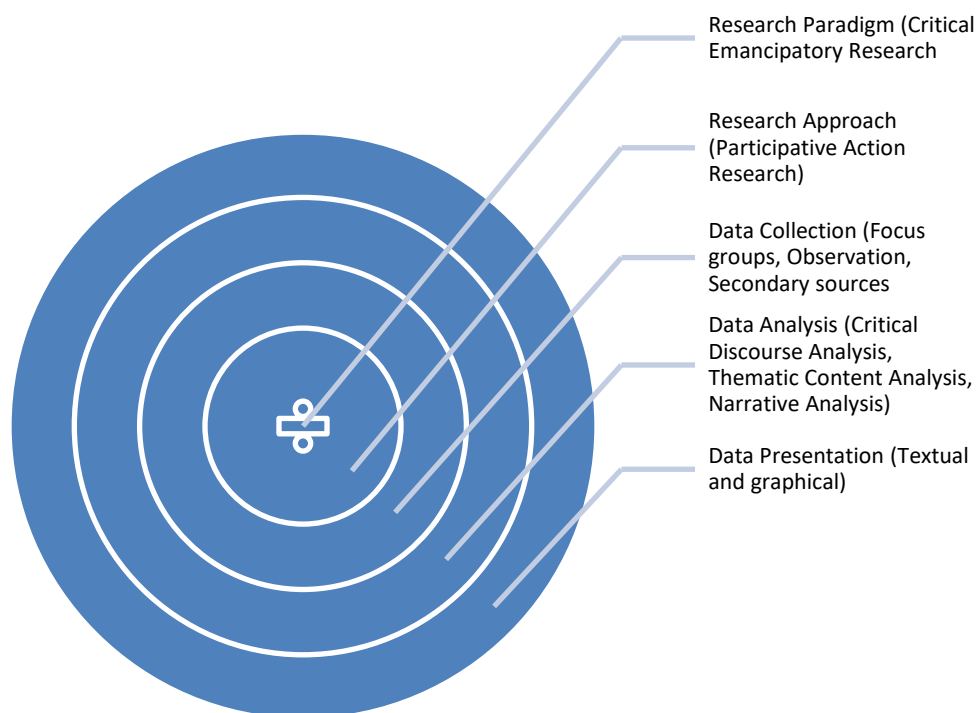
It is evident from the discussion above that students feel more positive regarding their learning experience in PBL than in the traditional lecture-based learning. At the core of PBL teaching, the preceding discussion indicated that there is a need for lecturers or teachers to constantly ignite a spark of curiosity in students, so that the students can be motivated to embark on a journey of finding or researching answers/solutions to real-life problems presented to them. It was also noted that, in order for teachers to be successful facilitators in PBL, they need to also be life-long learners, constantly involved in research, which will help them during the problem design and formulation phase, as well as during assessment. The next chapter identifies, explains and discusses methods and processes that were applied in further research done on the implementation of PBL, from an empirical point of view.

3 CHAPTER 3: RESEARCH METHODOLOGY AND DESIGN

3.1 INTRODUCTION

Chapter three gives the details of the systematic approach to the research process that was used for the study. This chapter is divided into four sections. The research aim and the research question and objectives are presented in the first section. The second section includes a detailed explanation of the research design, couching the study. The third section expositis the research methodology used in this study, as well as the rationale for using such a methodology. This chapter also contains operationalisation of the methodology, in terms of the intervention, participants, data collection and analysis of data. Lastly, it ends with a recap on the aim and ethical considerations which were used in the research, in addition to a short recapitulation of the chapter. The diagram below is meant to guide the reader on the methodological choices that were made by the researcher, and that are discussed in the chapter.

Figure 16: Research Methodology Outline



Source: Researcher.

3.2 QUALITATIVE, PARTICIPATORY ACTION RESEARCH AND OBJECTIVES

Literature reveals that institutions of tertiary education are faced with the challenge of making a paradigm shift from the “traditional” teacher-centred mode, to a mode which is characterised by knowledge, problem-solving, trans-disciplinary, heterogeneous and network-embedded (Buswell, 2009). In the literature reviewed, the need for eloquent, realistic approaches that theorise models of the development of independent learners was identified (Nisbet *et al.*, 2005). Hence, this study intends to create a framework for the implementation of PBL at an institution of higher learning, under the view that this will facilitate or create a sustainable learning environment. It is also anticipated that the study will display and justify the need for the implementation of problem-based learning. Additionally, it is expected to identify components, conditions and conducive scenarios

for the implementation of the PBL framework. It will also aid in anticipating the risks that may affect PBL implementation.

Qualitative research is an inductive, comprehensive, process-directed methodology that aims at providing descriptive, explanatory and exploratory information for theory development or situation understanding, based on subjective perceptions from a naturalistic setting. (Morse & Field, 2002:199; Grove & Burns, 1998:35). Brink & Wood (2001:335) describe qualitative research as “methods of organised analysis related to comprehending human beings and the character of their interactions with themselves and with their environment.” In addition, Holloway & Wheeler (2002:30) describe qualitative research as “a type of collective investigation which focuses on the way people construe and add up their familiarities in the world”. Qualitative research is employed by researchers to discover the conduct, viewpoints, experiences and emotions of individuals, and focus on comprehending these aspects. Analysts who employ this method use a holistic, people-centred and humanistic perspective to comprehend peoples’ experiences (Morse & Field, 2002:199). The focus of this study was the experiences of the participants from their own perspective. In order to attain their point of view, the author was engrossed in the research. The involvement of the analyst in the research added to the exceptional nature of collection of data and its analysis, in full subscription to Critical Emancipatory Research and Participative Action Research expectations (Streubert & Carpenter, 1999:17).

Qualitative data gathering techniques are well-suited to gathering information from verbal and written reports, noticeable attributes and providing details that, generally, cannot be expressed numerically (Brink & Wood, 2001:5). Such was some information from the study that was collected through observation, verbal and written reports and oral discussions. The qualitative approach, in the form of a case study of the Tshwane University of Technology (TUT), was appropriate to capture the descriptive accounts, beliefs of the beneficiaries, mainly students, on the effectiveness of PBL as a mode of teaching and learning.

The research study brought together different role players, including lecturers, industry representatives, department heads and the students themselves. These parties also shared their perceptions and experiences on the subject matter of PBL. The researcher was of the view that, with a qualitative approach, these views and experiences were more likely to be effectively presented in a naturalistic, subjective tone, supported by a qualitative methodology. Additionally, a qualitative approach supports open dialogue and discursive methods that augur well with the ambits of participative action research and Critical Emancipatory Research (Schmidt, 2012:226; Veale, 2005:254). The view by Kemmis *et al.* (2002:125) that PAR is a form of collective, self-reflective inquiry, where study respondents undertake to change the status of the social or educational practices, also aligns PAR to qualitative methodologies, especially concerning the naturalistic settings and subjective output need.

3.2.1 Participatory Action Research

Scholars and researchers have defined and classified PAR in a variety of way including by its objectives, suitability and benefits. This section relooks PAR as a methodology chosen for the study with the view of justifying its relevance and suitability for the study.

3.2.2 Views and definitions

PAR is an investigative technique, characteristically related to institutional self-evaluation, in which the research participants are engaged with the professional analysts throughout the investigative process, from the beginning planning phase to the ultimate presentation phase, where their views and experiences are expressed (Danley & Ellison, 1999:1). In Mouton's view (2001:150), PAR involves the subjects of research (research participants) as an integral part of the design. In agreement, Turnbull *et al.* (2002:178) states that PAR is a procedure where the investigators and the beneficiaries of the research work together in designing and carrying out all steps (such as structuring questions and structuring how data is to be collected, analysed and presented). Babbie (2005:309) and Marshall & Rossman (2006:7) also support the view that collaboration of the researcher and the research beneficiaries is an important hallmark in PAR.

3.2.3 Objectives of PAR

PAR exercises generally exhibit two main objectives; the first of which is construction and transmission of information through considerate preparation, implementation and retrospection. The second objective is to capacitate key players and those participating, by instilling thought-provoking and prevailing discourse ways in which information is generated (Reason, 2006:190). Notably, the procedure of preparation, implementation and retrospection is iterative, and “it is a process of being aware of one’s self which is through shared inquiry of self and retrospection” (Reason, 2006:195). As such, PAR offers a deviation from conventional top-down study methods, by stressing dialectical and dialogical procedures of study (Reason, 2006:190). This method enables the researcher to draw on the dormant information present in societies. This process provides important links between theoretical investigations and communal acts. The two objectives are on par with the expectations of the study, which is to transfer or develop knowledge and awareness of PBL, and to facilitate its implementation, so that it benefits society by way of creating a sustainable learning environment.

3.2.4 PAR processes

Scholars also discuss the PAR process. PAR is described as a “cyclonical procedure”, characterised by interaction between the investigator and research participants in a relationship that moves back and forth between research steps (Cahill, 2004:278; Herr & Anderson, 2005). Serious self-reference is the core of the recurring course. It allows the investigator to continuously act on a new relationship and subjects it to a lively and continuous investigative cycle (Dowling, 2005). Participants also grow the skill of important retrospection on their acquisition of information and participation through facilitation (Senge, 2005). Such facilitation needs an elevated level of skill and dexterity, which can be enhanced by an investigator’s continuous self-reference (Dowling, 2005; Hansen *et al.*, 2005; Senge, 2006). As such, PAR can work, not only as an enabling procedure, but also a changing procedure.

3.2.5 PAR and PBL-participants empowerment

PAR is deemed to be more empowering to participants than other methods, due to the utilisation of involving approaches that enable participants to take part in information creation, clarification and examination in their cultural and communal context (Veale, 2005:254). Involving approaches, like drawing and charting, alongside other qualitative approaches, such as ethnography, phenomenology, grounding theory, historical research, meetings and focus group discussions, explore the participants' beliefs, cultures and lived experiences as perceived by the informant and the understanding of the past events and deeds through utilisation of their own dialectal. Such utilisation of respondents' own dialectal reveals the fundamental communal structures of their connection to the realm and among them (Hoggart *et al.*, 2002; Winchester, 2005:9).

The blending of PBL and critical emancipatory research calls for retrospective implementation that is qualitative, descriptive, co-operative, appropriate and dialectical (Mfe, 1999). Participatory action research is drawn from and matched with critical emancipatory research, due to its ability to enable the retrospection and implementation of the researcher and respondents, in facilitation (Kindon, 2005; Senge, 2006). Participatory action research is further matched with the Mezirow Inquiry Model of Transformation, which looks at adult literacy and education, as well as experiential learning, drawing on the work of Friere and Habermas (Torbert, 2000:84). As such, the research used participatory action research as a critical emancipatory research approach, so as to gain effective implementation of PBL and create sustainable learning environment practice.

3.2.6 PAR as a source of practical solutions

PAR refers to the linkages between practical action and solutions development on critical social issues and problems. Additionally, it focuses on the empowerment of affected solutions in this practical solutions development process (Reason and Bradbury, 2001:1). It is about the teaching and professional development and empowering of lecturers to write their achievements and change ineffective situations (James *et al*, 2008). PAR looks

to completely involve students in investigation, implementation and retrospection, which facilitates their comprehension of how their realm is organised, their comprehension of inconsistencies that may be realised, and their capabilities when it comes to working collectively, and control what they can to influence it (Schensul *et al.*, 2004). Participatory action research gives the important connection between particular experiences and general ideas, as well as the connection between assessing oneself and growing professionally.

Participatory action research adopts a problem-solving and decision-making approach to create solutions and improve conditions. Through this study, the researcher hoped to bring to the fore the problem of the complexity of effecting the implementation of problem-based learning, specifically towards sustainable learning environments in institutions of higher learning, using Tshwane University of Technology as a case study. To involve participants in taking decisions on how the problem could be solved, the researcher invited the participants into class, where teaching and learning was presented in a problem-based approach for the effective implementation. Video technology enabled the participants to observe the conduct of a four week PBL session. The participants' inputs were built into the model to come up with the framework to assist the effective implementation of problem-based learning. In so doing, the researcher empowered participants to take charge and ownership of the framework, with the view that this would increase their interest in it.

3.2.7 A review of Critical Emancipatory Research (CER)

Emancipatory research is a paradigm that is concerned with producing outcomes that are beneficial to disadvantaged persons and groups (Noel, 2016:1). The researcher interacts with the disadvantaged participants without necessarily dominating the relationship with these participants. Ross and Glass (2008:8-12) state that CER challenges inequalities by questioning current realities and putting a strong focus on positive social change. In Oliver's (2002:2) view, CER's significance in research is driven by the failures of contemporary paradigms in addressing concerns relating to disadvantaged groups. These failures include the inability to fully appreciate the perspectives of the

disadvantaged, the inability to provide practical information to policymakers and, finally, the failure to fully appreciate the challenges of disadvantaged social groups.

In this study, the Critical Emancipatory Research (CER) approach is adopted as the major philosophical guide. The researcher works together with participants in the sample in presenting the need for formulating a strategy to create a sustainable learning environment for a specific higher institution. The social cause in need of emancipation is the creation of a sustainable learning environment, defined earlier as the one in which the principles of social justice and equality are fostered. A successful implementation of the PBL, in the long-term, would result in the emancipation of the majority of the South African population who exist in deprivation, as a result of socio-economic inequalities, that can mostly be traced back to the Apartheid system (Faulkener & Lauweld, 2008:10). This is because graduates churned out by PBL systems are expected to have social justice critiquing, as well as solution development skills and capacities that go beyond their immediate work environments. These graduates are further expected to be active and responsible citizens who, through interactive and self-driven learning, are much more appreciative of the social, economic and political challenges of South Africa, and are also a source of solutions for these challenges. In short, PBL is expected to emancipate marginalised and formerly marginalised South Africans, through developing competences that go beyond one's job and that contribute to the development of society, as well.

3.2.7.1 The origin of CER

Critical Emancipatory Research can be traced to the 1920s, when social researchers at the Frankfurt School developed this paradigm, in order to address the unique needs of feminist-related research (Rose & Glass, 2008:13). These needs centred on circumventing the effects of gender oppression on research outcomes – in other words, they centered on the need to promote the voice of women in a world dominated by male researchers. During the same period, the need for a more critical research approach motivated the critical paradigm, centred on the critique of research methods and phenomena. Researchers had noted apparent weaknesses in classical research

paradigms, whose levels of critique did not match new changes that emerged over time. These two philosophical developments (Critical Thinking and Feminism) gave rise to emancipatory research (Rose & Glass, 2008:13). In addition, Chilisa and Kawulich (2012:6) add racial, post-colonial and neo-Marxist agenda in the twentieth century as early motivators of emancipatory research, alongside gender. They are, however, in agreement with Rose and Glass (2008:13) on the effects of the critical school of thought on emancipatory research. Watson and Watson (2013:63), however, link CER to the Critical Systems Theory (CST) school of thought that developed in the 1950s, as a result of the dissatisfaction with existing paradigms amongst social researchers.

The researchers wanted to develop a research philosophy that holistically captured the many various components of social research, and were convinced that the existing scientific methods were not able to handle this (Watson & Watson, 2013:66). The Critical Systems Theory was based on three core principles. These were:

- Critique – the need to effectively critique all the significant aspects of a social phenomenon under study.
- Emancipation – the need to ensure the voices of the disadvantaged are represented in research.
- Pluralism – recognising the multiplicity of research participants, methods and processes and how they affect these studies (Watson & Watson, 2013:66).

CER, in Watson and Watson's views, therefore, emerged as a principle of Critical Systems Theory.

While discrepancies can be noted on the dates, the scholars mentioned above seem to agree on the significance of the critical theories in the development of the emancipatory research paradigm. They also share feminism as a common cause behind the paradigm.

Within a South African context, Nkoane (2012:102-104) discusses CER as a relevant paradigm, owing to the social, political and economic historical circumstances of the country. The author argues that Apartheid created a system where the majority of the citizenry was deprived of social justice. They were, therefore, not in a very strong position to emancipate themselves on their own without some of intervention. A CER approach,

as suggested by Nkoane, is one such intervention. Nkoane (2012:102) goes on to suggest that knowledge must be constructed in a democratic way that engages the participants, if it is to be of use in helping to diffuse identified socio-economic inequalities, and be of use in constructing a nation with social justice as one of its characteristics.

3.2.7.2 The role of the researcher in CER

In Critical Emancipatory Research, the researcher plays an active and participative role that goes beyond just interacting with the research respondents or participants. In Nkoane's (2012:104) words, the researcher should become, "an empathic listener, who is courageous, compassionate about the plight of the marginalised, and who should become closer to the participants to the extent of becoming one of them."

There are views that the researcher's main role in CER is that of interpreting the situation under study (Aasgaard, Borg & Karlsson, 2012:1). The authors further assert that the researcher' in this interpretive role must take a keen interest in the validation of presentations made by the participants while being an equal partner to the participants. The researcher is also not an agent of change and plays no role in attempting to change the situation at hand. However, some scholars, such as Noel (2016:5), Burton (2006:50) and Rose & Glass (2008:13), suggest that the researcher is an active part of the change process and not just an interpretive co-ordinator of the matters under study. In fact, Burton (2006:50-51) labels the researcher as the advocate of any change that is to be driven by the research process.

While scholars have emphasised on the democratic aspect or relationships within an emancipatory study setup, Watson and Watson (2011:72) suggest that relationships often take three forms – unitary, pluralistic and coercive. In unitary relationships, participants share common views about the phenomenon of interest. In pluralistic and coercive relationships, they have multiple but freely expressed views and, in a coercive relationship, there is a dominant section that will be imposing its will upon others. To deal with such scenarios, Nkoane (2012:102) proposes the neutralisation of power amongst the study participants, as a starting point in CER. This creates an environment

where participants feel just as powerful as the researcher and each other. Thus balancing the power situation amongst the participants is a critical role a researcher must play under CER.

In CER, the researcher identifies and puts into action communication processes that support democratic participatory modes (Nkoane, 2012:104; Aasgaard *et al.*, 2012:3; Kramer-Roy (2015:1215). While Nkoane stresses the importance of linguistic effects on the emancipatory participation effects, (Aasgaard, *et al.*, 2012:3) focuses more on the ability to construct narrative and discursive environments that enable participants to openly bring out their views and claims. Kramer-Roy (2015:1215) elucidates that the researcher needs to promote communication across participant groups, as a prerequisite of the emancipatory research process. The above-mentioned scholars state that communication is a role that the researcher must play, without him/her turning into the superior force within the research.

3.2.7.3 The relationship between researcher and researched

Mitra (1998:228) mentions that research in social sciences is done on the basis of human interaction that engages and builds human relationships. Such relationships are represented through qualitative research that includes profound interviews, and responds to personal queries. Fontes (1998:53) points out that, in the context of qualitative research, it is recognised that the researcher has authority over the researched within the research relationship. According to Jensen & Lauritsen (2005:21), Knight *et al.* (2004:237) and Archer (2007:27), the need for researcher integrity and reflexivity in such processes is crucial, as minority groups may not have structures or resources for challenging research that mentions their reality inaccurately. Jensen and Lauritsen (2005:21) and Knight *et al.* (2004:237) points out that diversity within the academia is poorly representative of ethnic minorities, women, and more commonly represents processes and practices that reflect middle-class, white, male values. This creates the risk that such groups' views' may be broadly misrepresented, or underrepresented, in research.

In CER, the researcher also becomes an equal participant in the study, whose demeanour supports the feeling of equal participation (Watson & Watson, 2011:68-69; Aasgaard, *et al.*, 2012:2). This participation ensures that the study does not become only the concern of the researcher (Rose & Glass, 2013:13). In contrast, Noel (2016:5) casts doubt on whether the researcher can, effectively, become part of the participant group. Noel argues that the researcher, by virtue of coming into a society and leading the research process, is already assuming an elite role that can be anti-emancipatory. In Nkoane's view, however, certain personal attributes make it possible for participants to accept the researcher as one of their own. These include humility, empathy, compassion and understanding.

3.3 RESEARCH DESIGN

Grove and Burns (2005:195), describe a research design as a “plan for carrying out a research with full charge of elements that may restrict the legitimacy of outcomes.” The main function of a research design is to enable the researcher to anticipate which relevant study choices one should make, in order to make full use of the legitimacy of the subsequent outcomes (Mouton, 1996:107). Polit *et al.* (2001:167) define a research design differently – as the study's general strategy that responds to the study questions, challenging the study hypothesis, while Parahoo (1997:142) defines it as a plot that details how, where and when information is to be gathered and analysed. With the exception of Grove & Burns (2005:195), the above-mentioned writers associate research design with two things – process of the study and the objectives or outcome of the study. For this study, the research design is the plan that was adopted to ensure that the research processes result in the answering of research questions on PBL and their related objectives. This definition is adopted from Mouton (1996:107), Polit *et al.* (2001:167) and Yin (2003:30), above.

PAR generally falls under the Critical Emancipation Research (CER) paradigm, with its focus on transformative action (Cresswell, 2003:4, 9; Morgan, 2007:48. Morgan 2007:600-70) puts more emphasis on the pragmatic study where the focus is about the qualitative approaches, like interviewing, observing and document analysis. The

participants' perspective was emphasised. Effort was taken to see the world from the involved participants' view, as propounded by CER approaches (Mertens, 2005:15).

This participatory action research design took the form of a case study. A case study is the research of a situation in its reality and/or existing context (Yin, 2009). The case involved conceptualising, designing, implementing and evaluating a PBL strategy in a semester programme at the Faculty of Arts, in the Department of Visual Communication at the Tshwane University of Technology (TUT). It was important for the researcher to constitute participants from which information could be extracted for the study (Merriam, 2002:13). This began with the establishment of the co-ordinating team and the identification of student participants. These were identified as national diploma graphic design students, who were to be engaged in the PAR process.

3.3.1 The co-ordinating team

The co-ordinating team was established to spearhead and facilitate the PAR process (Biesta, 2010:45; Hertz-Lazarowitz *et al.*, 2010:271; Sanginga, Kamugisha & Martin, 2008:699; Kellner, 2000:3, 9). The co-ordinating team was comprised of people who felt the obligation to participate and would, most likely, be available for a period of at least the duration of the study, as encouraged by Van Dijk (2008,353). Their participation began simultaneously with the commencement of the study and went through to the development of the respective plans, development of PBL strategies down to their implementation. The co-ordinating team was put together to help emancipate the participants. It included the students and societies from unjust forms of social relations and gave hope them hope for greater justice for all.

3.3.1.1 Identification of the members co-ordinating team

Communication with prospective participants was conducted on a one-on-one basis, since this was the initial and conceptual phase of the study (Wicks & Reason, 2009:249-250). At this stage, the researcher, as an HOD of the department in the case study, took

the initiative of identifying stakeholder representatives, who could form part of the co-ordinating team.

The selected co-ordinating team was expected to embrace the view that the individual member's equitable contribution would be respected and considerably discussed, as stated by Steinberg & Kincheloe (2010:145). For instance, the team would work together equally to involve and invite support from stakeholders to meet, brainstorm, swap ideas and find common ground and skills, required by the study. In this way, the team members will convincingly assert that they are a part of the study, and this would encourage their contribution and strengthen their commitment to the study (Sullivan *et al.*, 2003:45).

Co-ordinating committee members, as a team, ascertain and collectively write information, generate new ideas and confirm their combined efforts, by mobilising people and change systems and communal cultures (Reason & Bradbury, 2001:10). As education and the increase in information occurs, matters of information belonging to an individual and/or joint publications, are spoken about, together with settlements on distribution and information translation (Israel *et al.*, 2003:79). This process also creates a platform for co-ordinating team members to acquire training skills, significant parts and to ensure the study belongs to them (Koch *et al.*, 2005:100). As the team achieved momentum, matters of reality came out and these created meaningful and practical knowledge that addresses the study subject matter, as opined by Lawson *et al.*, (2003:89). Equality amongst the diverse members creates confidence within the group for shared choices, resulting in their reliance on accuracy, team work, commitment and equality (Whitmore & McKee, 2001:25), as required by participatory action research to facilitate positive change and understanding that can be used to enhance the achievement of human dignity and social justice.

3.3.1.2 Forging common understanding amongst the co-ordinating team members

The process of identifying prospective participants, and the co-ordinating team outlined above, was on a one-on-one basis, with interactions mainly conducted through head of

department and study co-ordinator – who is also the researcher. The participants had mostly not met or discussed PBL before, so it was imperative that they were afforded an opportunity to introduce themselves to the group, to facilitate a process of mutual understanding and to know each other's interests, views and perspectives about the use of Problem-based Learning. This also created a platform to ease tension, alleviate the possibilities of tension, misunderstandings related to individual views and perceptions of the study. In order to ensure prevalence of freedom of expression of views and ideas, participants were encouraged to be expressive and open-minded and to seek any form of clarification pertaining to the study.

The discussions that ensued focused on the main study question and problem statement, and came to consider the programme of transformation of 1997's policy imperatives (DBE, 2011a.:4-5), as well as dominant sustainable learning environments, strategies to deliver teaching and learning, and roles played by lecturers, students, labour and community, in the enhancement of a sustainable learning environment. The co-ordinating team members' diverse areas of work and qualifications further supported sharing their knowledge and understanding of PBL issues from various and diverse standpoints. The issues that were discussed included the need and rationale for a PBL strategy, how it would be developed and implemented, its potential challenges, effects and benefits. The discussions were specific to the TUT context because of the need to introduce outcomes that would be relevant to the institution (Rassi *et al*, 2004:25).

The discussions concerning the study topic and problem statement, as well as the diversity in the team, created opportunities for members to investigate reality in the current learning environment, in order to change it. In interpreting the methods, they could view each other, as well as their deeds in the communal and physical environment, as postulated by Kemmis (2008:130). Part of the data from these discussions provided information for the study and influenced the actions that needed to be taken by the co-ordinating team.

The other individuals who were found to be affected by the actions of the co-ordinating team, and whose voices were heard (de Beaugrande, 2006:31; Stein & Mankowski,

2004:21, Steinberg & Kincheloe, 2010:143), were students, community and the labour market. The former showed up through the students' group work initiatives, which were given to them through a PBL project format. The underlying purpose was to help transform and enhance the sustainable learning environments using problem-based learning strategies, such that it was sustainable (Mahlomaholo & Netshandama, 2010:11-12).

3.3.1.3 Team member's engagement in the study

The engagement of the co-ordinating team members was emancipatory and sustainable, as it was able to effectively bring together the parties that are affected by the current learning environment and its characteristics and outcomes as suggested by Mahlomaholo and Netshandama (2012:40-43). These parties were the students, student representatives, the lecturers, industry representatives and the faculty leadership. Their active participation was important in the process of identifying the learning problems associated with the lecture-centred approach, as well as the needs and potential solutions for the 21st century students, which included PBL.

For instance, the students indicated that the approaches preferred and used for teaching and learning by the lecturers were alienated from their real situations of life. They further indicated that some of the topics they learnt did not have any connection or relevance to their real-life situations. The other contribution was that lecturers used methods that compromised the sustainability of learning environments, and the student representatives later confided that the reason for their performance in presentations being so poor, was because the incentives they got from such activities were discouraging, especially the low marks.

The students', community representatives' and lecturers' discourse identified solutions for the problems raised. The following were suggested:

1. Students should start working in groups;
2. They should focus on resolving the task and problems at hand;

3. They should focus on designing and implementing strategies that would be able to empower them with skills and competencies that would help them to navigate problems and situations of real-life.

The proposed solutions embraced the values of PAR. They were driven by the principle of communal procedures pertaining to collective education, which involved the gathering of people, uniting to transform the actions in the real-world. Stakeholder participation was promoted to increase the relevance of the solutions that were derived, as well as to reduce resistance (Rossi *et al.*, 2004:52).

3.3.1.4 Planning phase of the co-ordinating team

Because of the involving nature of the study, it was important to develop a comprehensive research plan that would also be acceptable to the participants. The co-ordinating team of the study needed to be engaged, so that they would appreciate the objectives of the study, its methodologies and approaches, as well as time-frames and expected outcomes. The researcher was guided by the views of Mertens (2000:239) that the full participation of teams engaged in the study was critical for the production of tangible outcomes. The co-ordinating team plays a critical results evaluation role (Lipsey, 2006). They have a say in whether the findings are really what they expect and in this case, their evaluation of the PBL study was considered crucial in the proposed implementation of the PBL strategy. They would judge the proposed strategy based on what they would have gathered during their participation in the study.

The planning phase of the co-ordinating team, therefore, focused on building adequate theoretical knowledge of PBL in the team. This included educating the team on the noted advantages and disadvantages of the PBL strategy as discussed by Rossi *et al.* (2004:50). The researcher also made efforts in prompting discussion on the possible approaches that could be of use in understanding and adapting PBL, based on the history and theory of graphic design's context, as well as what this would achieve (Rissi *et al.*, 2004:100). Additionally, this phase also prepared the team for PAR, explaining to them how it worked and why it was necessary to take such an approach.

The researcher also used the early phase of the co-ordinating team development process to pilot test that PAR process, as well as the qualitative data collection and means of analysis that were to be used in the final study. The researcher tested for focus group participation capacity during the first preliminary meetings of the co-ordinating team. The researcher steered debate and discussion concerning the effects of the traditional teaching pedagogy on students' ability to professionally fit in, in the workforce. The researcher wanted to test the level of interest and debate that this would result in. Interest in teaching and learning delivery methods, and how these affected students, was considered an important quality for team members because, after all, that is what the study was about and that is what the team members would be committing to do. The researcher noticed that the levels of debate from the test focus group meetings revealed that, indeed, the participants of the co-ordinating team were capable of providing meaningful information on PBL at tertiary level learning. In literature, Strydom & Delport (2002:337) recommended such processes, as a way of testing the capacity and interests of focus group members.

3.4 IMPLEMENTATION PLAN PROGRAMME

As the overarching aim of this study was to eventually implement a PBL strategy within the Visual and Communication Programme in the Faculty of Arts at Tshwane University of Technology, it was important to have an implementation plan programme that was derived from the PAR process. The PAR process, therefore, challenged the researcher not only to provide study findings and recommendations to the study but to come up with a possible implementation framework that the department could adopt.

The implementation plan was, therefore, to be an acceptable outcome of the research process. The co-ordinating team members and the participants needed to accept PBL as a more positive learning strategy than traditional pedagogy, that should be implemented in the department.

Other implementation processes included various operational and strategic issues that are part of tertiary learning, i.e. the development of PBL curricula. To recap the factors

discussed by Barret (2005), some of the implementation issues that were to be addressed by the study were:

- Identification of inside and outside stakeholders in curriculum building at the institution;
- Identification of team expertise in building curriculum;
- Identification of goals, objectives, visions, values and beliefs of the programme in which PBL is to be introduced;
- Reconciling how PBL processes will aid the attainment of the programme's objectives;
- How will the PBL-empowered programme be marketed to stakeholders.

The implementation phase also required the bringing together of all critical factors that determine the success of a PBL strategy.

3.4.1 Evaluating the PBL strategy

After a PBL strategy has been implemented, it was important to assess its impact on the students affected by it. To meet this goal, the research had a PBL evaluation phase. The following questions formed a foundation for this evaluation:

- Were the PBL strategy objectives achieved?
- How do we assess the above?

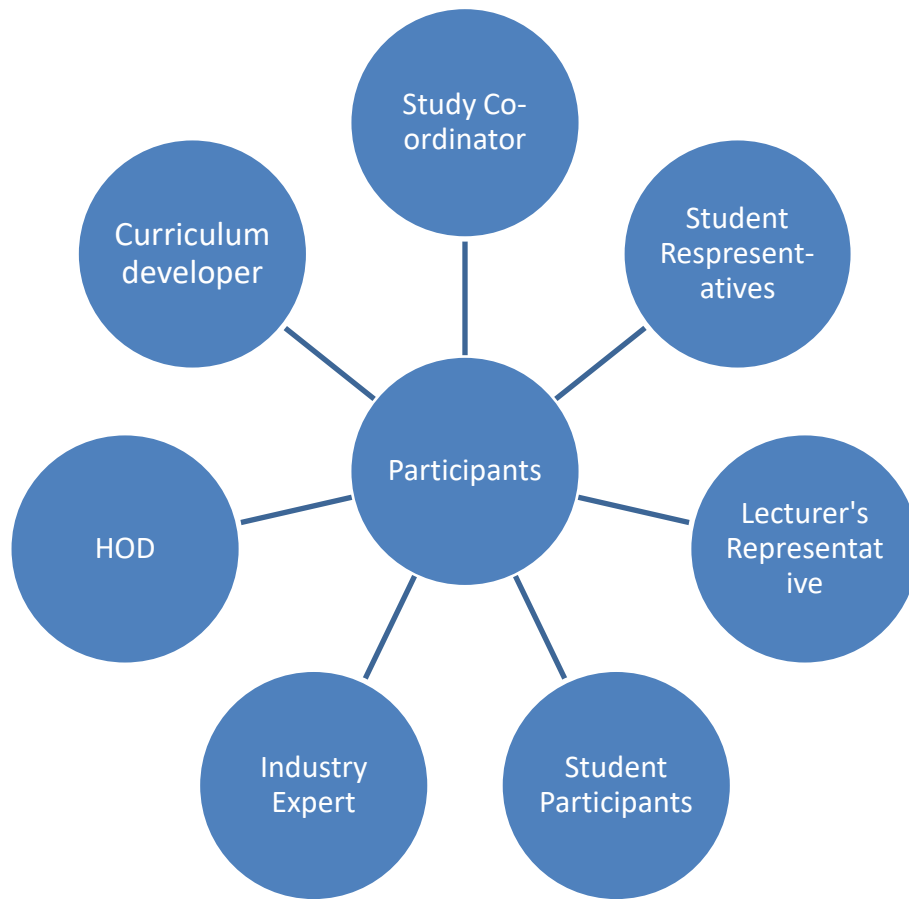
In the views of Frank & Barzilai (2004:49), a post implementation assessment of the effectiveness of the PBL strategy was necessary in determining whether changes were necessary to the implemented strategy or whether the current form was adequate in meeting the set objectives. The post-implementation evaluation process occurred after the study had been concluded and the researcher was decidedly of the view that judging the effectiveness of the new system should be left to the other stakeholders (Terre Blanche & Durrheim, 1999:217).

The researcher noted several PBL strategy effectiveness evaluation challenges. Firstly, the PBL strategic process brought results that were best observable over time. In other words, it might not be possible to report on the effectiveness of the PBL strategy immediately after its inception. For instance, the transformation of the current educational environment to a sustainable learning environment was a factor that could only be evaluated after PBL has been in operation for some time. Additionally, the advantages of the process can take time to develop as the institution slowly adapts to the new way of teaching and learning. With this view, the researcher agrees with Terre Blanche & Durrheim (1999:217) that evaluation of PBL must be left to society and the results must naturally filter in.

3.5 ROLES AND RESPONSIBILITIES OF THE SAMPLE

This section discusses the roles and responsibilities of the co-ordinating team members. It starts by discussing the roles and tasks of the study co-ordinator and researcher, who is also a staff member at the institution where the study is conducted. This is followed by the student's representation of 3rd year diploma in Visual Communication. The next team member to be considered after students is the head of the department, lecturers' representative and the industrial representative.

Figure 17: Study participants



3.5.1 The study co-ordinator

As the study co-ordinator and, subsequently, the co-ordinating team leader, the researcher identified relevant key stakeholders to form co-ordinating team members in line with the suggestions by Sanginga (2010:698-700) and Swantz (2008:34). The process of identification involved thought-provoking discussions concerning the History and Theory of Graphic Design, Contextual Studies, teaching and learning related challenges, as well as problems and possible corrective measures by the stakeholders in the co-ordinating team (Jordan, 2003:188-190). The process culminated in each participant signing the consent form voluntarily to participate in the study (DePalma, 2010:217-219). The co-ordinating team members were invited to an information session, where they were briefed on the study in terms of the theoretical framework, data collection

procedures and techniques, data analysis and ethical issues, and the university requirements and provisions.

As the team leader, the study co-ordinator ensured that the administration and operational issues of the study were attended to. The study co-ordinator also organised material and resource documents for members, in preparation for and as part of the communicative action (Kemmis, 2008:129) and participatory action (Hertz-Lazarowitz, *et al.*, 2010:271; Jordan, 2003:188-189). These included the UFS- approved proposal, ethics documents and the Faculty of Arts approval of the study. In conjunction with the HOD, the study co-ordinator also facilitated the identification and recruitment of other people to take part during co-ordinating team sessions. These included the lecturers' representatives, the industry expert and the student representatives, as well as the class of students that was to participate. The co-ordinator also kept records of the co-ordinating team meetings. With the assistance of the HOD, who is both the senior lecturer and the presenter of the module, the co-ordinator developed and implemented the PBL strategy as a way to enhance a sustainable learning environment, throughout the research process, during the reiterative participatory action process (Sanginga *et al.*, 2010:698) and themes (Jordan, 2003:188-190). *Please see Appendix A1, A2 and A3 for ethics-related documents and permissions.*

The co-ordinator (who is also the researcher) was the first member of the team. He is the head of transformation at the institution in which this study was conducted, and a professional member who participates in different bodies and in different community development initiatives and activities.

The study co-ordinator was a committee in two different community-based forums, namely, Provincial Free State Human Rights Forum (PFSHRF) and Gender Forum (GF), which he also helped to establish. He considers himself as having diverse experience, ranging from transferring of skills (trainer), material and manual development (senior trainer), resolution of conflict and its management at the community level. The study co-ordinator often participated in resolving community disputes through community conflicts management forums, at the local and provincial level. He, therefore, considers himself as

having been sufficiently aware of the situation in the area of this study. As an agent of change, the researcher interacted regularly with the student participants, engaging in different methods of enhancing transformation and creating sustainable learning environments for different types of students, coming from different backgrounds.

The study co-ordinator also served and developed the community through non-governmental organisations (i.e., trainer, conflict resolution and mediator), to a limited extent, however. He was, thus, conscious of the important role these organisations could make to enhancing sustainable learning environments, especially taking into considering the integration of social justice, dignity, respect, hope, and equity-related issues and imperatives.

As the study coordinator and subsequently the coordinating team leader, myself and the HOD identified relevant key stakeholders to form coordinating team members (Sanginga, 2010:698-700; Swantz, 2008:34). The process of identification involved thought provoking discussions on the History and Theory of Graphic Design, and Contextual Studies teaching and learning related challenges and problems. These discussions focused on possible reasons for lacking of sustainable lacking environment (Jordan, 2003:186), and possible corrective measures by the stakeholders in the coordinating team (Jordan, 2003:188-190). The process culminated in each participant signing the consent form voluntarily to participate in the study (DePalma, 2010:217-219). The coordinating team members after signing their consent form where invited to an information sessions where team members were kept abreast about the study in terms of the theoretical framework, data collection procedures and techniques, data analysis as well as the ethical issues and the university requirements and provisions.

Study co-ordinator profile

For purpose of this study, I was the first member of the team and referred to as the study coordinator. I am the head of transformation at the institution in which this study was conducted, and a professional member who participate in different bodies and freely in different community development initiatives and activities.

I was a committee member in two different community based forums namely Provincial Free State Human Rights Forum and Gender Forum which I also helped to establish. I consider myself as having diverse experience, ranging from transferring of skills (trainer), material and manual development (senior trainer), resolution of conflict and its management at the community level. I often participated in resolving community disputes through community conflicts management forums at the local and provincial level. I therefore consider myself as having been sufficiently aware of the situation in the area of this study. As an agent of change I interacted regularly with the student's participants, engaging on different ways of how to enhance transformation and creating sustainable learning environments for different types of students coming from different backgrounds.

I also served and developed the community through nongovernmental organisations (i.e., trainer, conflict resolution and mediator), though to a relatively limited extent. I was thus conscious of the important role these organisations could make to enhancing sustainable learning environment, especially taking into considering the integration of social justice, dignity respect, hope, and equity related issues and imperatives.

3.5.2 Student representatives

The student's representatives were informed and, thereafter, consented their willingness to take part in the research. They encouraged their fellow classmates to take part in the research, as per the verbal request by the HOD. They helped with the delivery of correspondence and communication from the organising team and their classmates. The student-respondents were involved and freely networked together to help with the assignment they were attending to and the research.

The other important roles played by the student's representatives included the following: providing possible answers to the questions asked about the present mode of teaching and learning, as well as the anticipated PBL mode of delivering teaching and learning in their class; working collaboratively in teams and contributing to the enhancement of problem-based learning, as they experienced it.

There was a student-student “power-relations struggle” (Rocha-Schmid, 2010:355) during the students’ study group discussions, caused by, *inter alia*, the subjugation of the voices (Stein & Mankowski, 2004:21; Steinberg & Kincheloe, 2010:143) of the students, who seemed less vocally powerful than their counterparts. The student’s power bases lay in the perceptions they had about themselves in relation to their social interactions with others. These perceptions related to their individual performances in general, regarding the project assignment, that is, the prevalence of the spirit of competition amongst themselves. The students’ individual performance, in turn, tends to be influenced by a number of factors, such as ethnicity, gender, motivation, intellectual aptitude of the learner, personality of the learner, self-confidence, and previous mode of instructional delivery to the students (Akiri & Ugborugbo, 2009:112).

3.5.3 Curriculum developer of the faculty

The third member of the co-ordinating team was the curriculum developer of the faculty and, respectively, the department. This member did not participate in any focus group meetings undertaken by the co-ordinating team, but worked behind the scenes to ensure that the PBL test exercise was implementable.

As a curriculum developer, this member took charge of ensuring provision of consultancy and training to the management and faculty in the scheming, growth and dissemination of curriculum. Her primary responsibility in the study was the designing of the instructional strategies and ensuring that teaching procedures and requirements of the instructional strategies were available and accessible. The course outline that was, therefore, applied in the testing of the PBL exercise, was another of her main contributions.

She supported the sustainable learning environment classroom, as well as the proposed mode of learning and teaching delivery, by participating in the discourse and contributing to preparation of teaching and presentations. She also supervised the conducting of the PBL module curriculum according to the proposed plan and university policy, so that the study did not interrupt its normal activities.

Through her support, the co-ordinating team managed to successfully introduce the study to targeted departments in the faculty. She facilitated informal discussions during departmental meetings and faculty boards, during which she engaged the members of the board, who happen to be lecturers from different departments in the faculty, about the different modes of delivering teaching and learning in assistance to enhance sustainable learning environment (Hammond *et al.*, 2001:8; Tatto, 2006:237).

Finally, the curriculum developer ensured that planning for History of Theory and Contextual Studies took cognisance of the programme of this study project and, as far as practicable, included and aligned to it. The plan incorporated study groups visiting different members of society, malls and other places where students would be able to access individuals that would contribute and add value to the topic and subject at hand.

This further enhanced the engagements of other group members, as well as the integration of various features of PBL strategy. The PBL strategy, as mode of enhancing a sustainable learning environment was implemented, and therefore, was introduced and aligned to the module.

3.5.4 Head of the Department

The fourth member of the committee was the head of the department. The HOD is responsible for the strategy and development of the subject. This member had vast experience in academic matters, supervision, evaluation and supporting departmental staff in promoting teaching and learning experience, research and community engagement. He works with parents and liaises with industrial partners in regard to work-based learning. The HOD also leads the department towards achieving its goals, as well as faculty and overall institutional goals. This made his engagement with the study more strategic as he was also representing the executive dean's office, by extension.

The head of the department as a member was very soft-spoken, almost timid. He had 30 years of experience. He worked regionally and globally, and describes his students as hungry for knowledge. He further describes his role as being more of a facilitator rather

than a traditional lecturer. His classroom or lecture room consisted of many different students, ranging from diverse backgrounds. He displayed a great deal of enthusiasm for his lesson plan, and concern for the extreme variations in his student's needs and backgrounds. As a research professor of the faculty, with experience of 30 years in teaching didactics, this member was exposed to different innovative working methods of delivering programmes, having worked at local and international universities and research institutions. He was, thus, well-versed in educational issues, as well as the nature of PAR, and offered his expertise and knowledge to the study.

In addition to his academic contribution, his co-ordination efforts in the study with the extension of the executive dean's office was strategic and enhanced communication) between the study and official leadership of the faculty. Such a co-ordinator role has been discussed as critical by Liasidou (2008:486-487). In this way, he unblocked potential challenges that were resident in the implementation and related practices, namely, policy, ideological beliefs and differences between the study and the faculty.

3.5.5 Lecturer

The fifth member of the team was the lecturer, whose responsibility was to prepare, execute and grow superior learning prospects for students to assist them in attaining their learning objectives, in line with the institution's ethics, mission and values. The lecturer was also responsible for administering examinations and evaluations. As an experienced lecturer with a postgraduate qualification in arts and design studies, he had expert knowledge of the matter and the skill to prepare and execute lectures, practical and sessions, using creative approaches of teaching.

The lecturer was exposed to both the academic and the professional environments and was, therefore, in a strategic position to understand how teaching and learning systems that graduates were exposed to, affect their competence in the post-academic world. His knowledge of the latest issues was pertinent to the changes of the curriculum of arts and design, and was very hands-on when evaluating student performances in the study.

3.3.3.6 Industry representative

The sixth member of the team was the business community/industrial representative of the department. This member liaised directly with the various economic sectors that graduates and interns found themselves in, during and after the course of their learning. The representative bridged the gap between academic theory and industrial practice. He was able to identify and explain aptitudes that the professional world expected to see in students from the department. Additionally, he was able to identify gaps between these expectations and reality. Through the industry representative, the theoretical views that the current lecturer-centred teaching mode was not providing the right levels of practical skills and solution-oriented thinking was confirmed. The representative presented a strong view that a mode of teaching and learning that empowered the student with problem solving, practical and team-oriented capacities, was necessary for improving the quality of graduates that the department produced.

3.5.6 Community representative

A seventh member, the community representative, unfortunately was not available for the four-week PBL testing session. Due to time constraints, it was not possible to quickly replace and orient this member with another one.

In summary, the overall co-ordinating team consisted of the following: decision makers, curriculum developers, Faculty staff and the key stakeholders, namely, consumers of the programme, lecturers, students and the employers. The research co-ordinator attempted to create a representative team that took consideration of the views of all the stakeholders.

3.6 DATA METHODOLOGY

A case study approach to participatory action research that involved collecting and analysing data from a single case (Tshwane University of Technology) was used in this study (Creswell, 2003: 14). In social sciences, case interests are characteristically people

and programmes, as was the case in this research. The use of different qualitative procedures emphasised the practical nature of the research (Yin, 2009).

There are many reasons for using the case study approach. Creswell (2000:101) notes that the use of the qualitative approach, in combination with the case study, can create and develop a thorough comprehension of the problem under research (Yin, 2009). Kemmis (2009:90) confirms that there is a value in PAR approaches that can change people's practices, their understanding of their practices, considering patterns of saying, doing and relating, and also new ways of life.

Data was collected through focus group discussions and structured questionnaires some data was collected through observation of classes and activities where PBL was in use at TUT in 2012. The observed data was video recorded and transcribed for future reference. Observation was important in the assessment and evaluation of how facilitators and students acted and interacted within a PBL setup. In the PBL class activities, typical PBL precepts and concepts that are discussed in the literature were put into action. These were group work activities in small groups, problem identification, practical research to resolve identified problems, student centred learning, lecturer facilitation student-to-student assessments and facilitator assessment. This was to enable the researcher to get a full picture of how PBL operated and how it would affect the stakeholders involved, towards the creation of an SLE.

3.6.1 Participants

The aim of this section is to give information on the background where this research was done and describe the respondents in this research.

The setting of this study was in the third semester of the week for Visual Communication, and where the second lecture on pre-testing, the workshop on pre-testing and visual literacy, were based on PBL. The PBL groups were facilitated and led by nominated student leaders and, in the feedback and bigger session, the workshop was facilitated by

the lecturer, who, like other participants, attended a two-day PBL facilitation workshop, where they were briefed on specific issues before they conducted the PBL session.

3.6.2 Students

In qualitative research, the aim is not to “generalise” to a population but to develop an in-depth exploration of a central topic (Creswell, 2008; Yin, 2006). With this in mind, the students were the core participants of the study. They were in their third and final year in the History and Theory of Graphic Design III (HTG310T) and Contextual Studies III (CTX300T) courses, administered by the Faculty of Arts at TUT. The representatives, as well as students, came from different systems of education and different feeder schools surrounding the university. Regardless, they were all accustomed to the lecturer-centred type of pedagogy, where the lecturer stood as the source of knowledge and in which they just had to absorb as instructed.

The 41 undergraduate national diploma students participated in the study. Their ages ranged from 22 to 31. The group was well-balanced in terms of gender, with 20 student participants being black and 21 being white.

The class of 41 students was divided into the groups of 4, consisting between 10 and 11 students. These groups nominated their chairpersons or spokesperson, whose responsibility was to facilitate and lead the discussions. The chairperson or spokesperson was also to lead the presentations during feedback sessions. As per the requirements of the course, before any student can graduate, they have to be placed into an industrial set up. Most of these students were already on a placement through the work-integrated learning or experiential training programme, run by the university. They were, therefore, exposed to what is needed in the market of labour. PBL was expected to enhance their capacity to meet these identified industrial needs, among others.

The impact of the historic disparities on their socio-political, cultural and economic backgrounds, prevailed in their different groupings as they struggled for self-identity and the emancipation of their ideas. Similar features of ‘Dire’ tended to be existent in

Australia's 'Take Heart project' (Hickling-Hudson, 2006:5-7), in Nigeria (Asikhia, 2010:232-233) and Botswana (Gboku & Modise, 2008:317). These gave the students hope that the use of PBL to transform their sustainable learning environment would bear positive results.

3.7 INSTRUMENTATION

Various instruments were used in the data collection processes that were applied in collecting both primary and secondary data, pertaining to the implementation of PBL at TUT. These were literature reviews and analysis of documents, semi-structured interviews, focus groups and observation. They are discussed in detail in the following sub-sections.

3.7.1 Review and analysis of documents

In research, the review of literature is important. It forms part of the approaches to gather data. MacMillan (2000:48) attests to the fact that the reason to review literature is to link past studies/research to the new research being performed and investigated through highlighting how the current study equates to past studies. This is further supported by Creswell (1994:21), who states that the review of literature gives a guideline for launching the significance of the research, in addition to being a yardstick for equating the outcomes with other conclusions.

In this study, the researcher conducted a review of literature prior to submitting the research proposal. The aim of the literature was to gain fundamental context and information about the problem being researched, as discussed by MacMillan (2000:48) and Creswell (1994:21). The review orientated the researcher on critical concepts, such as problem-based learning, sustainable learning environments, participative action research and critical emancipatory research. Subsequent to the study outcomes being examined and deduced, the investigator studied the literature to relate, compare and contrast the outcomes with existing knowledge. For more information regarding the literature review, see Chapter 2.

3.7.2 Semi-structured focus group interviews

The open, unstructured interviews are considered to be an effective way of collecting in phenomenological study as it gives a condition that participant's explanations can be discovered, and questioned (Kvale, 2004). Open and unguided interviews in phenomenological studies are envisioned to be exhaustive and to take the format of a conversation. (Gass and Wimpenny, 2000:1488).

According to Patton (2002), open, unstructured interviews are a process of a natural extension of participant observation that relies on the unplanned development of questions in the conversation between the participant and the researcher. De Vos (1998:300), states that the goal of the unstructured interview schedule is to be involved with the people in their current living environment, and to understand such an environment from a theoretical perspective that is founded on people's behaviours, languages, meanings, attitudes and feelings being studied. In Punch's (1998) view, unstructured interview schedules are a means to comprehend people's complex behaviours, without commanding any pre-planned theorisation that is limited to the area of enquiry.

This method of collecting data encourages and enables the investigator to investigate in greater complexity of sense that can't be obtained by other methods (Punch, 1998). The technique even allows data collection from respondents that cannot or are less likely to complete questionnaires, such as those who cannot read, write or express themselves adequately. In this method, the researcher responds to the questions and directions in which the interviewee takes the interview, and mere emphasis to the dialogue, which is more significant as it arises (Patton, 2002).

Unstructured interviews enabled the researcher to collect data on how to study the way in which participants perceived the current teaching and learning environment at TUT, particularly the lecturer-centred methods, versus the proposed PBL strategy. The interviews also enabled the gathering of data on the participation of students in the mainstream economy and society, as per the expectations of learners developed in a

sustainable learning environment. In addition, unstructured interviews supported the full and unrestricted expression of views, perceptions and beliefs by participants. By taking the form of a conversation, as asserted by Gass and Wimpenny (2000:1488), they facilitated the PAR methodology, as conversations create more equality between parties than a structured interview, where one party takes the role of a superior interviewer and the other as a subordinated respondent. Unstructured interviews were, thus, an important data collection process that also resonated well with the critical emancipatory research paradigm and participative action research.

3.7.3 Focus group discussions

Focused group discussions are exchanges between the investigator and the respondents, in order to collect data (Parahoo, 1997:297). Wheeler & Holloway (2002:110), note that in focussed group discussions, investigators engage respondents with the purpose of eliciting ideas, perceptions, and thoughts about the topic of the study, or about matters related to the issue. Focus group discussions are increasingly gaining momentum as a way of collecting data in the human and social sciences, including in educational research. Various scholars, including Chui (2003), discussed the importance of groups in bringing about social change. This observation has resulted in focus group discussions being considered as important data collection channels for action research. Within a group set-up, participants find it easy to adopt a common and shared vision towards the issues they intend to transform. This ability to commonly share and express views is an important, unique aspect that focus groups have, in comparison to other data collection methods, like interviews and questionnaires.

Focus groups discussions that were held, featured the co-ordinating team that consisted of the following parties:

- Head of Department;
- The Industry Representative;
- Student Representatives;
- Lecturers;

- Researcher/Facilitator.

The focus group also had an effect on the methodology as it concluded that an activity or assignment was necessary in testing the effectiveness of PBL.

In the study, focus groups were of great benefit in supporting the participative action research method as found by (Chui, 2003). Participants were able to air out their contributions to the proposed PBL strategies, modify contributions of others and constructively critique other contributions. They were also able to discuss the possible courses of action in the adoption and implementation of PBL. Additionally, focus groups facilitated a consensus reaching process on various matters that the participants did not fully agree on. Discussions through focus groups enabled the attainment of consensus on:

- The study areas where PBL would be most appropriate;
- The integration of PBL with current learning and teaching practices;
- The implementation processes and phases of PBL.

Please see Appendix A.4 and A.4.1 to A4.4 for focus group registers, agenda and attendances.

3.7.4 Questionnaires

The research also used structured questionnaires as a data collection method. These provide respondents with a set of questions or statements they are supposed to respond to, using predetermined answers or responses. Structured questionnaires were used for evaluation post-test experiences of students because of their various benefits (Saunders *et al.*, 2011:360-361). Firstly, they facilitate the rapid collection of descriptive data – which is the kind of data that the study required from the students at this point. Secondly, semi-structured questionnaires make it possible to evaluate and compare results or responses, using a common standard. This is what the study intended to do – to evaluate the experiences and perceptions of students who had been exposed to PBL, using

quantitative standards, such as calculating a percentage of students who held positive views on identified PBL aspects.

Please see Appendix A.7 for the students' feedback collection questionnaire.

3.7.5 Classroom observations

Participant observation is a type of ethnographic research that helps researchers to study activities and events in their natural settings. Fine (2003) defines ethnographic research as the process of observing a group being studied in its natural setting that enables the exploration of organised routines of behaviour. Participation observation, as a process, enables researchers to learn about the activities of the people under study in their natural settings, observing and participating in those activities (DeWalt & DeWalt, 2002). The goal of research designs that use participation observation as an approach, is to grow an all-inclusive comprehension of the phenomena being researched, that is as impartial and precise as feasible, given the confines of the approach (DeWalt & DeWalt, 2002:92).

The classroom activities that were observed by the facilitator were structured as follows:

Stage One: Students were given an assignment. It was a practical study on how targeted recipients of visual advertising communications reacted to the process. The 41 students were divided into 4 groups and asked to tackle the assignment practically, in line with PBL process requirements, i.e.:

- Relying less on the lecturer for guidance;
- Taking full charge and responsibility of acquiring the solution;
- Relying less on textbooks for directions;
- Seeking possible solutions on how they might get the right answers;
- Working in collaboration with one another.

Stage Two: The students gathered theoretical knowledge on the problem given to them.

Stage Three: The second stage started when the students believed that they had gone through the problem at hand and were ready to strategise on how they will tackle the assignment. The 4 groups resorted to field research as a solution to obtain effective answers to the problem. The groups made plans to carry out surveys at malls and shopping complexes in Pretoria. For this to be possible, they needed to plan on various aspects, especially:

- Data collection procedures;
- Data collection tool;
- Data collection team;
- Data analysis and presentation;
- Group self-assessment;
- Assessment of other groups.

Stage 4: The 4 groups implemented whatever they had planned. They mostly did this through visiting various malls and public places, collecting the data that would be useful in providing solutions to the assignment problem.

Stage 5: At this stage, the groups were back in class again, this time to present their solutions. The solutions, whatever they were, were to be presented via PowerPoint by each group's chairperson or nominated member. The facilitator observed the presentations of each group, taking note of the following:

- The extent to which the solution provided met real-world experiences;
- The level of knowledge that the participants appeared to have gained from the process;
- The comprehensiveness of the process that the students applied;
- The level of enthusiasm and interest exhibited by the students.

Stage 6: Question and answer sessions were conducted, where the rest of the class presented questions to the presenting group. The facilitator, at this stage, was able to

gain a deeper understanding of the type of knowledge and experience that the presenting team had gathered as a result of participating in the exercise.

This method of research permitted the researcher to study the process as it unfolds in the classroom. Evidence is gathered as the events are taking place, not before, nor after. The method also provided more precise and detailed evidence than any other source. It also becomes more powerful when used with other methods of collecting data, such as interviews, as well as revealing underlying information that the researcher may not be aware of from the initial stages of the process (Bryman, 2008). The method enabled the research team to observe the PBL model as it was implemented, without interfering.

Please see Appendix A.5 for Groups/Teams Classroom Activity and A.6 for Presentations.

3.8 DATA ANALYSIS

Data analysis is the conversion of volumes of raw data into orderly and meaningful patterns and outputs (De Vos, 2002:339-340). It involves applying one or many of the developed processes that have been designed to meet the requirements of different types of data and studies (Merriam, 1988:127). Because of the multiple sources of data that were consulted in data gathering, careful planning and structuring of the analysis was a critical requirement in giving meaning to the volumes of data collected (Cresswell, 2003:14-15). The final data analysis processes that were applied, were in consideration of the type of research, its goals and objectives and the unique data and information requirements (Caffarella, 1994:138).

The case study approach that was used, challenged the integration of various types of data analysis, both in the actual analysis process and in the presentation of results (Creswell, 2003:220). Data was mostly qualitative in nature, albeit from various sources, i.e. observations, meetings, focus groups, secondary documents and interviews. All this data needed to be analysed and interpreted from a PAR context, demonstrating how participants of the study responded in relation to various PBL issues.

3.8.1 Analysis of the qualitative data

There were several sources of primary qualitative data in the study. These were data from observations of class activities, questionnaires and data from focus group meetings. All the data collected, including that which was collected from the observation process, was eventually converted into written or textual data as part of data transformation. There were 4 types of qualitative data analysis conducted, and these were:

- Critical Discourse Analysis;
- Thematic content analysis;
- Narrative Analysis;
- Statistical frequencies analysis.

These are further discussed in the following subsections.

3.8.2 Critical Discourse Analysis (CDA)

Discourses are a specific ways of demonstrating and comprehending the world (Taylor, 2001). Wodak & Meyer (2001:20), looks at discourse as “communicative events which include dialogues, documented material, related genres, appearances, typography, plans, pictures and other semiotic or significant facets of multimedia. In a CDA perspective, discourse can only be produced, and thereby comprehended, in the interaction of communal circumstances, performance, performer and communal constructs, given the social context (Wodak & Meyer, 2001:20).

Discourse analysis carefully examines language or scripts being used in order to ascertain trends of written symbolism (Taylor, 2001). Discourse analysis further varies from other types of qualitative studies through its guarantee of a communal constructivist philosophy. Through this general classification, discourse analysis can appeal, commencing from a multidisciplinary group of related approaches or set of expectations that explains what and how society can know about actuality, but also a technique or set of methods for researching a communally-made actuality (Phillips and Hardy, 2002:8).

Gee (2005:10) believes that CDA is a set of structures that assist in designating, deducing, and clarifying the relationship between macro and micro connections. Fraser (1991:98) argues that CDA can help us comprehend how people's communal individualities are shaped and changed during the course of time, can help us comprehend how circumstances of unfairness, communal gatherings are created and dissolved, can highlight how the culture supremacy of principle gatherings is protected and challenged, and can give insight on the future for communal transformation and administrative action. According to Fairclough (1995b:6), discourse analysis has three functions, which are, namely, 'individuality' purpose in creating identities, a 'relational' purpose in creating communal relations and an 'ideational' purpose in creating schemes of information and belief. Phillips and Jørgensen (2002), believe that as you apply this function and carry out CDA, two crucial issues should be considered; firstly, the occasion where the communications occurs and, secondly, the arrangement of discourse.

Fairclough (2003:69) states that CDA is a study approach, which clearly tries to disintegrate the strengthening circle of force through recognising hegemony and additionally analysing the arbitrated documents where it comes from. Instead of giving solutions as most scientific studies try to do, CDA raises important "political and moral questions about our community." Phillips & Jørgensen (2002) further support the above notion, as they define CDA as group of "philosophies and approaches for the scientific study of the relationships and between discourse and communal and cultural growths in the dissimilar communal domain", and as what involves looking at language in its context, the idea being that daily language is organised and that, when people talk, what they say follows particular trends that are set for that particular domain (Wodak & Meyer, 2001).

In summary, CDA combines an internal study of language with external study of context, which takes into consideration how the text is affected by social practices and relations. The term inter-textual is often used, which refers to the need for one text to tread in the light of the allusions to and differences from the content or structure of other text (Cheng, 2009).

While there is a variety of different methods for qualitative data analyses, the study adopted the critical discourse analysis as a methodological tool that can seize the verbal distinctions that are related with individuality as well as the fluctuations in linguistic trends that happen across different circumstances, mainly because the purpose is to analyse text.

3.8.2.1 Principles of Critical Discourse Analysis

Principles of CDA that were used to guide the study are as follows (Fairclough, 2003:69; Phillips & Jørgensen, 2002; and Gee, 2005:10):

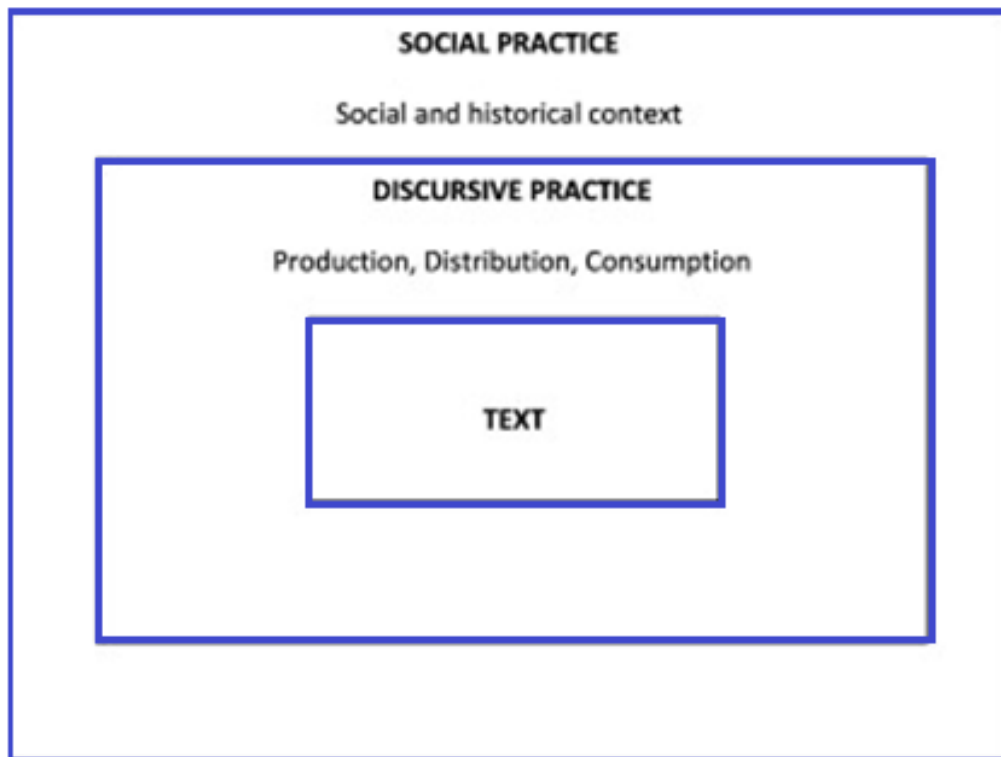
- It is problem-oriented and can analyse necessary communal issues like those of an economic cultural, social and political context;
- To study the communal issues, CDA works at interdisciplinary levels, focusing particularly on the relationships between society and discourse (to encompass communal, political and cultural);
- CDA research focuses on all stages and scopes of discourse, including grammar, style, rhetoric, graphic association, gestures, practical plans and those of interactions;
- Amongst its many goals, CDA is a trial to unveil what is implied relative of discursive endorsed supremacy;
- Researchers applying CDA attempt to express an all-encompassing viewpoint of togetherness with subjugated groups.

The latter is further summarised by Fairclough (2004) as CDA dimensions, namely, text, discursive practices and social structures. These dimensions are further discussed below:

3.8.2.1.1 The analysis

The collected data was analysed using three dimensions of CDA, namely, textual, discursive and social analysis. The relationship between these notions is represented diagrammatically below:

Figure 18: Critical Discourse Analysis Levels



Source: Fairclough (2004)

3.8.2.1.2 Textual Analysis

Textual analysis consists of all discourse, which includes linguistics in terms of terminology, sentence structure, semantics, the vocal systems and adherence of organisations beyond sentences. The script is analysed in regard to how it is said, according to Fairclough (2004:77), script analysis is concerned with the representation, categorisation and, constructions of participants' identity or relations.

This technique of interrogating the discussions of the participants is useful, as it uses what the participants regard as evidence (Fairclough ,2003:60). This means reading and listening to the actual words of what the text says, so that the researcher could have a clear meaning of what gives rise to the production of the text (Phillips and Hardy, 2002:8). The argument, here, is that textual analysis creates room to gain insight into how different

texts, combined with text and context of manufacture and interpretation, can formulate significant discourses.

3.8.2.1.3 Discursive Analysis

Discursive analysis involves analysing terminology, grammar, coherence, togetherness and script organisation of communication (Fairclough, 2005). Furthermore, Fairclough (2003:60) believes that discursive practices straddle the separation between community and ethos on one side, and discourse, language and script on the other side. According to Fairclough (1995:59), this element has two sides, which are discourse processes and institutional process.

The discourse process is characterised by intertextuality, which is important in the making and clarification of discourses and, generally, denotes the propensity of text to relate with other texts. That is, the form, style, content, and tenacity of a script may denote, controvert, or supplement and be prejudiced by, other scripts. A difference can be observed between manifest intertextuality and constitutive intertextuality, which denotes scripts that openly appeal to other scripts, while inter-discourse is defined as the intricate, co-dependent formation of broad creations, which has dominancy over its components and has qualities that are not foreseeable from its components (Fairclough, 1995:16).

The next form of intertextuality is more intricate, and alludes to the interaction of definitions, thoughts, settings, and types that a script may be affected by, without openly alluding to them. As such, the total definition is not resolved by the script itself, but by the amalgamation of other important definitions from external scripts. In practice, the significant insinuation of this idea is that the script should not be construed alone, even though it doesn't obviously mention other scripts. Finally, intertextuality does not view scripts only synchronically, but also historically, as changing the past prevailing agreements (Fairclough, 1995:104).

Largely, the dimension suggests that the discourse in relation to text is made in particular methods and in explicit communal backgrounds, meaning the procedures of manufacture and understanding are communally constraints in two ways. That is by the present

member's means and by the particular form of the communal practices, of which they are components (Fairclough, 1995b:85).

3.8.2.1.4 Social Analysis

Social analysis includes all discourses which involve outside sources which are significant in the process of both production and interpretation of discourse (Jørgensen and Phillips, 2002:61) Van Dijk (2001) further delineates social analysis as communally-united mental representation of communal organisations, relations and groups, together with intellectual processes like clarifications, thoughts and arguments, inference and acquiring knowledge. Fairclough (1995:104), further understands the notion of CDA as a process that involves the relationship between discourse and society that influences and is influenced by the way we perceive the world, as well as social conventions which, in turn, are influenced by and also influence the way in which we conceive the world. Therefore, Fairclough (1995) continues to attest that discourse, as communal practices and as the attention of scrutiny, is involved with discourse relative to ideology and power.

These ideologies are denotations of what is true. This actuality encompasses the real-world surrounding our communal relationships and individualities. The structures take on definitions and types in our broad actions, and also have an impact on the dominant relationships when they are made and changed, over time. This implies that philosophies are entrenched in the scripts that people use, and the philosophies that have become common sense are the most effective ones. However, a struggle continuously goes on, in the discourse practise, to transform and redesign the philosophies that are now displays of dominance (Hellsten, 2002:32).

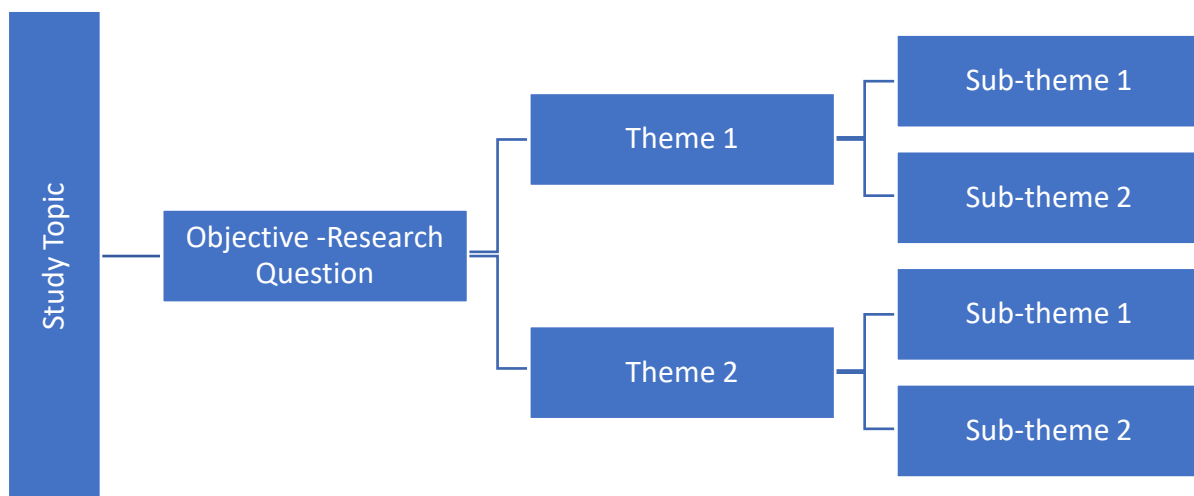
On the other hand, Van Dijk (2000:28) highlights a plan of relationships between the philosophy, community, perception and discourse. Thus, within communal organisations, communal interplay occurs. This takes the form of text, which then is cognised according to the intellect. Wodak & Meyer (2009:7) further emphasise that memory is made of short-term memory, in which planned procedures and clarification occur. Christie (2005a:233) also sees text, linguistics and discourse as basic units of social practices, units larger than sentences and, in text and context, dependence of meanings.

3.8.3 Thematic content analysis

Thematic Content Analysis (TCA) was the major data analysis process that was applied to focused group discussions. TCA involves the reduction of masses of collected data into specific themes through the use of coding practices (Marshall & Rossman, 1999: 54). Elo and Kynga (2007:107) state that TCA can be used in both qualitative and quantitative studies, and for both inductive and deductive purposes. In this particular study, TCA was applied with an inductive and deductive agenda. The inductive agenda came from the need to test various theories and concepts that relate to PBL, SLE, CER and education and transformation. The deductive approach was due to the need to come up with a theoretical framework that could work as part of the PBL implementation process.

Themes that are identified via TCA can be further analysed or broken down into sub-themes. The diagram below exemplifies the structure of this study's themes and sub-themes, in relation to the study's objectives:

Figure 19: Thematic Content Analysis Structure



Source: Researcher

In the study, the themes derived were strongly aligned to the research objectives of the study. Thus a research objective produced a set of themes that, additionally, had their sub-components or sub-themes in the fashion shown above. Sub-themes, in the views of Marshall & Rossman (1999: 54), must retain an element of internal consistency, meaning that subthemes under the same main theme, must relate to the same content or focus. However, main themes do not need to be highly related and must, in fact, be divergent.

Please see Appendix A. for thematic content coding.

3.8.4 Narrative analysis

Narration is generally a story-telling method, where collected data is presented in the form of a sequential, natural story (Bamberg, 2010:3). Narration, therefore, attempts to reveal:

- what happened;
- how it happened;
- where it happened;
- to whom it happened.

Including the parties who were present when the aspects of narration occurred (Bamberg, 2010:3). The author distinguishes between narrative research and research where narration is used as a tool. In this study, narration was applied as a tool to enable the better understanding of the events that occurred during the PBL class activity observations. The PBL group activities, carried out by the five groups that were part of the PBL pilot study, were narrated in terms of what happened and in what sequence, how it happened, to whom, why and when. This was aimed at enabling a better understanding of processes and events that took place at the PBL sessions, as observed by the researcher (Riessman, 2008:54).

The narrations that were provided as part of the process were also useful in further analyses, especially critical discourse analysis and thematic content analysis. Saunders *et al.* (2009:399), citing Fernandez and Starr (2007) state that narrative techniques were effective, firstly, in adding the researcher to effectively describe situations and, secondly,

for effecting the distinct perceptions by reaction. The latter, in this study, also applied video technology to record study activities, which was later narrated.

3.8.5 Statistical descriptive analysis

Statistical analysis was applied to a section of the data collected. After the 4-week test period, 31 out of the 41 students rated their experiences with the PBL processes they had gone through. This data was analysed using frequency analysis and was presented in the form of pie charts. Microsoft Excel was used for this process.

The table below summarises the types of data analysis applied in this research:

Table 3: Data analysis types

Type of Data Analysis	Data Source
Critical Discourse Analysis	<ul style="list-style-type: none"> • Observation of Class PBL activities • Class discussions during PBL sessions
Thematic Content Analysis	<ul style="list-style-type: none"> • Focus group discussions
Narrative Analysis	<ul style="list-style-type: none"> • Observation of Class PBL activities • Class discussions during PBL sessions
Statistical Frequencies	<ul style="list-style-type: none"> • Structured Questionnaires (students' evaluation of PBL)

The above data analysis methods were integrated to provide comprehensive answers to the study's research questions.

3.9 ETHICAL CONSIDERATIONS

Human participation is required in qualitative research when the intent is to yield detailed information, as verbalised by the respondents in their environments in which they derive their capabilities and deduce the meaning of these capabilities (Creswell, 2008). This entails the protection of the individuals as participants who will be sharing their views and facts regarding the topic at hand. The researcher considers the rights of the respondents who provided invaluable knowledge. The researcher further sought authorisation to carry out the research from responsible officials and respected the principles of participants' rights to privacy, confidentiality, integrity, respect and ethical process from the study. These are discussed further below.

3.9.1 Permission to conduct the study

The request for authority to carry out the research was sent to the Faculty of Arts (see appendix 1). The researcher also sought permission from the managers at the Faculty (see appendix 2). Participants in the study also consent to participate after written permission was sought from them (see appendix 3).

3.9.2 Principle of Right to Privacy and Confidentiality

Confidentiality means that any information that the participants share during the study is not made public or available to others who are part of the team. Hungler and Polit (1999:36) note that a promise of privacy and confidentiality to participants is an assurance that information shared during any processes of the study is not and will not be provided to the public, nor made available to anyone except those who participate in the research. Furthermore, the data obtained was utilised in such a way that no one, except the investigator, would know the source.

3.9.3 Principle of Integrity

The principle of integrity suggests that researchers must be honest and consistent in the process of the data-gathering. The researcher strove to carry out the research with integrity. This included honesty in the discussion of results, freedom from personal biases, respecting participants' views and striving for accuracy in results presentation (Kumar, 2011:89).

3.9.4 Principle of Respect and Dignity

According to Allan (2008), respect means respecting the personal rights and freedoms of those who participate in the research. For this perspective, it implies that the participants may not be treated specially nor be discriminated, because the principle automatically protects their rights further, irrespective of their socioeconomic status, disability, nationality, race, gender or other factors.

3.10 SUMMARY

Chapter 3 identified the study paradigm, which guided the study process, as the Critical Emancipatory Research (CER) paradigm. Within this paradigm, Participative Action Research (PAR), which empowers the researcher to be part of a study aimed at empowering participants, was selected. PAR, for the sake of this study, was defined more as a qualitative research approach that, therefore, relied heavily on qualitative data from focus groups and observation. Focus groups and observation were the main data collection methods applied in the study. Focus groups drove the PAR process, as the researcher was able to fully participate in the discussions on PBL. Class observations were included as a method to rest the realities of PBL, in a class environment, at TUT. The study relied on three qualitative data analysis methods, namely, Critical Discourse Analysis (CDA), Thematic Content Analysis and Narrative Analysis. CDA was conducted on the data collected from the class observations, while Thematic Content Analysis was performed on the focus group meetings output. Narrative Analysis was conducted on how each of the five groups, that were part of the PBL activities, interacted up to the point of

producing a final result. The next chapter presents the actual results that were obtained from the data analysis processes, discussed above.

4 CHAPTER 4: FINDINGS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

Various types of data analysis were conducted within the precepts of the Critical Emancipatory Research paradigm. To be precise, Participative Action Research (PAR) required the researcher to be part of the sample, the data collection and the analysis. Qualitative data analysis methods were also applied to some sections of the data, particularly minutes of meetings and focus group interviews. Lastly, some of the data was analysed by quantitative means.

To recap, the study had seven key objectives, as listed below:

- To justify the need for the implementation of PBL;
- To describe the components of the proposed PBL strategy;
- To investigate the conditions that foster the successful implementation of PBL;
- To highlight the challenges and the risks that may affect the successful implementation of this framework;
- To identify PBL student behaviours that are important in an SLE;
- To identify the indicators of a successful PBL strategy;
- To assess the perceptions of the students on PBL activities carried out in the study.

The data analysis process aimed at meeting the above objectives, by using a mixture of PAR, qualitative and quantitative data analysis methods. This data was collected through observation, focus group interviews, questionnaires and through minutes of meetings. Only data on the last objective was analysed using frequency analysis.

The chapter starts by a narrative analysis of the five PBL exercises that were done as part of the test to assess the implementation of PBL, at Tshwane University of Technology (TUT). After that, the results of the data analysis are then presented on an objective-by-

objective basis. The three methods of data analysis that were used, i.e. Thematic Content Analysis, Critical Discourse Analysis and Narrative Analysis, were all integrated to produce the answers to the study's broad research questions.

4.2 NARRATION OF CLASS ACTIVITY

The researcher had the privilege of observing a class of students from the Faculty of Arts at Tshwane University of Technology, and their facilitator, as they went about PBL test lectures. The course in which the PBL sessions were held was the History and Theory of Graphic Design III. Students were supposed to find a solution concerning the degree or extent to which consumers understood visual messages, including hidden ones, in commercial advertisements. The PBL class activity that was observed by the researcher featured 5 groups, each making use of its chairperson to do a presentation of its research questions, methodology and outcomes. The researcher used narration to effectively bring out how the groups acted and reacted, and to tell the PBL test story from TUT more comprehensively. The groups, therefore, appear in the order that they participated in the test.

Please see Appendix A.5 and A.6 for group presentation and detailed case.

4.2.1 Group 1 PBL Exercise

The group's presenter introduced himself and pointed out that the cameras that were used, as part of the observation apparatus, made him nervous. The presenter started by pointing out the adjustments they had made to their methodology, in response to the criticism they had received in the previous session. The presenter also distributed sample questionnaires to the class. The group had structured three research questions to provide a solution to the problem at hand. These were:

- What do viewers think of a visual message?
- Are claims concerning visual messages exaggerated?
- Did the image convince buyers to buy?

The group carried out a survey on campus, where they distributed consent forms and questionnaires to willing students. They came up with the following results:

- The market interpreted visuals with 71% accuracy and 29% inaccuracy;
- Fifty-one percent (51%) of the market thought that the visuals were exaggerated and 49% thought that they were not;
- Sixty-one percent (61%) of the participants were not convinced to buy the products while 39% were convinced to buy them.

The facilitator was not convinced that group 1 was able to answer its first research question - what did viewers think of a visual message?

Other students presented their own critique and comments to their presentation. The facilitator concluded by asking the group to think about what they would improve if they had a chance to do the study again. People who were able to interpret adverts correctly were familiar with either the adverts or the related products.

4.2.2 Group 3 Presentation

The next group to present was group 3. The presenter for the group started by explaining how they were to approach research participants. They were responding to the previous week's questions, regarding how they would go about carrying out this task. They prepared a leaflet that contained the adverts to be rated, as well as other information on the project, i.e. its purposes and consent. The group had a 68% response rate amongst male participants and a 32% response rate amongst females. The presenter commented that the group expected more females to participate because the adverts were female-centric. The group's research questions were:

- What do the visuals on ads claim?
- What do the visuals imply?
- Are the claims exaggerated?

The group's finding was that the market did not have a good understanding of hidden visual messages in adverts. Advertisers should, therefore, focus less on hidden visual messages. Most participants failed to appreciate adverts because they could not relate to them. The group commented that research participants felt that the questionnaire was a bit too long.

On the critique side, the facilitator and fellow students agreed that the group needed to be sure of its statistics and numbers. The group appeared not to be very sure about its sample size. It also appears as if the group had misinterpreted response rates above, i.e. 62% males and 38% females. The group was attempting to state that the sample consisted of 62% males and 32% females. Another student was also concerned that the group was not able to breakdown its results by gender .i.e. like the previous group. The facilitator also advised that students should make use of both figures and percentages when presenting statistics.

4.2.3 Group 4 Presentation

The group stated that it used a sample of 44 persons and collected data in various places of Gauteng, specifically, Danville, Faerie Glen, Menlyn, Benoni, Arcadia, Mamelodi, Brooklyn, Bronkhorstspuit and Sunnyside. Each group member carried out 4 surveys to make up 44 questionnaires. The group had made corrections to each questionnaire, in response to previous comments, that it was too long-winded. The group also removed questions that it felt challenged respondents to acquire background knowledge of the product, or of the advertising background. The group condensed its various previous research questions into one: "Interpret the visuals in the ads in your own opinion". They produced graphs per every advert, which indicated how people had interpreted each advert. In comparison with the four other groups, group 4 gave a more detailed account of their study and were able to co-ordinate their presentation better.

The market did not trust visuals and could also not interpret them correctly, resulting in adverts not reaching their objective under the AIDA theory, as they did not invoke

Awareness, Interest, Desire and Action. They concluded that text was critical in adverts and, without it, most adverts simply did not make sense.

This type of presentation was necessary because of the many ads that students worked with. Each advert required its own description from the audience.

There were also arguments about whether the group had given the sample similar questions, of which the presenters affirmed that they did. The facilitator was of the view that both the question and the answers were both good. However, group 1's members, who had raised the issue that group 4's presentation did not make sense, insisted that group 4 should have applied broader answering categories, where respondents were to choose from. The critiquing student stated:

"To me nothing makes sense now, it confuses me more than ever"

Another white female added that group 4's results became vague as a result of the many categories they had:

"Your results seem vague and we do not know where you are going with this"

Another member of group 1 commented that group 4's methodology might have resulted in them influencing the research participants. At this point, a noisy, confrontational verbal exchange amongst the groups occurred and the facilitator had to intervene. Even when the groups were pacified, members could be heard making critical comments in low voices. The facilitator commented that group 4's methodology was unique but good. He also applauded the way they defended themselves and also the type of critique it got.

4.2.4 Group 5 Presentation

Group 5 said that they developed a questionnaire, and handed each group member five questionnaires. They did their data collection at TUT main campus.

The presenter stated that the group was baffled as to why females could not comprehend the meanings of the adverts, as most of these adverts were female-centric. The presenter stated:

"I could get that, like how come most males understood the ads than females"

A female student, who had been quiet all along, appeared annoyed by this statement and asked,

"In your introduction you said the males and females answered differently...One thing that stood out is something about them answering correctly...my questions is what's the correct way of answering this advert...?"

The presenter replied that they did not have a wrong or right answer, but simply asked the respondents to answer "yes" or "no" to the question of whether they had understood the adverts.

Another member from the group commented on how they had decided to "scrap" some irrelevant questionnaires. The facilitator required a further explanation of this action. A member of Group four commented against the methodology – that is, it did not specify the categories of response. The facilitator then interjected and discussed the issue of validity and reliability as research issues. According to the facilitator, people might misunderstand questions and, therefore, fail to respond to them.

Most people could not understand visual meanings without the text. Ads, in the group's views, should incorporate text if they are to make a meaningful statement to the customer.

Overall, the group's presentation was very short.

4.2.5 Group 2 Presentation

Group 2 presented last. The group used social media, particularly Blackberry Messenger groups (BBM), to seek answers on the research topic. In their method, they used the product advertisements that were under investigation as a BBM profile picture. They

would then ask other BBM group members to comment on what they thought the images were conveying, in terms of advertising information meanings. They would then change the images until all the adverts had been aired. They also used email questionnaires and administered structured questionnaires. However, the group did not discuss how the last two processes were carried out. They recorded the responses from the BBM for presentation.

There were various criticisms to Group two's presentation. Firstly, the class wanted to know why they had not done a normal printout of questionnaires and given these to respondents. Secondly, there was a question of whether respondents in the study could not have been influenced by third parties who were not part of the study. Thirdly, the class wanted to know for how long each advert was displayed online and how this could have influenced the result. There was also a comment that people would not follow through all ten adverts online, as they would get bored – compared to a physical questionnaire, where the data collector is there to urge completion. One class member critiqued that social media images sent through phones are too small for analysis. Another student critiqued that the fact that they used more than one data collection method, meant that some respondents were exposed to the adverts for a longer time, and were able to make better judgements.

Most of the criticisms, unfortunately, were not convincingly answered. The group resorted to responding together inaudibly, hampering effective answering of queries from the floor. A member of group 1 had commented that the method “was not effective” because the pictures were very small. Answers to this question by a member of the presenting group was almost confrontational, stating that it was okay to use small images as long as there was not text to be met. Another member from group 1, a female who was generally critical, gave an example of the “lympho” advert that was too small to make sense of. There were no meaningful responses to these criticisms, except group noise.

The facilitator then closed the arguments by commenting that the use of social media was innovative. However, there could have been weaknesses that the group needed to identify and address.

4.3 DATA ANALYSIS BY OBJECTIVE

In this section, data analysis results are presented on an objective-by-objective basis. It starts with the first objective and ends with the seventh.

Please see Appendices A4.2 and A.8 for transcribed discussions and coded transcriptions of collected data.

4.3.1 Justification of PBL implementation

Objective one of the study was “to justify the need for the implementation of PBL”. Various justifications and merits were identified from the focus group discussions, as well as from the observed PBL group activities. From the Thematic Content Analysis, the identified themes relating to the justification of PBL were derived, and these are discussed below.

The overarching justification of PBL came from the Head of Department, who acknowledged that PBL had many benefits that were very useful to students. This comment came after a lengthy focus group discussion, in which other panel members had talked about both the merits and drawbacks of PBL. The HOD stated that:

“I take that as an order from the committee.... because, look, I can see a lot of benefits for the students, if I do the thing right, as the facilitator/as the lecturer, but I must also guard against the pre-conceived ideas about talking and chalking as it is always easiest option for us. So if you say then I have to prepare something, and submit to the next meeting, at least for critique and comment, I’ll take that as a decision, or as a request or as a suggestion. At least I can take it from there, taking consideration of particularly the comments that you made, I think they are pretty valuable.”

The HOD was, however, cautious about quickly dismissing traditional teaching practices because of its simplicity relative to PBL, and also its wider acceptance and benefits.

4.3.1.1 Bridging the experience gap

PBL was a rational teaching and learning method because it was able to automatically bridge the gap between education and work. With PBL, students left educational institutions, already equipped with practical experience in the professional world of work. This was because the practical nature of PBL exposed students to the expectations, requirements and processes in industry. The industry expert, who was part of the focus group panel, stated that when students got into the professional world, managers and employers expected them to start working and providing feasible solutions right away. Unfortunately, because most students did not have experience in the world of work, they found themselves challenged by this requirement, to the dismay of the employer. If students were developed through PBL, they would not find the transformation from an educational institution to an organisation of professional engagement challenging at all, due to the above-mentioned experience factor.

“You know, I always say to students when they apply, you know what we expect from you, is to come and teach us. You’ve just been taught the latest, you’ve been involved in the latest and we, a company that is dealing with what is going on at the moment, we expect from a student that has just finished his course to come and tell us what we should do. And they think the opposite way, they think I need to come and work for you so that I can get experience. Now if you do it in a problem-based way that is almost as if you are bridging a bit of that problem of experience. Because we have already solved the problem, I can immediately give you a problem to solve.” – Industry Expert

Therefore, PBL-capacitated students are better able to fit directly into industry, without the need for them to spend several years attempting to build critical job experience that would, eventually, enable them to become efficient and effective problem-solvers.

4.3.1.2 Problem solving skills

Students that have passed through a PBL system were mostly likely to become competent problem-solvers. The ability to come up with practical solutions for professional and industrial problems, just like the experience factor mentioned above, were critical expectations for modern day graduates. The lecturer stated that PBL forced students to learn to find solutions and fix problems. These abilities were not short-termed like memorising concepts:

“It’s like everything Wessels, if you force yourself to do a thing, if you are forced to fix this engine yourself, go and fix it, you will learn a hell of a lot, if you do it yourself, you do problem-solving, and you remember...” – Lecturer

In the above citation, the lecturer was emphasizing the point that it is better to develop problem-solving skills than academic theoretical concepts, as these are soon forgotten. The lecturer further strengthened the problem-solving skills point by stating that this particular skill is what the industry was currently looking for:

“Khosana can I tell you last year I spoke to a couple of guys in the industry, theatre directors. From three studios/agencies ... and one of the things that came on top of their heads....what we really wanted is thinking designers, people that can solve problems. Typically, if I’ve given you a campaign, here’s the whole campaign, you must go and see what the clients wants for that campaign; they must not be told what to do, they must think the whole thing out, problem-solving thing is good practice, problem-based is good practice.”- Lecturer

Thus PBL was important in skilling students with problem-solving competences, which were an important requirement in the industry.

4.3.1.3 Abilities to work in teams

The focus group discussed the importance of being able to fit into a teamwork

environment as a very relevant aspect of the professional world. In the professional world, professionals rarely worked as individuals, but usually worked in collaborative teams. PBL is important in developing this teamwork experience and requirement that would benefit students, once they graduate. This was in contrast to the traditional approach, where every student worked alone. In the citation below, the Industry Expert discusses the team concept, particularly how it enabled professionals to immerse their different personalities and abilities in producing a single outcome:

“The one has got certain type of personality, the one has got another type of personality, put the two together, and you’ve got fantastic solutions. Each one on their own, if you say, because you said you have to do it alone, do it all by yourself, each one of those would not succeed alone. But when they are together, on a team, they do it. The guy in South Africa, Mr Frans de Villiers received the most accolades; he’s actually got even medal from the Science and Art Council. He is the first guy ever from the advertising industry to get that. He has never worked alone.” – Industry Expert

The lecturer, in the next citation, described that the process of assigning students to groups, and requesting them to work towards a common goal, was what produced the teamwork components, mentioned above. This is despite the fact that some students might even have resisted working in teams.

“We give the students projects like, at least one project where they get a project as a group,... it’s like groups of three or four, and they have to perform this project together. It is to experience a bit of this working together and solving problems together. Nevertheless, I must say the students do not really like it. They do not like it, because I always get the problem, I see it with Jason today. You get three guys working on a project, and only one or two are pushing or pulling their weight and the rest are just, ehh, you do” – Lecturer

In the class activities that were observed by the researcher, there was strong evidence

of team collaboration. One example is the group 4 presentation, where, through effective teamwork, the group was able to cover a wider portion of Pretoria, as their sampling area thus provided a more representative sample for their problem.

As already highlighted, teamwork is imperative when it comes to group assignments. Participant 8 (P8) indicated that he/she learnt to co-operate and work willingly with others to accomplish the task. While Participant 11 (P11) pointed out that the project helped him/her to perceive the visuals differently:

“The last four weeks, it was imperative and taught me how to work with other – cooperate and participate willingly” – P8

“I think the project offered an insight how people perceive and relate to visuals differently” – P11

According to Participants 14 (P14) and 29 (P29), group integration and interaction was the most significant factor that influenced group productivity. Both participants indicated that the group work assignment was very interesting:

“The past four weeks of this project were great for me because we were required to research and integrate with people.” – P14

“In the last four weeks I would say the activity or assignment was very interesting and I think by doing this it’s much easier because you interact and learn more than when you just sit down.” – P29

The 4-weeks length project was a good experience for students, and some received different responses to their projects. Some found it a good experience to work in groups, since they were able to come up with different ideas together and talk in a group.

4.3.1.4 Covers wide content, provides more knowledge

The implementation of a PBL strategy was also justified by the fact that it improved the students' learning context and content. Firstly, under PBL, students covered wider curriculum content due to the fact that group research and presentations enabled more persons to conduct research on more topics. Under a traditional approach, a lecturer mostly covered a single topic or area of study at a time, because he/she is the only one doing the research and presentation, most of the time. This view was shared by the student who was a member of the focus group.

“Well I guess it’s the variety of the content you are covering. So, say for example you gave us content analysis, for example, and you say we must do research there. And then maybe a certain group focuses on thematic content analysis, and another group focuses on frequencies and then within that whole broad topic, you’ve actually covered segments of different topics, but then within the same thing and then, say maybe by the end of the class, you’ve covered maybe six sub-segments of one big topic that maybe could have taken you something like three weeks to cover in total.” – Student

The Industry Expert agreed with the student, that the group work resulted in multiple sources of knowledge and learning being available to every student. The Industry Expert gave an example of a class that had 6 groups, each of which could have a problem to solve and a lot of information to provide to the class.

“I do here and what must I do here. If you are talking about groups, if you have six groups in the class, and each one of the six groups will come up with other challenge, and that’s what is good because it’s PBL.” – Industry Expert

The views expressed by the Industry Expert were also decidedly evident in the class activities. The 5 groups that were part of the activities each came with a body of knowledge from findings they obtained in different places, using different methodologies. All this knowledge, most of which was quite useful and valid in the researcher's view, was

of great benefit to the whole class.

4.3.1.5 Student remembers and knows more

In addition to providing more information to students, a PBL approach capacitated students to remember more of what they would have learnt, than a traditional approach. Students are also motivated to learn more, and to take charge of the learning process.

“I also agree, I think that it’s going to actually encourage students to want to learn more. Because at the moment I also feel that to a certain extent, we are sort of spoon-fed, with the lot of stuff...at the moment you get to 3rd year, that’s when you actually start realising that, oh no!, we need to start doing work ourselves, and that’s when we start realising that we’ve been spoon-fed all this time” -Student 2

PBL also developed the students’ presentation and communication skills – and these were also very important in the professional world, and in life in general. This view was shared by the Industry Expert:

“But the more we cover we motivate them and encourage them to do certain presentations and so they become more confident, and speaking towards certain people and then by the time they get to the industry they’ve already got that confidence that Mr Wessels was talking about, of being confident in whatever that you are going to present even though it might not be the best idea but the fact that you have the courage to actually speak to somebody about it and try and convince them that it should be the way that it should be done, I think it works.” – Industry Expert

In the group presentations, students communication skills development, particularly public speaking, was noted amongst the presenters, as well as the class.

In addition, other hidden talents from the students can be identified under a PBL process. The facilitator, under such situations, would take the role of a talents developer, helping a student to reach their true potential:

“This is what the art thing is all about, it’s to change talent, and people have got

talents, to mould the talent into the practical approach, to get you to use your talents. And I think if the lecturer becomes the facilitator, that's actually what he facilitates. He must see that this guy is good at that, and he can handle this sort of thing very well.” – Industry Expert

The following citations from various students also showed that PBL had positive learning impacts on both academic topics and disciplines, and practical areas of study:

“In the last four weeks, what we did was very knowledgeable. It was not easy to divide the work amongst us group work, but I surely learn a lot about pre-testing and post-testing. I enjoyed the presentations.” – P9

“According to my own opinion, the pre- and post-testing task taught us values of how to manage large scales of work based on formulating achieved rates of results.” – P13

Some indicated that they learnt statistics and how to solve problems:

“In the past four weeks, I would say I have learned how to calculate statistics and experiencing the ups and downs of working with a large group of people.” – P21

“This was a very interesting approach that was used, it was hands on, active, knowledgeable, it helped us see and learn a different form of learning and this exercise is implementable to solve problems.” – P22

4.3.1.6 Competitive advantages in industry

Due to the fact that students, who passed through a PBL system, were highly skilled in problem-solving, which is a competence that was on demand in the professional world, they stood a better chance of obtaining jobs and rapidly developing their careers. The Industry Expert, Lecturer and Student all acknowledged the high levels of competition in

the professional market of today.

In the views of the Industry Expert, competition was driven by the fact that there were many institutions offering the same programmes to many graduates. With problem-solving skills, however, one stood a better chance of getting a job and also rising through promotions:

“And today, there a lot of guys that is qualifying in your field. So there is a challenge out there, just getting a proper job and getting acknowledgement, and getting the opportunity to solve a problem is a big one already.” – Industry expert

The Lecturer emphasised on this point by stating that PBL develops the right skills needed by industry, thereby making graduates from PBL-centred institutions highly acceptable.

“Because that’s the sort of people that they need out there... ok, look, different people they need lots of different people.... I think the top people are going to be the people that can really think for themselves, and solve problems, and still want to call it problems, I’m used to tell you guys this is all about problem-solving, each thing has got its problems, and design is about problem-solving.” – Lecturer

These findings show that PBL helped the students to secure a career in today’s highly competitive environment.

4.3.2 Components of the proposed PBL strategy

The second objective of the study was, “to describe the components of the proposed PBL strategy”. Various components were identified through the observation and focus group methods applied in data collection, as well as through the literature. Observation, however, provided most data relating to this particular objective.

The first step in meeting this objective was to collect PBL components from the

literature and infuse them into a class activity, where PBL was in use. The second step was to observe if these were feasible and necessary, within the TUT PBL context.

These components were the following:

- Student-centred learning, with lecturer as facilitator;
- Students taking full charge and responsibility of getting the solution;
- Relying less on textbooks for directions;
- Seeking possible solutions on how they might get the right answers;
- Working in collaboration with one another;
- Group-to-group/student-to-student assessments;
- Real-life cases (problems).

This next section presents the results of the analysis of the above.

4.3.2.1 Reliance on the lecturer

In the study, it was noted that students' reliance on the lecturer, under a PBL methodology, was mostly associated with getting guidance on what the lecturer expected. Students wanted to know what the lecturer expected of them when they went in the field to carry out their group assignments. The lecturer's role in the process appeared to be that of a facilitator, who was responsible for clearing up the students' area of confusion. The students took charge of identifying what the lecturer should help them with. From the focus group discussions, the facilitatory role of the lecturer was briefly discussed by the Industry Expert, who stated that the lecturer facilitates students to achieve what needs to be achieved:

"This is what the art thing is all about, it's to change talent, and people have got talents, to mould the talent into the practical approach, to get you to use your talents. And I think if the lecturer becomes the facilitator, that's actually what he facilitates. He must see that this guy is good at that, and he can handle this sort of thing very well". – Industry Expert

The lecturer also took the role of the critique alongside other students. For instance, with Group 2, he wanted to know if the use of numbers, in their opinions, was more appropriate than the use of percentages:

“Do you think, reporting percentages is an accurate reflection of what you have done”. – Lecturer

The lecturer did not necessarily lead the class in the process, but was asking questions as part of the class, along with other students.

The lecturer was also a recipient of information from the students. In one particular instance, the lecturer discussed the issue that parental consent was required in all cases where research respondents were 18 and below, at which point, students were able to provide the correct information, that those who were 18 did not require consent.

The lecturer’s role also became that of a moderator of discussions and debates amongst students. For instance, after group 3’s presentation, a debate ensued on how the group was going to structure its reports, given that it had collected a lot of information across from 9 different adverts. To quell the debate, the lecturer intervened that, once this particular report is completed, group 3 should give it to the student who was concerned about interpretation, so that she can see if she is able to make sense of it. In the above scenario, the lecturer played an important PBL-role that empowered students to moderate and confirm their own work, as students. PBL takes the constructivist effect of knowledge and, in the above example, the student who queried the report structure was not argued or disqualified as wrong but was expected to wait for the output and confirm if it improves their understanding. Thus the lecturer facilitated the knowledge building and knowledge interpretation expectation of constructivism.

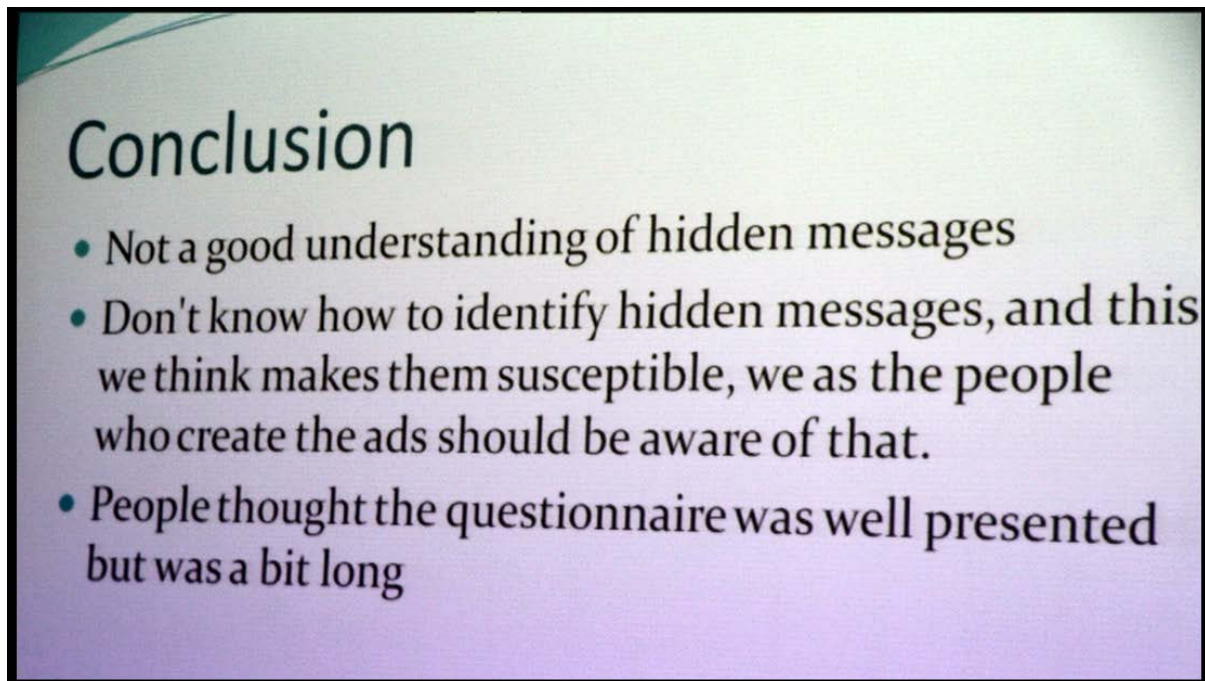
4.3.2.2 Taking full charge and responsibility of getting the solution

In all the five presentations, the students were able to come up with convincing and well-argued answers to the problems that had been given, albeit to different extents. They

were also able to structurally present these solutions logically and were able to defend them against criticisms from other class members.

Group two, for instance, interviewed 38 people and came up with the following answers, shown as a snapshot of their presentations:

Figure 20: A snapshot of group 2's PowerPoint presentation of research results



The chairman of this group made the conclusion that the target audience of visual adverts did not always understand the hidden messages in this advert. They concluded that advertisers should consider making their adverts more literal to ensure that they are more comprehensible to the market.

The above output is evidence that the student's team was able to conduct a study that was enough in answering the presented research questions without necessarily resorting to written material and textbooks.

Groups made mistakes and went along but in some instances, they were able to identify these mistakes without the intervention of the lecturer. For instance, group 3 made

presentation errors by inserting incorrect graphs into their work. They were able to correct themselves. Group 3 were also able to identify and correct some errors on their questionnaires, from observation. They had, initially, included some questions that required a marketing and advertising background, among the research participants. They amended these to leave one opinion-oriented question.

4.3.2.3 Relying less on textbooks for directions

In the presentations by groups one, two, three and five, students did not directly refer to any secondary material or textbooks relying mostly on their primary research findings. Additionally, students also made findings that could easily be found in marketing and advertising textbooks and materials. Students used textbooks as part of their referencing, and not as the full source of their information. Group 3, for instance, discussed the AIDA (Awareness – Interest – Desire – Action) concept, which is popular in marketing and advertising in consolidating their view that the adverts they had presented would not have their intended effect in the real-world, as targeted audiences did not fully comprehend the hidden meanings in them. In the study, however, there was evidence of textbook knowledge being applied to solve problems. This was evident in the statistical analysis processes, where descriptive statistical concepts were applied. Students were able to convert theoretical knowledge from textbooks into practical knowledge in solving the challenges they had.

4.3.2.4 Seeking possible solutions on how they might get the right answers

Each group produced its own methodology of solving the problems presented in the task. The solutions were the final views of the engaged research participants on the impact of hidden messages in visual advertisements. The table below summarises the approaches that each of the groups took.

Table 4: Group observations summary

	Group 1	Group 3	Group 4	Group 2
Presenters	Male, White Presenter	Male, African Presenter	Two Female African Presenters	Male, African Presenter
Research Questions	What viewers think of a visual message?	What do the visuals on ads claim?	How do people interpret visuals in adverts?	Are viewers able to interpret advert visuals correctly?
	Are claims on visual messages exaggerated?	What do the visuals imply?		What visuals do advertising audience believe are good?
	Did the image convince buyers to buy?	Are the claims exaggerated?		
Sample Size	38	50	44	36
Methodology	Ask direct questions on advertising audience views after showing one visual	Ask direct questions on advertising audience views	Showed the audience visuals and asked for their perceptions	Showed the audience visuals and asked for their perceptions
Data Collection	Structured Questionnaire Surveys	Structured Questionnaire Surveys	Structured Questionnaire Surveys	Mixed methods Surveys (social media, direct interactions, email questionnaires)
Findings	The market interpreted visuals from adverts with 71% accuracy and 29% inaccuracy	People miss hidden messages in all types of adverts. Advertisers should exclude such messages	The market did not trust visuals and could not interpret them correctly, resulting in their inefficiencies, Text is critical in the comprehension of ads	People missed hidden message in adverts - they never looked for them in the first place
General comments	Group was able to answer their research questions: Adverts visuals did not fulfil their purpose because of misinterpretation, and exaggeration. The class raised issues of reporting using percentages without numbers as being inappropriate	The group was able to answer its research questions although there were some reporting issues. The class raised issues of reporting using percentages without numbers as being inappropriate	The group was able to come up with a more comprehensive sampling method and methodology, The group's presentation was good despite a few errors. The group had confidence dealing with criticism and questions from the floor	Presentation too short. The group did not convincingly justify its methodology, Its findings were therefore doubted by the class and the lecturer

From the observations above, the researcher was able to conclude that the groups were able to conduct the research processes needed in answering the research questions.

They were able to provide constructive criticism as well as to find errors and weaknesses in their own research procedures.

One of the groups, however (group 5), was not able to produce a convincing output. The group's weaknesses included the subjective selection of which questionnaires to use. The group collected too many questionnaires, and selected those that suited its expectations. In addition, the group required "yes" or "no" responses from candidates, not providing any leeway for intermediate views. Their presentation was also short and lacked coherence – when compared with the other groups.

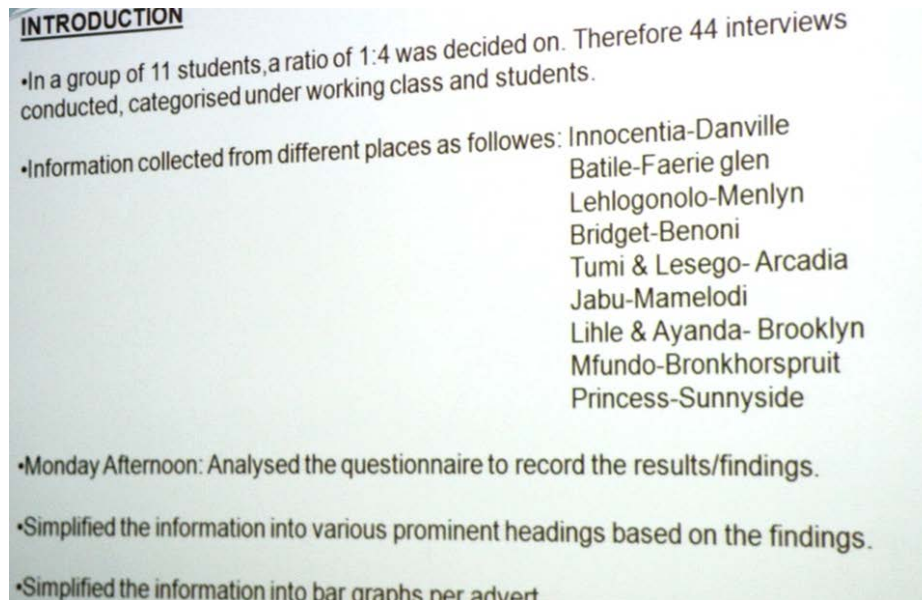
4.3.2.5 Working in collaboration with one another

Group work was identified in the literature as a key component in PBL. In the study, PBL activities were conducted through groups. Group work was also discussed in the focus groups by all the participants, as one of the central pieces of PBL:

“We give the students projects like, at least one project where they get a project as a group,... it's like groups of three or four, and they have to perform this project together. It is to experience a bit of this working together and solving problems together. But I must say the students don't really like it.” – Lecturer

In all the phases of the study, the students showed evidence of group collaboration. In Group 4, the team decided on a dual presentation where the chairperson was assisted with a member of the group to present the group's findings. The group also showed that it was able to fairly distribute the burden of data collection amongst its members and was, therefore, able to cover a wider geographical area of Pretoria.

Figure 21: A snapshot of group 4's presentation on areas covered



The group collected 44 interviews that, in the researcher's perceptions, were adequate in assisting the team to reach its research objectives. Group 2's members took turns in responding to critique and answering questions from the audience. The other groups, namely, group 1 and group 3, also collaborated well in coming up with sizeable samples, albeit group 1 was critiqued for its smaller sample of 38. In the presentation part, group one members collaborated less, leaving all the work to the presenter.

Students also collaborated towards the improvement of their group projects. The leader of group 1 indicated that their group had significantly altered their questionnaire and consent form, in response to the constructive criticism from the group. Two main types of student-to-student collaboration were identified:

- Students working within a group, through participating in different group acts;
- Students working across groups, through constructive criticisms.

The groups and the students, therefore, relied on each other for corrections and amendments to their processes and procedures.

4.3.2.6 Group-to-group/student-to-student assessments

In the class activities, it was observed that students were responsible for the assessment process. After every presentation, the facilitator opened the floor for comments on how the presenting group had performed. This created an environment where students, in the groups, became performance-assessors of one another. Students were able to assess each other on the following aspects of the study:

- The data collection process followed;
- The method that was used in analysing it;
- The presentation of the report;
- The explanations and conclusions made on results.

It was noted, however, that student and group assessment generally focused on what the presenting group would have done wrong and not right. It was, therefore, a form of negative assessment criteria that was meant to inform the presenters on where they would have gone wrong.

Groups evaluated themselves outside the learning sessions, and came up with different assessments. Group one indicated that they made changes in the way they selected their sample and its sizing because of previous criticisms from other groups. This indicates that students were actually willing to incorporate assessment feedback from their peers.

In addition, the facilitator also enabled self-assessment of groups. Each group was requested to assess its own performance. The facilitator used statements like,

“If you were to do this again, what would you change or what would you do differently”

In the self-assessment processes, group 3 stated that they had to change their previous sample participants and simplify their questions after they re-assessed that the previous attempts to use the same had resulted in confusing participants.

Thus PBL supported various forms of assessment, namely, the group-to-group assessment, the group self-assessment and the facilitator-supported or initiated assessments.

4.3.2.7 Real-life cases (problems)

An important component of PBL that is acknowledged in the literature, and that was applied in the study, was the use of cases or problems in delivering knowledge. In the class activity, students dealt with a real-life case or problem. Its features and characteristics were:

- Real visual advertisements that had been used in the visual, print media, and outdoor media, such as billboards;
- Real problems on whether target consumers will be able to decipher the adverts as intended by the advertisers;
- The need to get views of real consumers of the particular products advertised.

Thus, students dealt with a real problem that affected marketing and advertising departments, who spent millions of rands, annually, to try to convey a message to their target markets. Adverts, and the large amounts of money invested in them, only worked if the intended targets got the message in a way that was intended by the advertiser. In the problem observed by the researcher, the students had to bring answers on whether the adverts were indeed understandable to the right customer groups.

4.3.3 Situations that nurture the successful application of PBL

Objective 4 of the study was, "to investigate situations that nurture the successful application of PBL" Both observation and focus group interviews were used in gathering data on this objective.

4.3.3.1 Student involvement

One of the participants in the focus groups, the Lecturer, was of the view that the

participation of students in the crafting of a PBL strategy, was an important success-determinant of PBL in institutions. The lecturer stated that students, who were affected stakeholders, should have an input because, unlike in the past, they currently know as much about teaching and learning and would be able to prescribe PBL conditions that could work.

“In other words, maybe the students should as a class, come up with ideas and tell us how they would like to be taught. Because ‘I suppose they’ve got insight on what’s taking place in the world’. They know a hell of a lot more I think than we think, you know, and maybe they’ve got some good ideas on how they should be taught, and maybe they must be let us know how should this thing work.”

- Lecturer

The view above was generally incorporated into the study. The PAR process included students in both the class activities and the focus groups, from which observations of PBL in action were made. In the class activities, students did most of the talking and controlled the pace of the presentation and the debates around them. Without student involvement and, hence, student participation, it would be a challenge to have fruitful PBL sessions.

4.3.3.2 Industry participation

The Head of Department (HOD) strongly believed that industry should participate in PBL designing processes if PBL was to be effective, as a teaching and learning mode. This is because they are affected by the quality of graduates they will obtain, and they know what is required in a modern professional environment. In fact, the educational institutions did not always know what industry needed, resulting in what the HOD termed an “industry gap”.

“I mean from your side it makes sense, which means after we do something which is going to be motivational for students, we could also have the age gap and we’ve got a bit of an industry gap, and what industry will find useful. So, yes,

maybe from my chair, sitting as an administrative office with comments ...as we work together, but then I need critical comments from the industry as well..."

- HOD

In the views of the HOD, engaging industry as well as the willingness to participate by industry, was an important condition for a successful implementation of PBL.

4.2.3.3 Theoretical understanding and wide knowledge base

Students needed to have a foundational understanding of theory on a wide range of topics for them to be able to effectively solve problems within a PBL environment. In addition, they needed to have access to a wide source of knowledge from which to develop theoretical understandings of challenges they may have been given. As stated by the Lecturer below:

"Talking about general knowledge...students must concentrate on variety of aspects... General knowledge, they must submit a lot...they must know all sorts of things." – Lecturer

Similar views were also expressed by the Industry Expert in the citations below:

"Just to me, from my experience, there's one problem that arises is: what does the student know, what to look for, if he has not been trained to a certain degree to look for certain things. How does he know this is a slim-shape, but without a bit of knowledge, or general knowledge of what design is all about, etc., he does not really know what he is looking at. Do you understand? I think he first needs some basic knowledge to be able to know what to look for. Yes...."

"Look I do not know much about this, but to me that's the problem, it is definitely a problem. You must know what to look for before you can comment, especially when it comes to design. The students must have some basic knowledge...I don't want to talk too much." – Industry Expert

The expert, in the above statements, was referring to the fact that problems often took many facets that sometimes required multi-disciplinary knowledge, which students must have to solve a problem. The industry Expert, however, stated that with current internet accessibility trends, the knowledge base problems may be easily solved by providing students with adequate access to cyberspace.

“What I wanted to say basically is that there is google. You can know you can get anything by just goggling it. Whether you are a designer or a doctor or whatever you are you know. So it is not as if students don’t have access to all the knowledge that there is, I think that it is not something to be scared of, this problem-based thing.” – Industry Expert

In the class activities, the additional need for supporting theoretical knowledge was observed in the requirement to understand the core concepts of advertising and marketing. Additionally, statistical knowledge was also required for students to be able to analyse and interpret results. As testimony, three of the groups exhibited challenges with statistical descriptions.

4.3.3.4 Effective Group management

The ability to structure an effective group work management process was described as an important condition that was necessary for the creation of a successful PBL strategy. This was not a surprise, considering that PBL mostly occurred within group environments, as stated by the Industry Expert:

“Maybe you see another... you see I also do not want to talk too much. I think one of the problems that we have on the inside is that, in practice, what happens a lot is partnerships of two or three. You don’t do many jobs on your own. A lot of success lies within a situation where you’ve got two designers working together. The one has got certain traits, and the one has got others.” – Industry Expert

Group dynamics, and how they could derail a PBL strategy, are also discussed in detail in the challenges objective, where they are included as one of the major challenges within a PBL environment.

4.3.3.5 Supportive educational system

The panel in the focus group also discussed how the current South African educational system affected PBL implementation, and commented on the critical need of a supportive educational system in the successful implementation of PBL. They shared views that the current lecturer-centred learning systems are what the educational system supports. For PBL to be effective, the educational system needs to change supportively, starting from basic education levels:

“I think a system like this is not something like you can take third years and then say, now from third year we are going to do this. You take first years and say this is like this. This is like an education system, it should actually go back to Pre-school, that is where it needs to start, because by the time I get to first year, and then I would be able to tell you what I prefer and what I do not prefer. I do not think they are in a position to do that...” P 2 – Industry expert.

“That is the dilemma of the education system, it’s actually, it’s as if it must be taken right back, it must be sorted right at the beginning. I do not know if this makes sense or not.” P 3 – Lecturer

“That’s what am saying, there’s a good percentage of students that are going to struggle a lot...But again, I understand what you are saying...” – P 3: Lecturer

Thus, there was a consensus that the educational system as a whole needed to be amended towards a PBL-oriented system. Students across the board will then be

exposed to PBL in their early ages, so that, when they encounter it at university, it will not be a new and unusual phenomenon to them.

4.3.3.6 Adequate Implementation timeframes

In the focus group discussion, the implementation timeframe subtheme also came out. The HOD discussed the challenges he must go through in attempting to implement PBL practices to the current third-year group, so that the group can, at least, benefit from such a process before it was done away with:

“Let me come in here, that is where I sitsorry because, ehh, the facilitator, but the next quarter must get their students, and make them industry-ready, in terms of the one little module that is pre- and post- testing. Now, I exaggerated a bit, but my easier term last year wasn’t really like that, it was talk and chalk. When I stand in front and tell what you read and tell you to write an essay...then they do it for me, then I mark the essay and them their marks...and it’s not really like that...I assume that you must tell me, and I must hear from everybody else the work that must do ...you guys are ready for ... is that right? And you can the check how it’s done, and put in as well that eventually thislet heareach one is happy with you... and then when I report to my head of department, or my divisional head he says: mhh...nice done...students are better prepared than last year. So I assume now that I’ve got to get input from ...because I’ve got three weeks to get myself orientated, because when we get back the next quarter, that’s when I’ve got to implement this particular module,”

P 1 - Head of Department

The HOD, in the above extract, considered the implementation of PBL as a short-term prerogative. Another participant was, however, concerned about immediate implementation. The participant was of the belief that PBL must be implemented gradually, to ensure that any unintended consequences would not be too large to deal with.

“I can just suggest that, one, with this sort of thing, I do not think we must try and solve or you must try and solve the big problem. I think you must rather start with something simple, and test the idea, rather than trying to do something, and make it so complicated that it is almost you are not able to judge whether it is working or not. I think you must do that, very simple, take now a very small step, you can take bigger steps later. But I think you should do something that is very achievable, in a way almost easy, not make it too complicated because I think you can shot yourself in the foot.” P 2 - Industry Expert.

Thus, time-frame and the extent of implementation (i.e. gradual versus complete implementation) were noted as subthemes and issues that required consideration, when implementing a PBL system.

4.3.3.7 Conducive Assessment Practices

Another condition that was described as important in the implementation of PBL strategy was the development of assessment systems that resonated with PBL. Traditional learning systems mainly assessed students through marks, and these marks motivated students to work hard. PBL activities, like the one that was conducted in the study, was not for marks, and this created scenarios where students were not as motivated. This was stated by the Student.

“Because to an extent that if you get a project, and you know it’s not for marks, then you say, let me rather focus on the stuff that I know is going to count, as opposed to stuff that I know is not going to count. Because you feel like it’s a waste of time where you could have put in more effort on stuff that you know you are going to get marks on.” – Student

The student further explained the importance of marks in the successful execution of group work:

“In answering your question: I think another way we can use is like, for example, if

we get assignments that are going to be marked, students usually take an initiative to look at research because the primary motivation is that you want to pass. So, say for example, you get a certain topic that you have to deal with, I think it would be better if maybe like you are saying now that if we work in different groups , maybe get different groups, and assign them different topics within the module, and then get them to research it themselves, and then as an incentive sort of, tell them it's going to be for marks, maybe it would count for three or five %, or then if it's not for marks, then it's not for marks then they are not going to put an effort because it's like, why do I need to do it? If it's actually for marks, then maybe we could do like a kind of presentation within the class, as a form of a lecture. You actually get more, and you actually cover a lot more than you would have, had you just been lecturing and telling them what has to be done. So I think it's another way of how we can use it." – Student

The Industry Expert was, however adamant that traditional marking was not applicable to industry. However, given that students considered it important, perhaps it was worth looking at:

"I think I'd just like to say something about the marks that you mentioned. The fact that you are doing things for marks and in the end you need to really work because of that, that's the outcome you are looking for. In the industry there is no marks, you either get the job or you not get the job. It's a very black and white thing, you pitch for something, you do everything as good as you can and it's the best if you give it, but you still don't get it, you know, you still don't get the job." – Industry Expert

4.3.4 Challenges associated with PBL adoption

Several findings were made regarding the objective to highlight the challenges associated with the adoption of a problem-based learning strategy. These are briefly discussed below.

4.3.4.1 Student presentation and communication abilities

Due to the fact that PBL is student-centred, the challenge was that students were not able to perform presentations that formed one of the main knowledge-transfer platforms in PBL. This, in the views of the lecturer, had the risk of rendering PBL a less effective teaching and learning strategy.

“Yes I think it does, because another thing that, another problem or challenge that we faced with, we find that some of the students are not very comfortable in presenting or putting their ideas. You find that they’ve got very good ideas, but when it comes to presenting them they are not very keen on presenting them.”
- Student.

The student, however, believed that presentation skills are part of the learning process of PBL, and students will eventually develop both the skills and confidence to do these:

“But the more we cover we motivate them and encourage them to do certain presentations and so they become more confident, and speaking towards certain people and then by the time they get to the industry they’ve already got that confidence” – Student

In addition, it was not only the lack of capacity to do presentations that was the problem. The Lecturer cited issues of reluctance, where students were openly unwilling to do presentations:

“They don’t like it, because I always get the problem, I see it with Jason today. You get three guys working on a project, and only one or two are pushing or pulling their weight and the rest are just, ehh, you do.” – Lecturer

4.3.4.2 Failure to cope due to background

One challenge that was anticipated by the Lecturer was that some students, especially those who came from disadvantaged backgrounds, where teaching and learning resources were generally scarce, would fail to cope with PBL. The Lecturer was of the view that PBL was conducive to students who have been exposed to that kind of learning, and to adequate learning resources, such that they had developed strong theoretical backgrounds on studies.

“I can tell you right now, you know, that percentage is probably going to be maybe 50:50, or maybe 60 for the problem-based teaching, and the rest maybe for the guys who would actually would like to know...to say it quite straight, this the poorest students, the students who have not almost been like exposed as much as the lot of the students, they have not been exposed to the sort of things, so they need a lot of help, and I think those students are going to be, to want to be taught in a conventional way, I can tell you right now.” – Lecturer

The lecturer also quantified that at least half of the students in PBL classes could be negatively-affected by PBL, as a result of poorly-resourced educational background issues.

“That’s what am saying, there’s a good percentage of students that are going to struggle a lot...” – Lecturer

Thus, in the views of the Lecturer, upon PBL implementation, there was a risk that overall institutional performance could actually go down, as a result of half the students failing to cope.

4.3.4.3 Embedded learning cultures and resistance to change

Traditional learning had turned into an educational culture that students are exposed to from as early as pre-school stages. The process of introducing a new way of learning will most likely be challenging, as these traditional pedagogy beliefs, which are so deeply

embedded, would stand in the way. This was a view shared by the Industry Expert.

“Is not something to be scared of, but I think that students tend to be taught from, Pre-school, they tend to be taught that this is the teacher, and the teacher teaches. So you are getting people that gets into this point where we are now, that’s being, that’s been trained in a specific way, the way of working and I think you almost need to unlock that as well.” – Industry Expert

The Expert went on to comment that an abrupt introduction of a student, from a traditional-approach institution to a PBL one, could trigger some resistance. Students will view the new process as too much of a paradigm shift from how they have been taught throughout their lives.

“That’s almost like an intermediate stage when you unlock and say listen, because: if you come to me, and I’m a student now, now we have to do this new way of doing I will immediately say no I do not like it. I will disagree with the new way, and I think that you have to bridge that by making sure that you just turn the key first before you get into it because in actual fact, I think it is far easier to do it this way.” – Industry Expert

The Lecturer concurred that the resistance that PBL could face was a result of students being exposed to traditional pedagogy, all their learning lives:

“I think you’ve already answered that, you said educational science tells us that the worst form of learning is talk and chalk, because it’s one way of communication” – Lecturer

4.3.4.4 Pressure on the lecturer

The Lecturer expressed a view that changing the implemented teaching method to PBL could be a bit overwhelming. This was due to the time constraints of the changeover process, as well as having spent enough time already working on and developing

traditional teaching material. The Lecturer, in the citation below, discussed whether students should be consulted instead:

“You know I see a problem here. Am busy with the first-years, I used... method for the last three years...and this thing with problem-basedI was actually going to suggest whether we should not go to the students and ask them” – Lecturer

The Lecturer’s above-mentioned views did not necessarily indicate resistance to PBL change, but rather a concern for the change management process. The Lecturer was generally supportive of a learning and teaching mode that supported the imparting of practical, problem solving skills to students.

In sympathy, the Industry Expert expressed a view that the Lecturer could be overwhelmed, in terms of the levels of knowledge that PBL would demand. In the Industry Expert’s view, because each student would employ a variety of knowledge forms in their learning, the lecturer, as a facilitator would be forced to keep up with this knowledge:

“So now the problem is, I’m thinking of the poor lecturer as well...and then the bridge between the institution and the world out there. You know, I always say to students when they apply, you know what we expect from you, is to come and teach us. You’ve just been taught the latest, you’ve been involved in the latest and we a company that is dealing with what is going at the moment, we expect from a student that has just finished his course to come and tell us what we should do. And they think the opposite way, they think I need to come and work for you so that I can get experience. Now if you do it in a problem-based way that is almost as if you are bridging a bit of that problem of experience. Because we have already solved the problem, I can immediately give you a problem to solve.” – Industry Expert

4.3.4.5 Group-related challenges

Learning in groups, through group assignments, could be positive or negative towards the learning outcomes. In most cases, smaller groups are more productive than larger groups and all group members get to participate. Some of the participants indicated a negative attitude towards group assignments. For instance, participant number three (P3) mentioned that it reminded him/her of primary school days, indicating that the past experiences had ascerbated the participant's view ontowards group projects. Once individuals do not participate, that means that they will not be able to provide their views or answers regarding the project at hand:

"Group work in university reminds me of group work in primary school! I would have work much harder and probably would have learnt more if I did it on my own!" – P3

"However, the downfall of the exercise was working in two groups. My group members slacked a lot" – P14

"Stressful, different, had this been an individual project or a two group per person, more work and accuracy would have been achieved. The results could have been even more astounding." – P15

According to the participants, group work is not the preferred teaching method for students. Some participants mentioned that they were unprepared, and did not enjoy working with the group members.

"It was interesting but most was unprepared personally; I will not use this method, because of unprepared students:" – P2

"It was a long 4 weeks, it was not a method I enjoyed doing but it had to be done." – P24

Some of the participants indicated that they learnt a lot from the group work. Group work allows its group members to teach each other and discuss how they understand the tasks. Learning becomes easier when students teach each other in an informal setting.

The main aim of working in groups is to cultivate a spirit of teamwork and co-operation among group members. Through group work, individuals are able to participate freely and contribute towards the group achievements. The following quote exemplifies this point:

“The last four week were imperative and taught me how to work with others and cooperate and participate willingly.” – P8

Although it was not easy to move individuals into different groups that are productive, from the analysis, it is evident that the participants gained different knowledge skills. The following quote illustrates this point:

“That’s in a way a bit of a forced grouping... if there are challenges out there, and am in the company, and I’m the facilitator there, I see then ok, in this case I think Rene and Elshas are the people that will do this the best, then I will tell them you solve the problem. In addition, am not saying you alone, but you, all must solve the problem. Then they do it. You are also going to have a facilitator in the end, but people will not be able to pinpoint and say ok this person is coming up with certain things that if we put this in combination, it will work.” – Industry Expert

However, some found it challenging to comprehend the importance of working in groups.

4.3.5 PBL in relation to a Sustainable Learning Environment

The study also had an objective to identify PBL student behaviours that are important in a Sustainable Learning Environment. Critical Discourse Analysis (CDA) was discussed in the methodology chapter, as one of the data analysis methods that would be applied in the study. In this study, CDA was applied on the class activity that was conducted as

part of participative data collection. Through CDA, 3 key social factors were identified as PBL social and personality challenges, through the nature and character of discourse amongst the 41 students. These were gender, race and the perceptions of academic superiority. These 3 factors were analysed across 3 dimensions of CDA – textual analysis, discursive analysis and social analysis.

4.3.5.1 The impact or influence of race in group learning

In the class activity, the influence of race on the PBL learning process was noticeable. As a background, one among the five groups, group 1, consisted of white male and female students only. Three groups were made up of black students only and one group was multi-racial. The multi-racial group came as a result of some students failing to be part of the other groups, as these were oversubscribed.

Racial dominance expectations were evident in the arguments and critique that students gave after each presentation. The choice of words in the arguments, particularly by white female, students firstly against a black dominated, group 4 and group 3, when analysed from a textual context, indicated a general negative attitude towards this particular group.

While it is notably expected for students to critique one another after presentations, some of the criticism was however excessively harsh and almost unprofessional. For instance, one white female student stated that,

“Your presentation does not seem to make sense”.

In the student’s view, the presenters had collected data and had obtained “too many response categories”.

When critiqued and corrected regarding statistical calculation errors, by a group 4 member, group 1 responded as follows:

“For our statistics we did it this way”

This simple statement denotes the attitude and view of superiority that should not be questioned. Despite the incorrect nature of the statistical method, the presenter would not accept a logical correction from a black, female member of group three. In these two exemplary situations, the expression of text displays negative attitudes in the responders, emanating from the views that they believe theirs is the best approach, regardless.

There is a notable attempt at racial domination through the implication that the previous black presenters' output, despite being able to answer research questions that were raised did not make sense at all. The group that was criticised was able to stand for itself, defending its methodology as effective in bringing out responses to each advert clearly. The lecturer also shared the impression that group 4's presentation was not vague at all, though it had used a different method of presenting data. The lecturer attempted to end the row by asking group 4 presenters to hand over their presentation report, upon completion, to the student who had raised the queries on vagueness.

In the contest between group 1 members and those of group 4, a contest for group superiority was noted. Group 1 members appear to have been challenged by the notable quality of presentation by the group 4 presenters, who were very fluent, organised and to the point. Their response was to attack this group, possibly as a way of asserting their own dominance in the presentation. A group 1 member stated, from nowhere, that they were not trying to tear group 4's presentation apart but were just worried about their methodology. However, the decidedly negative choice of words, like "vagueness", "confusion" and "lack of organisation", disprove that member's claim.

The power struggles between group 1 and group 4, in the researcher's observations, might have been exacerbated by the gender structure of these groups. Group 4 was a black, female dominated group, and group 1 was a white female dominated group. With group 1 being the more vocal and critical, the researcher concluded that it was the group attempting to assert a form of dominance in the class presentations. This dominance, however, was not based on having made a superior presentation (their presentation was not as impressive and detailed as that of group 4). The researcher further concluded that

racial dynamics and racial power relations, indirectly, came into play, despite no group directly using any text that alluded to race or racial bias.

Relating to the use of language as a social practice, the discourses among the groups, however, show a positive aspect- the ability of groups and persons to neutralise attempts at race-related group dominance. Group 4 vehemently refused to be subjugated and to be let down by criticism, whenever they felt that they were right. This aspect of group work in PBL is important, in a sustainable learning environment. As stated in the literature, this is an environment where students are able to contribute positively towards social, economic and political development. Scholars state that the ability to effectively critique policies, and to effectively substantiate the same policies, is an important element in the economic and political development of societies. The political and economic world of today is policy-governed. It takes persons who have the ability to effectively critique those policies, as well as those who are able to effectively and objectively substantiate the necessity of such policies.

4.3.5.2 Gender dominance and effects in PBL groups

In the class activities, issues relating to gender dominance and suppression, as well as attempts to neutralise this, were noted. Starting with the selection of the groups, the first factor that brought people together was race, followed by gender, i.e. students first grouped themselves by race and then by gender. Thus, there were black male-dominated groups, white female-dominated groups and black female-dominated groups, with one of the groups being closer to a balance, regarding race and gender.

The discourse that highlighted gender effects in the PBL class came out more vividly during the presentations. At least two male presenters commented that females were less able in as far as interpreting adverts was concerned. One presenter, a male from group 5, stated that the following:

"I could get that, like how come most males understood the ads than females"

This statement was made sarcastically. The presenter was looking down on females for supposedly failing to understand adverts, including those that had female-centric products. This statement, from a Dimension 2 (of CDA) perspective, shows that males held a low opinion of their female counterparts, even in class. However, female students do have the capacity to stand up to such stereotypical views. A female member of group 4 questioned the methodology that was relied upon to deduce such a view. She asked,

“In your introduction you said the males and females answered differently...One thing that stood out is something about them answering correctly...my questions is what’s the correct way of answering this adverts...?”

This questioner was unfortunately not met with a convincing response, which led the researcher to conclude that the presenters might have come up with such a view, influenced by common, unsubstantiated belief, rather than by actual field research.

Regarding gender, the researcher observed that there was less debate on poorly-substantiated, gender-related results, than in other aspects of the presentations. Thus, on the text dimension of discourse, there were less defensive voices against hints, and suggestions of male gender-superiority. Despite the existence of several outspoken females in the class, only one seemed to have been concerned about these comments. It appeared as if the need to assert academic dominance through presentations somehow overrode the gender biases that were part of the presentations.

Using the presentations as social practice (Dimension three of CDA), the researcher observed that gender power relations, in favour of males, could be hinted at. In groups 1, 2, 3 and 5, males presented the research findings because they were the chairpersons of such groups. Only in group 4 was there a female presenter. To paraphrase, males orated and discussed issues on behalf of females, and females listened and waited to comment. The view that males speak for society and that males speak because they are heads of organisations, was almost reinforced in the discussions. However, the strong ability to critique, shown by both black and white females, as well as the ability to defend critiqued positions, show that females were in a position to challenge male superiority

perspectives, existent in South African society. Additionally, the presentation by group 4 – a female-dominated group – challenged this perception of male leadership, to some extent. To summarily comment, the PBL exercise, in this sense, highlighted unfavourable gender-related issues in the way males and females took charge and spoke for groups. The reversal of such patterns requires students to regularly interact with each other while they learn.

4.3.5.3 Personality and academic dominance issues

Due to the fact that PBL was student-centred, student personality issues could affect the learning process (Emerald *et al.*, 2013). CDA was able to identify the existence of such personality issues. The PBL exercise that 5 groups were subjected to, displays the class and social power structures associated with academic dominance. Students highlighted the need to academically dominate others – firstly, those in other groups and, secondly, those within one’s own group. Using the textual analysis of discourse, words and phrases like *leaders*, *superior*, *chairperson*, *fluency*, *knowledgeable*, *intelligent*, *higher grade*, indicate the following:

- i. How those students who deemed themselves to be academically superior referred to themselves;
- ii. How those students who were deemed to be academically superior were viewed by their colleagues.

In the selection of presenters for three of the groups: group 2, group 5 and group 4, the researcher was able to catch the statements:

“I am going to present because I know this course better than the rest of the group. Let’s use our assignment marks to select who would lead the group”

“XXX should present because she is the most fluent, fastest thinking and cleverest”

“We must not make the mistake of letting someone who is dumb’ present for us, we would be embarrassed.”

“XXX and XXY should prepare the presentation because they did not help much elsewhere. That’s the easiest task”

The discourse highlighted above indicated that student dominance over one another was a common aspect, and an implementation issue that required attention under PBL. Students who felt academically superior ended up imposing their will upon the group and, in some cases, resistance to this imposition resulted in group disharmony and dysfunction. A member of one of the groups was heard saying,

“ I’m better off working alone than co-operating with such ignorant and pompous people...”

Over the 4-week period, however, students in groups that had previous arguments concerning leadership and superiority issues, particularly group 4, were, however, able to work together to present their work and defend it against other groups’ severe comments and criticisms.

The change in dominance attitudes, as expressed in the discussions and exchanges students heard, indicated that the tested PBL approach, somehow capacitated students, firstly, to identify group dominance, to negotiate or fight it and, finally, to find ways to circumvent it. This change in dominance attitudes is shown in the textual exchanges among the groups, particularly in the emphasis on the phrases, *teamwork*, *group work* and *one solution*, in comparison to individualistic words that were common in the first week of the PBL activity. From a social analysis standpoint, the researcher concluded that PBL exercises socially-empowered students to interact better within a group environment, despite the various group and personality dynamics at play. Students learn to find harmony among their differences, resulting in improved social interaction and the attainment of group objectives.

4.3.5.4 Positive critique and commentary

In the final and the pre-final group presentations, the researcher concluded that the quality of critique that students gave to each other was overly positive and encouraging. Students were able to identify flaws and mistakes in their colleagues' presentations. Critiqued parties initially stood up for themselves but, upon realising the strengths and meaningfulness of the other parties' arguments, took heed and made perfective changes in line with the received critique. All the groups in the class activity implemented changes in response to positive, constructive criticism. In a policy-governed world, a world where the matters and issues of social and political justice are omnipresent, students with the capacity to effectively analyse and critique policy will bring more value to organisations and to society, as they will be able to drive policy towards effectiveness. Additionally, students with the ability to positively respond to critique will, most likely, be more adaptive in addressing societal critique of policy and advocating change. Thus, this seemingly distant and less important aspect of the class presentations, will have an important bearing on how students will respond to policy issues in their career lives.

4.3.5.5 Presentations and public discussion

Presentations came as an important vehicle through which PBL output is shared and delivered. As with the ability to critique policies, the ability to effectively speak one's or one's group's mind is important in the development of socially-just and people-oriented society. In a quest for social justice, the ability to engage the public in discussions, and the capacity to effectively give presentation to them, are important. Firstly, they enable policymakers to get the views and perceptions of the public that is to be influenced by this policy. Secondly, they empower citizens to express their views concerning social, economic, political and developmental issues, despite the plurality of the aired views. Thus, students who have been capacitated to engage the public through group work and group presentation, will be more contributory in the cited developmental areas.

4.3.5.6 Problem-solving focus

The class activities, carried out by the 5 groups, enabled the participants to come up with solutions to a real-life problem, i.e. understanding how customers interpret hidden visual messages in advertisements. This is despite the fact that not all the presentations were perfect in content and context. What this showed is that students, working within a PBL context, are able to come up with solutions to problems that face real people in the real world. Additionally, students are able to go out into the real world to seek solutions to problems that bedevil various sections of South African society. Going back to SLE, students who have been capacitated to identify problems, to seek practical solutions to problems, and to confidently present and communicate their solutions, have better solutions to identifying historical, developmental and policy issues that affect social justice. Such students offer a better opportunity to resolve national developmental concerns that are a major theme for sustainable learning. They are able to challenge policies and point out their inconsistencies, as well as propose solutions.

4.3.5.7 Societal interaction

In a polarised world and, indeed, nation, the ability to develop strong interactive capacities with fellow citizens and professionals cannot be underrated. The PBL class activities observed by the researcher indicated, without doubt, that a PBL class set-up creates better opportunities of promoting professional interaction among students. The researcher observed the structures of racial and gender interactions among students in and across groups. The PBL process created opportunities for students to learn to neutralise both domination by way of gender and by way of race. Another form of domination –by supposedly strong academic acumen – was also notably resisted in the presentation. As students progressed towards the final week presentation, the levels of interaction appeared to have become more neutral than in the first.

In the SLE perspective, this kind of interaction, where undue domination is prevented from suppressing views, opinions and facts is a major positive. It enables members of society to interact and discuss problems and developmental issues, as equals. It also teaches one to respect the views of others, and cautions one that perceived superiorities need to be curtailed for the sake of development and social justice.

To conclude this subsection, it is the various, seemingly less important aspects of PBL that, alongside the major PBL goal (learning to solve real-life problems) that will drive society towards social justice. Given that the PBL exercise that was administered at TUT went on for 4 weeks, the researcher is of the view that if students are exposed to PBL for longer periods, they will come out with even stronger abilities and capacities to effectively contribute to the positive change of their economy.

4.3.6 Identification of success indicators

The last objective of the research was, “to identify the indicators of a successful PBL strategy”. The research attempted to collect data on short-term, long-term or immediate indicators.

4.3.6.1 Process success factors and outcome success factors

In the data analysis, two major types of PBL success implementation indicators were identified. These were process success factors and outcome success factors. From the researcher’s definition, in line with this study, process success factors relate to the successful implementation of PBL processes, i.e. how PBL is conducted. This type of success is associated with meeting the conditions that are required for successful implementation. In this study, such conditions were discussed under the fourth objective of the study: “To investigate the conditions that foster the successful implementation of problem-based learning”. Meeting these conditions will arguably guarantee process success. These conditions identified under objective 4 are:

- Student involvement;
- Industry participation;
- Theoretical understanding and wide knowledge base;
- Effective group management;
- Supportive educational system;
- Adequate Implementation timeframes;
- Teaching resources;
- Conducive assessment practices.

Except for student involvement, these factors will not be discussed or explained again, as this was conducted in a previous section of this thesis. In the study, both the class activities that were observed by the researcher and the outcomes from the focus group discussion pointed out that the PBL exercises carried out at TUT were, to a greater extent, a success. In addition to that are the following facts:

- All the groups in the study were able to co-operate and work together;
- All groups were able to make at least a respectable presentation and give a solution;
- All groups were able to assess each other.

The students themselves stated that they enjoyed the PBL exercises, and viewed them as a positive change. These views are captured below:

“Honestly, I did learn from what we do as a group work. I was able to participate and after all, I understand.” - P30

“Very informative, wish we had more group work, it makes understanding a little easier” - P33

“The last four weeks were challenging, especially having to work in groups, availability of group members always closed which affected the group as a unit none the less it was worth the experience.” - P28

Participants 28, 30 and 33 all commented positively on PBL. This, in the views of the researcher and supported by various sources from the literature, is an indication of a successful PBL test-run, which mimics the success of an actual implementation.

4.3.6.2 Outcome success indicators

Outcome success indicators, as defined in this study, relate to the final outputs that students going through a PBL process will produce. These include skills and capacities the PBL will develop in the students, and these are what they will take into the real-world. These are discussed under this subsection.

Several indicators were identified and these are briefly discussed. The Industry Expert's view of success indicators was a cautious one. He stated that it is best to start implementing PBL on a small scale, so that small successes are identified as reinforcements of PBL workability.

"You have to start somewhere and hopefully if we prove that in a small way it works, it can, and the more it gets extended, the better it would be." - Industry Expert

The expert contended that, while the current learning environment presented big challenges, these cannot be immediately and quickly solved through PBL. A progressive and cumulative approach, where simpler problems are solved first, to create knowledge on how to tackle even the larger challenges, was preferable:

"I can just suggest that, one, with this sort of thing, I do not think we must try and solve or you must try and solve the big problem. I think you must rather start with something simple, and test the idea, rather than trying to do something, and make it so complicated that it is almost like you are not able to judge whether it is working or not. I think you must do that, very simple, take now a very small step, you can take bigger steps later. But I think you should do something that is very achievable, in a way almost easy, not make it too complicated because I think you can shoot yourself in the foot." - Industry Expert

The importance of the Industry Expert's views, stated above, is that they provide guidance on the assessment of PBL implementation success indicators. They acknowledge that

success cannot be achieved as soon as PBL is implemented, but rather that there are steps of success and timeframes in which this occurs.

4.3.6.3 Industry acceptability

An important indicator of PBL implementation success was acceptance by industry. This made sense, since industry was the immediate destination of graduates. Any progressive changes in the quality of graduates would soon be recognisable to industry, particularly in the way graduates are contributory or add value to the organisations they join. In the statement below, the Lecturer asserts that, if PBL produced the types of graduates that are noticeable by industry, in terms of their capacity to pragmatically solve problems and implement required change, then PBL can be evaluated to have been successful:

“Khosana can I tell you last year I spoke to a couple of guys in the industry, theatre directors. From three studios/agencies ... and one of the things that came on top of their heads....what we really wanted is thinking designers, people that can solve problems. Typically, if I've given you a campaign, here's the whole campaign, you must go and see what the clients want for that campaign; they must not be told what to do, they must think the whole thing out, problem-solving thing is good practice, problem-based is good practice.” - Lecturer

The involvement of industry as an explicit or implicit evaluator of PBL success is strongly aligned with the view that one of the conditions that fosters the implementation of PBL is an involved and willing industry. The involvement of industry, as a key stakeholder in PBL, was discussed earlier when the HOD stated that the following:

“I mean from your side it makes sense, which means after we do something which is going to be motivational for students, we could also have the age gap and we've got a bit of an industry gap, and what industry will find useful. So, yes, maybe from my chair, sitting as an administrative office with comments ...as we work together, but then I need critical comments from the industry as well...” - HOD

Therefore, as much as industry is involved in making PBL implementable, it should also be involved in assessing its success.

Industry acceptance, as a subtheme of PBL implementation success indicators, is also in resonance with the views that PBL made graduates more competitive in industry. This view, already discussed under the PBL rationale theme, indirectly points at the evaluation role that industry plays in PBL success assessment. For instance, graduates only became competitive in industry if industry has noticed a positive change in them.

4.3.6.4 Competitiveness in the job market

To expand on the subject of job-market competitiveness, discussed above, the lecturer and student further explained that the extent to which TUT become more acceptable to industry, in comparison to graduates from other institutions, was also an important measure of PBL success. Students will become more capable of adding value to organisations:

“I think it’s going to push us to want to learn more, and obviously we are going to be more competitive and more competent in the work place ...so I think it could work.” - Student

“It’s because they are adding value ...it’s a value-adding process. If you go and work somewhere, you must add value. You must be able to solve all sorts of problems/challenges, instead of what Wessels says, just sitting there and just talking.” - Lecturer

This ability to add value and meet industry expectation was due to the ability to meet day-to-day challenges that the industry faced:

“In other words would you be would you be able to meet the challenge? After you leave third or fourth year, you go and work for design studio or agency or whatever, do you think you’ll be up to the challenge? If the guy comes here and say, listen:

here this client wants you to design a campaign; this is a problem or challenge or a campaign; do you think you can do it? Have you got the background to be able to do all the thinking you can do all the thinking work that it takes to design this campaign for example?” - Lecturer

4.3.6.5 Skills and competences development

The skills that the PBL process developed in students was also identified as an indicator of PBL implementation success. Overall, PBL was expected to build certain competences in students. The extent to which these are actually built will indicate PBL success or failure. The student discussed communication and presentation skills as important expectations within a PBL environment. The PBL system must, therefore, work to ensure that these are indeed built into the studentship. The student is quoted saying:

“But the more we cover we motivate them and encourage them to do certain presentations and so they become more confident, and speaking towards certain people and then by the time they get to the industry they’ve already got that confidence that Mr Wessels was talking about, of being confident in whatever that you are going to present even though it might not be the best idea but the fact that you have the courage to actually speak to somebody about it and try and convince them that it should be the way that it should be done, I think it works.” - Student

The above statements pinpoint building personal confidence as a trait, and building presentation and communication capabilities as competences. In the class presentations, it was observed that, indeed, the above were required and were important. Firstly, some students were not participative enough to be useful in the activities and, secondly, some students exhibited poor presentation skills. The extent to which continued PBL sessions will eventually develop these skills and enable students to confidently communicate at all levels is, in the views of the researcher, indispensable.

4.3.6.6 SLE capacities development

In the study, SLE was discussed as an environment where students had the ability to realise their full learning potential and be capable of contributing towards the needs of a

democracy – such needs including social justice, community and nation-building, social transformation, amongst others (Mahlomaholo & Ambrosio, 2013:8). In the study, these capacities also came out as important long-term indicators of successfully-implemented PBL. The SLE matters success indicators of PBL came out through the CDA process that was performed on the data collected through observation.

PBL success could be measured by the extent to which students became capable of transforming their educational output into benefits for a democracy, as postulated by Mahlomaholo and Ambrosio (2013: 8). This entailed the ability to stand up against group and personal domination, as noted in the class presentations; the confidence to speak out and professionally express themselves; and the ability to interact within plurality. As noted, however, the ability of PBL to transform the current educational system into a sustainable one is generally long-term, and is also dependent on exogenous factors, such as changes in the educational system at large

“That is the dilemma of the education system, it’s actually, it’s as if it must be taken right back, it must be sorted right at the beginning. I do not know if this makes sense or not.” - P 3: Lecturer

4.3.7 Student perceptions of PBL participation

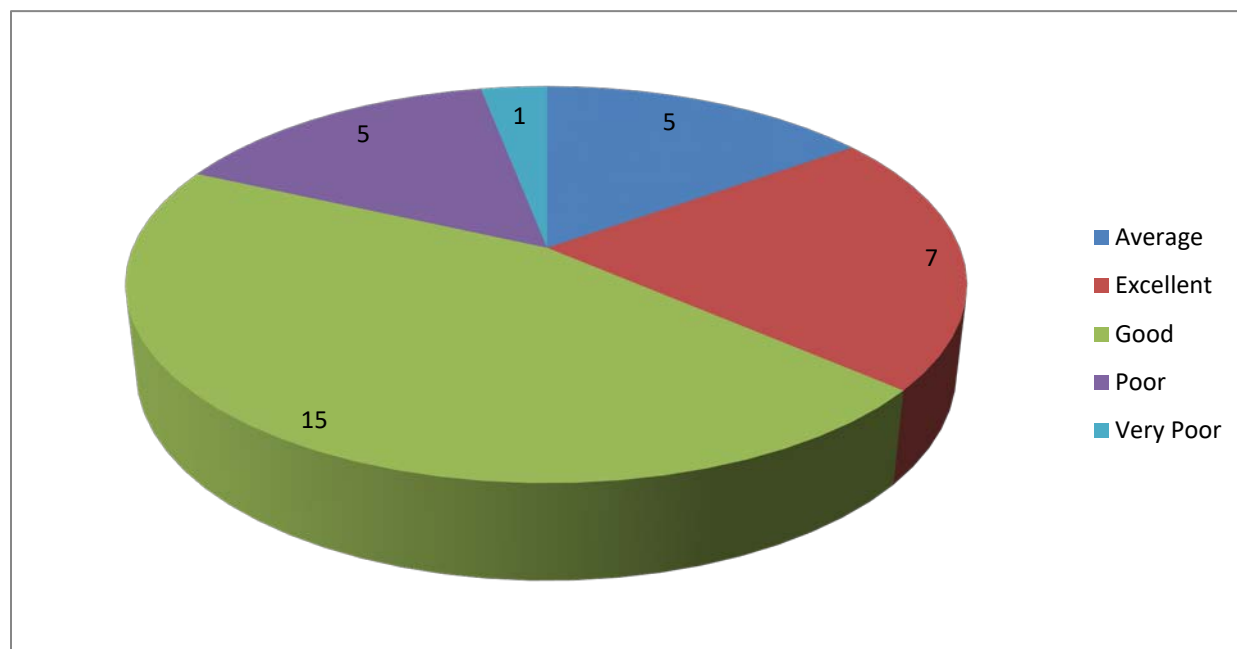
The seventh objective of the study was to assess the perceptions of the students on PBL activities. Students who had participated in the class activities were given questionnaires to fill in, regarding their experiences and views of PBL activities and processes they had gone through.

4.3.7.1 Perception of class activity under PBL

a. Average perception of PBL class activities

In terms of this question, on the level of class activity, at least five participants, namely, participants 5, 8, 15, 20 and 23, felt that class activity was average.

Figure 22: PBL class activity



Their responses accounted for 15% of the total number of responses received from 33 participants. This is slightly different from the responses received from the first question on the degree of student involvement, where 13 students reported “average”. However, in consideration of the responses below, it appears that the difference was inconsequential.

b. Excellent perception on PBL class activity

On this scale, at least seven participants, namely, participants 10, 11, 12, 13, 17, 22 and 34, were of the opinion that class activity was excellent in a PBL setting. Their responses accounted for 21% of the overall responses received from all the participants. It can be argued that responses in the “average” and “excellent” categories fall under a broad category of positive responses, including responses under the “good” category below.

c. Good perception on PBL class activity

Those who felt that class activity was good were 15 in number, namely, participants 3, 4, 6, 9, 14, 16, 18, 19, 21, 22, 25, 28, 31 and 33, representing 45% of all the responses received from 33 participants. As this category also supports the first two categories

above, in terms of their positivity about the level of class activity in PBL, it can be aptly argued that there is a strong indication that class activity was positive, during the PBL sessions.

d. Poor perception on PBL class activity

At least 5 participants felt that class activity was poor during PBL. These were, namely, participants 2, 26, 27, 29 and 30, who accounted for 15% of all the responses received from 33 participants. This serves as an indication that class activity was not completely positive for all the students, during the PBL sessions.

e. Very poor perception on PBL class activity

Adding to the above 5 responses, only participant 24 felt that class activity was very poor, accounting for only 3% of the total responses received.

As the above results indicate, while over 81,2% of all the participants involved in this study felt positively about the level of class activity during PBL, only 18,8% felt that class was negatively affected during PBL. Generally, students were positive about the teaching and learning activity, the group-work, the assessments and the content coverage they experienced during the four weeks of PBL testing.

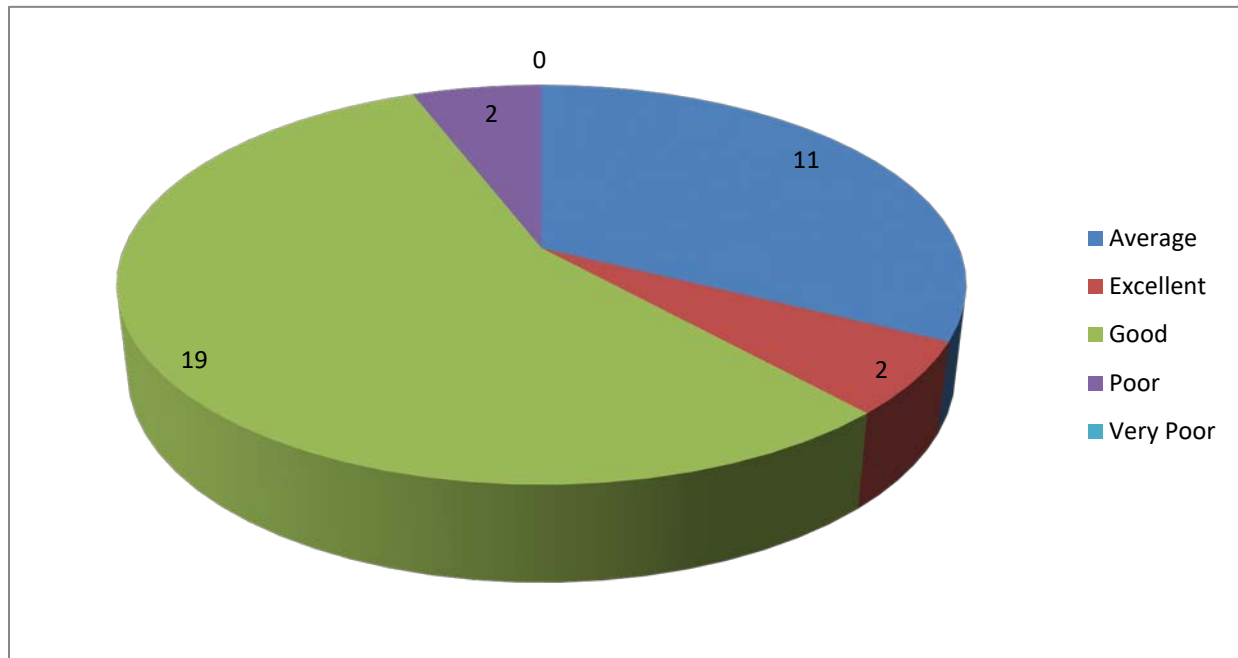
4.3.7.2 Student perceptions of quality of professional knowledge acquired

The importance of the quality of professional knowledge acquired during PBL cannot be overemphasised. If students are found to have received knowledge which they are not able to utilise during professional practice, this is evidence that something is wrong, as the purpose of education would have not been served.

In order for students to be resourceful in their future careers, it is crucial for them to be able to apply what they have learned, practically, such that they would be able to solve problems using that knowledge. If this knowledge can be effectively applied at work, it can be viewed as knowledge of high standard or quality. In this case, students were asked

how they felt about the quality of professional knowledge they received during PBL, and the following pie chart depicts their responses to this question:

Figure 23: Quality of Professional Knowledge Acquired



a. Average

Out of a total of 33 participants, 11 participants, represented by participants 2, 3, 5, 6, 8, 9, 25, 26, 27, 28 and 30, felt that the quality of professional knowledge they acquired during PBL was average. This number accounted for 32% of all the responses received to this question, and served as a good indication that professional knowledge acquisition during PBL was of an acceptable standard to the students. This can be regarded as further evidence that PBL serves students better.

b. Excellent

Two participants, P4 and P16, held that the quality of professional knowledge acquired during PBL was excellent. This represented at least six percent of all the responses received from a total of 33 participants. Although this is not, by itself, a strong indicator of the excellence in quality of professional knowledge gained during PBL, on a positivity scale, this is a significant contributor, by comparison.

c. Good

An astounding number of 19 participants, namely, participants 7, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 22, 23, 25, 29, 31, 32, 33 and 34, agreed that the quality of professional knowledge acquired during PBL was good. This number represented at least 56% of all the responses received, and serves as a strong indicator that most participants felt positively about the quality of professional knowledge received, during PBL.

d. Poor

Only two participants, namely, participants 15 and 24, felt that the quality of professional knowledge received during PBL was of a poor quality. This accounted for just about 6% of all the responses received, and is a weak indication of the poor quality of the knowledge acquired during PBL.

e. Very poor

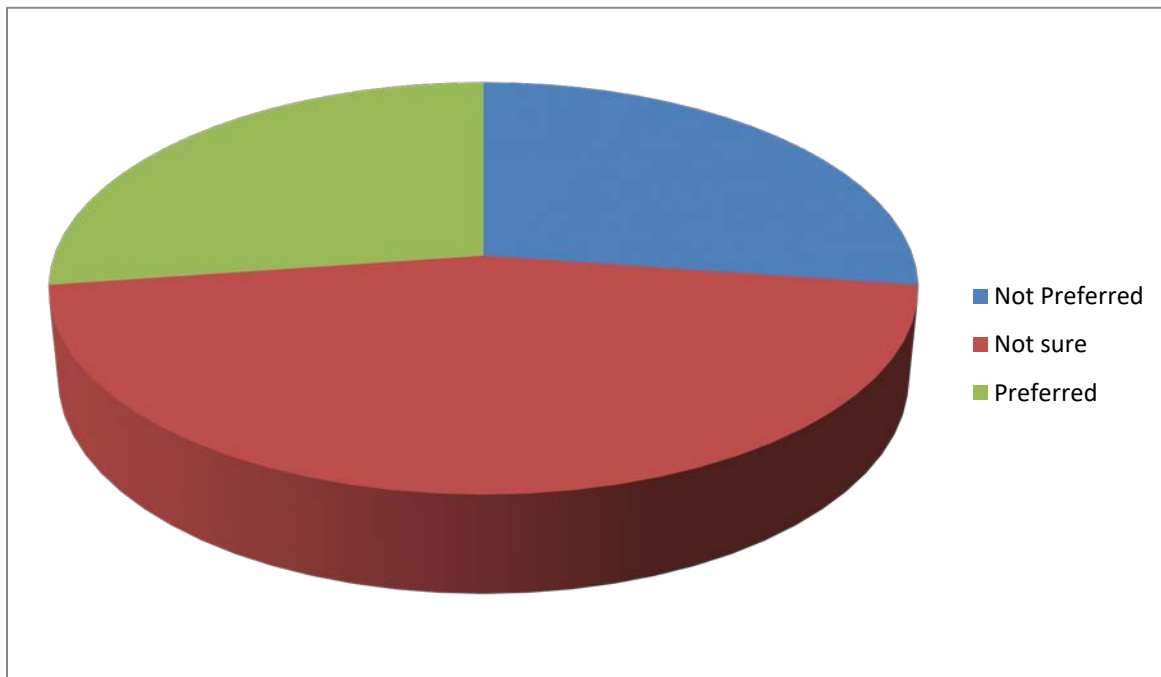
Out of a total of 33 participants, no one felt that the knowledge acquired during PBL was of a very poor quality. The majority of participants indicated that the quality was either average, excellent or good, which shows that the participants feel positively about the quality of the knowledge they acquired during PBL.

From the above results, it can thus be argued that the majority of students, represented by a remarkable 94%, felt positive about the quality of professional knowledge received during PBL. This sentiment is also shared by many authors in the literature reviewed in Chapter 2. This can be attributed to the fact that PBL places more emphasis on hands-on experience of students, dictating for them to be actively involved in their learning. Therefore, the quality of knowledge acquired during PBL is much better than theoretical knowledge, passed on from the lecturer or teacher to the students during the traditional didactic instruction study.

4.3.7.2 Preference of PBL learning

The last question posed to the group of participants concerned their preference of PBL as a mode of learning. The responses received from the participants in this regard are interesting, particularly when one takes into consideration the responses to the previous questions posed to them. It might be appropriate to believe that these responses reflect a level of hesitancy and/or doubt. This is probably because of the novelty of PBL in the institution of higher education, in South Africa. The results below indicate how the participants feel about the acceptability of PBL as a preferable pedagogical method:

Figure 24: Preference of PBL learning



a. Students who did not prefer PBL

Out of a total of 33 participants, at least 9 participants (2, 4, 5, 8, 18, 22, 24, 29 and 30) felt that they did not accept PBL as a preferable pedagogical method. This represented at least 27% of the total number of responses received. Given the positivity of the responses to the previous questions, it is surprising that such a large number of students explicitly declared their reluctance to accept PBL as a preferable pedagogical method.

b. Students who were not sure if they prefer PBL

Out of all the responses received, 15 participants, namely, participants 3, 9, 11, 13, 14, 15, 17, 19, 20, 25, 26, 27, 31, 33 and 34, indicated that they were not sure if they deemed or accepted PBL as a preferable pedagogical method. This number accounted for 45% of all the responses received from the 33 participants that partook in the focus group interviews. It could aptly be argued that, taking into consideration the previous responses on the preceding question topics, the reason why such a high number of participants feel so unsure about whether to accept PBL as a preferable pedagogical method is because of the relative novelty of PBL at TUT. This is probably another indication that a hybrid model would work appropriately, with good results, whereby the ordinary lecture-based pedagogical method used side by side with PBL, depending on the learning outcome.

c. Students who preferred PBL

On the other hand, another nine of the participants, namely, participants 6, 7, 10, 12, 16, 21, 23, 28 and 32, indicated that they accepted PBL as a preferable pedagogical method, representing 27% of all the responses received.

From the above results, it is clear that even if most students feel positively about PBL, they are not sure if they are willing to accept it as a preferable pedagogical method. As indicated above, this can be attributed to the relative novelty of PBL as a method of learning. One can conclude that students are hesitant to accept PBL because it has the likelihood to increase their workload, while alleviating much of the weight from the lecturers or teachers who are expected, during PBL, to only act facilitators.

4.3.8 Findings by way of SWOT analysis

Data collected in the study was also subjected to analysis of strengths, weaknesses, opportunities and threats (SWOT). Below are the results:

4.3.8.1 Strengths

The research process identified important strengths that act as support factors for the implementation of PBL at TUT. To reiterate, strengths represent positive internal factors. The identified positive internal factors are:

- A willingness to explore the benefits of PBL shown by key committee members, i.e. the HOD, the lecturer representative, the participating researcher and the industry expert;
- A positive view by most of the students that PBL is beneficial to their careers and success;
- The existence of academic programmes and courses that can easily be integrated with PBL. In the study, the History and Theory of Graphic Design and Contextual Studies were used as courses of focus;
- Willingness to test the effectiveness of PBL amongst students – shown through participation in the study;
- The institution's ability to liaise and interact with industry and receive expectations concerning the type and quality of graduates required;
- Demonstrated benefits of the PBL process, as shown in the class activities.

4.3.8.2 Weaknesses

Weaknesses that were found to exist in the implementation of PBL at TUT are as follows:

- Possible lack of buy-in by some students – resistance to the process;
- The existence of a strong lecturer-centred culture as a source of resistance to change. Students are too accustomed to this practice, so much so, that some may fail to move with the times;
- Lack of consensus on what should constitute an implementable PBL strategy, including how it will be integrated with current systems;
- The existence of part of the studentship that is not ready for change because of academic background issues;

- Poor or low understanding of the PBL process and its benefits.

4.3.8.3 Opportunities

Opportunities refer to the external environment positives that the institution has on the implementation of PBL. These are as follows:

- The existence of an industry that has demand for graduates with problem-solving capacities;
- Noted weaknesses in the current traditional pedagogy and the existence for opportunities for change;
- A society that is in need of graduates who can act as agents of social change;
- Support and positive recommendations for PBL implementation by the Council of Higher Education (CHE).

A well-implemented PBL strategy will enable the creation of graduates who can add value to society and provide practical solutions to real-life problems.

4.3.8.4 Threats

Identified threats in the PBL implementation process were:

- A part of the educational system that did not fully support PBL;
- Strong embedded culture of traditional learning;
- Socio-economic background may not support PBL capacities in students, especially those from poor economic backgrounds;
- Embedded social divisions regarding race and gender within SA society may affect the interactivity of students, hence the effectiveness of PBL.

To recap, strength and weaknesses refer to factors within TUT, while opportunities and threats are factors within the broader South African environment, of which TUT is part.

4.4 CONCLUSION OF FINDINGS

To conclude, the findings above presented several interesting new and old perspectives on PBL from the main stakeholders of the implementation processes, specifically the students, the lecturers, the faculty and institutional leadership, and also the industry expert. The PAR process enabled the researcher to interact with the above stakeholders, suggest courses of action like the PBL test processes, observe proceedings as part of the group being studied, and also collect data through focus groups and structured questionnaires. Overall, the process collected rich and highly informative, qualitative data, as well as some quantitative data, when rating students' reaction to the PBL sessions they had been exposed too. While PBL won the support of the stakeholders, there were fears and uncertainties which the involved parties expressed, including the acceptability of PBL among some sections of the students, how it would be integrated with current learning, student readiness, lecturer readiness, implementation time frames, as well as curriculum and assessment issues. The findings above also indicated that PBL was capable of bringing about transformation towards a sustainable learning environment, as it supported diverse interactions across the student body and developed communication, problem-solving, analytical and critiquing skills that are positive in contributing towards nation-building.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

PBL is a pedagogical methodology that seeks to develop competent, self-directed, independent-thinking, solution-oriented and pragmatic students, through the use of methods that involve practical problem solving as part of daily learning (King & Boshuizen, 2005:65). In PBL, students analyse multifaceted problems, explore their options and decide on solutions, based on teaching strategies (Simone, 2014:17). It is a direct challenge to the conventional teaching methods that are centred on the instructor, who directs the theoretical learning process, involving minimum student participation. The characteristics of PBL are as follows: It focuses on the student; it is highly practical; it is problem-driven; it is solution-oriented; it is highly interactive and generally more appreciated by the student (De Graaf & Kolmos, 2003:657). Thus, students interact with other students, as well as with the instructor, in an effort to solve daily learning issues that are reflective of real-life situations. As a result, it produces a well-rounded individual, who has the capacity to fully meet the daily challenges of the social, economic, political aspects of life.

At an institutional level, an SLE is a possible outcome of a successfully implemented PBL strategy (Zhou *et al.*, 2013). This is an environment where students are able to contribute, effectively, towards development and social justice, as a result of the optimisation of available learning resources and systems, or are able to “explore and exploit their potentials to the fullest so that they can become contributing members of a democracy” (Mahlomaholo & Ambrosio, 2013: 8). It is, therefore, important to understand the precepts, requirements, challenges and expectations of an effective PBL strategy, so that these can be applied as part of the transformative process to the conventional tertiary learning environment, in South Africa, into an SLE. An SLE’s benefits to South Africa cannot be underestimated, given the current levels of social and economic inequalities and the urgent need for social justice.

To appreciate and answer the research question, enhancing the effective implementation of problem-based learning towards a sustainable learning environment at a higher education institution, the researcher relied on the Critical Emancipatory Research paradigm, where the researcher anticipated the emancipation of students so that they are empowered and capable of contributing more to social justice and development. Through the Participative Action Research (PAR) method, the researcher was able to collect various types of data that were analysed in the previous section. This data was collected from observations, focus group discussions, surveys and documents. This section consolidates all the forms of data into a possible framework for implementing PBL. It discusses the major findings of the study in a triangulated manner. i.e., it reconciles and differentiates findings made from data from different sources and forms of analysis.

5.2 THEORETICAL FRAMEWORK

The study applied SLE, PBL and TDL as theoretical frameworks drawing upon various theories and scholarly discussions. In the literature, it can be noted that SLE, PBL AND TDL are discussed as being actual concepts that have been implemented in the learning environment as well as theories that are still undergoing development. The study took the theoretical and empirical arguments for and against these as its theoretical framework. This guided the determination of research questions that would help to identify processes, systems, stages and frameworks that could assist in the effective implementation of PBL at TUT.

Emancipatory research is a paradigm that is concerned with producing outcomes that are beneficial to disadvantaged persons and groups (Noel, 2016:1). The researcher interacts with the disadvantaged participants without necessarily dominating the relationship with these participants. Ross and Glass (2008:8-12) state that CER challenges inequalities by questioning current realities and placing a strong focus on positive social change. In Oliver's (2002:16) view, CER's significance in research is driven by the failures of contemporary paradigms in addressing concerns relating to disadvantaged groups. These failures include the inability to fully appreciate the perspectives of the

disadvantaged, the inability to provide practical information to policymakers and, finally, the failure to fully appreciate the challenges of disadvantaged social groups.

In this study, the Critical Emancipatory Research (CER) approach was adopted as the study philosophy. The researcher worked together with participants in the sample, in presenting the necessity of framing a plan to produce viable schooling for a specific higher institution. The social cause in need of emancipation is the creation of an SLE, defined earlier as the one in which the principles of social justice and equality are fostered. A successful implementation of the PBL, would result in the emancipation of the majority of South Africa's population who exist in deprivation, as a result of social and economic inequalities that can, mostly, be traced to the Apartheid system.

5.2.1 PBL Implementation

PBL is labelled a concept, a model, a theory, a strategy, a process, an approach (Kemp. 2011), among others. Regardless of how it is defined, it eventually needs to be implemented into the academic environment of interest. The implementation process is defined as the act of putting a formulated activity into action. Implementation, therefore, refers to a transformation from what has been said and written about PBL into an actual process where PBL rules, principles and precepts are followed in teaching and learning.

In strategic planning, there is wide discussion pertaining to the difficulties that organisations and institutions face when they finally decide to implement whatever strategy, process, event or activity they have been formulating. General implementation issues have been formatted into various models and theories that attempt to guide implementers. In PBL, implementation issues and modalities that form a common part of intellectual and professional discussion, include the following:

PBL is a learner-centred strategy that guides students towards learning aspects in all domains, i.e. cognitive, psychomotor, social, community, professional, affective behavioural and/or ethical aspects (Barrows & Tamblyn, 2000:100). Kemp (2011:45) describes it as an approach emanating directly from the precepts of constructivism.

While constructivism is a theory, PBL is what turns this theory into practice (Kemp, 2011:45). It is regarded as a useful learning strategy, that enables students to be self-directed and competently solve problems through-out their lives. PBL leads and facilitates students towards self –directness within a specific context or speciality, based on the belief that all individuals are capable of learning (King & Boshuizen; 2005:65).

In this study, PBL means the staging of a challenge, after which students undertake to explore the key issues in their small groups, clarify facts through brainstorming and formulate hypotheses. In their break-away sessions, students locate and use available resources to gain information pertaining to the problem. The students return to their groups and become involved in a participative effort in trying to solve the real-world problems constructively. They review the importance of their findings, whether the new information supports, negates and/or changes the hypothesis. Hypotheses are refined in the light of the new collected information or data (Garrison, Anderson & Archer, 2010:215).

5.2.2 Sustainable Learning Environments (SLE)

The concept of SLE is widely discussed in the literature, especially writings whose themes focus on education and development. SLE, as a concept, is important in this study, as it falls along a chain of outcomes that PBL is hypothesised to bring. SLE has been defined differently by various scholars and institutions. Within the South African context, *The 5th Sustainable Learning Environments Colloquium*, held in 2013, was important in the development of the definition of SLE. The definition states that a sustainable learning environment is one in which students have the capacity and ability to fully realise and exploit their potential, so that they can positively contribute to the needs of a democracy (Mahlomaholo & Ambrosio, 2013:8). These needs include enabling national development, reducing inequality, eradicating poverty and unemployment (Mahlomaholo & Ambrosio, 2013:8). In short, an SLE churns out students who have a positive impact on social justice. In agreement, Govender and Muthukrishna (2012:21) assert that, in an SLE, students develop into complete beings with strong knowledge and a quest for social justice. This is only possible through changes of academic curricula, such that it is focused

on developing attitudes and perceptions of concerning “social justice, human rights and social change”.

5.3 PROBLEM STATEMENT

To recap, this study was motivated by the problem that the conventional or traditional learning systems had been proven to be failing to produce a student who possesses pragmatic problem-solving skills, and who can easily convert knowledge into action. This problem resulted in the failure of graduates to apply themselves towards meeting the dire needs of a democracy, predominantly social justice, community and national development. As a result of noting this problem from various government reports, as well as academic literature, it was concluded that a PBL approach was a possible intervention that would empower students to be more practical and to contribute more positively to national agenda. This study dwelt more on the issues related to implementing a PBL strategy as a response to poor academic and professional performance of students. It was noted that, in attempting to implement a solution, i.e. PBL, new challenges and risks would also have to be addressed, to ensure effectiveness. There was, thus, a need to research these challenges and to come up with a workable PBL strategy that would empower students to be more contributory to the nation, in whatever professional capacities they would find themselves in.

5.4 RESEARCH QUESTION

The study’s research question was: *How to implement problem-based learning to support a sustainable learning environment at a higher education institution?* The study was guided by seven core questions emanating from the above, which were expected to provide comprehensive information on PBL strategy implementation, as a subject matter. These were the following:

- What is the justification for the need for the implementation of PBL?
- What are the components of the proposed PBL strategy?

- What are the conditions that foster the successful implementation of problem-based learning?
- What are the challenges and the risks that may affect the successful implementation of this framework?
- What PBL student behaviours are important in an SLE?
- What are the indicators of a successful PBL strategy?
- What are the perceptions of the students on PBL activities carried out in the study?

These research questions were drawn directly from seven objectives of the study, listed in Chapter 1.

The study aimed to provide strategic and operational solutions on how to effectively implement PBL strategies, as a solution to the challenges associated with conventional pedagogy. The solution is expected, among other things, to transform the current higher education environment into an SLE where students' potential can be fully realised, so that, in the end, they become fully functional citizens who can positively contribute to social justice, equality and nation-building. The next subsection presents the objectives that will guide the achievement of this aim.

5.5 CONCLUSION ON THE PRIMARY RESEARCH

This section concludes the findings of the empirical study that was conducted through PAR. The section below summarises the findings on each research objective, and concludes the objective, too.

5.5.1 Justification of PBL implementation

On objective 1, “to justify the necessity of implementation of PBL”, it was concluded that there was ample rational justification for the implementation of PBL at TUT. From the responses of the focus groups and the class observations, it was noted that PBL was an effective way of bridging the experience gap between tertiary college and the

professional world. Students, because they work with real-life solutions in class, naturally acquired real-life experiences that were applicable to industry. Additionally, PBL empowered students with a powerful arsenal of skills. These included problem-solving skills, communication and presentation skills, as well as team co-ordination skills. In addition, it can be concluded that PBL helped students become better learners and retainers of knowledge. It motivated students to learn, and also aided them in remembering the concepts and theories learnt. PBL was, thus, noted to be a creator of competitive advantages for students in the professional world. From observation, PBL indicated greater student interaction within diverse learning environments, created students who were able to effectively communicate and critique the status quo. Additionally, students were able to address problems that they faced. These skills and capacities point towards a studentship that can, in future, address national challenges, including social justice, transformation and the other needs of a democracy. There was a stronger support for PBL than there was opposition to it. Other quarters who did not believe in its justification used the arguments that it forced students into groups, and students did not like to learn in groups. Furthermore, it was highlighted that PBL would only benefit students from economically advantaged backgrounds, who had been exposed to adequate learning resources of that kind.

5.5.2 Components of PBL

On objective 2, “to describe the components of the proposed PBL strategy”, the study concludes that the key components of PBL were:

- Student-centred learning, with students heading content learning;
- Lecturers as facilitators of the learning process;
- Students taking full charge and responsibility of acquiring the solution;
- Working in collaboration with one another (group work);
- Student-to-student assessment or group-to-group assessment;
- Working with real-life cases (problems).

These components were not very different from those discussed by various scholars in the literature.

5.5.3 Conditions that foster the successful implementation of PBL

The third objective was “to investigate the conditions that foster the successful implementation of PBL”. It was concluded from the study that, while the institution was responsible in formulating and implementing a PBL strategy, other important stakeholders, whose consultation and involvement was important, were the industry and the students themselves. Students have an idea concerning the best learning knowledge, while industry knows what is required from a graduate, in terms of competencies, abilities and personal acumen. Additionally, PBL was more feasible in environments that were able to support students with the adequate and relevant theoretical and conceptual knowledge to solve problems, and this required resources of information, like the internet. The ability to manage students in groups was an important factor that came out of the research process. PBL, as observed and discussed, occurred in group settings, making group dynamics a factor that can either drive forward or stall the teaching and learning process. Institutions, therefore, needed to manage how students interacted in groups, and address group issues, including personality domination, passiveness by some students and unbalanced group workloads.

5.5.4 Challenges and the risks that may affect the successful implementation of PBL

The fourth objective of the study was “to highlight the challenges and the risks that may affect the successful implementation of this framework”. As PBL is student-centred, it was a challenge when students were not able to do presentations that formed one of the main knowledge-transfer platforms in PBL. At TUT, some students showed evidence of this challenge. Another challenge that was anticipated was that some students, especially those who came from disadvantaged backgrounds, where teaching and learning resources were generally scarce, would fail to cope with PBL. This is because PBL is a resource-based learning method, wherein students who were exposed to a

wide range of knowledge resources expected to do better. It was noted that traditional learning had turned into an educational culture that students are exposed to, from as early as pre-school stages. The process of introducing a new way of learning will, most probably, be challenging, as these embedded traditional pedagogy beliefs could foster resistance to change. There was also a view that changing into PBL could be overwhelming. This was due to time constraints in the changeover process, as well as having spent enough time already, working on and developing traditional teaching material. The issue of group management again came into the picture. Failure to effectively structure groups and motivate students to fully participate in them, was noted as a potentially serious challenge.

5.5.5 PBL student behaviours that are important in a Sustainable Learning

Environment

The fifth objective of the study was, “To identify PBL student behaviours that are important in an SLE.” In relation to this objective, it was concluded that PBL enabled students to learn to openly express themselves against any forms of undue domination. Three types of domination that came out were racial-based domination, gender domination and personality domination. In the study, students were able to speak out against these, indicating that protracted exposure to PBL would, indeed, promote the ability for students to contribute towards social justice, community and nation-building. PBL also showed that racial interaction and, therefore, transformation, can also be promoted through racially-diverse groups, just as gender relations and tolerance can be improved through continual interaction in gender-diverse groups.

5.5.6 Indicators of a successful PBL strategy

The sixth objective of the research was, “to identify the indicators of a successful PBL strategy”. From the findings in the previous chapter, it can be concluded that the successes of a PBL strategy can be measured from both a process and a solution perspective. The process perspective measures or assesses the extent to which

intended PBL processes have been successfully realised. The outcome or solution based perspective looks at the final objectives of PBL.

In conclusion, the process success factors identified in the study were:

- Student involvement;
- Industry participation;
- Theoretical understanding and wide knowledge base;
- Effective group management;
- Supportive educational system;
- Adequate implementation timeframes;
- Teaching resources;
- Conducive assessment practices.

The outcome-based indicators were concluded to be:

- Increased industry acceptability of students;
- Skills developments (communication, presentation, problem-solving, collaboration);
- Ability to contribute towards the needs of a democracy (SLE).

The study was, therefore, able to fully research on the above objective and to come up with conclusion on it.

5.5.7 Perceptions of students on PBL activities

The seventh research question of the study was “What are the perceptions of the students on PBL activities carried out in the study?”

This seventh objective and its research question aimed to assess student views, after having participated in PBL learning pilot projects. This objective focused on four main features relating to PBL, namely, the degree of student involvement during PBL, the level

of class activity, quality of professional knowledge acquired through PBL, and preference for PBL as a method of learning in the institutions of higher education.

The first feature interrogated the degree of student involvement as a way of finding out if students felt enthusiastic and motivated by this form of learning. This feature would also help to establish whether there were student barriers to learning through PBL. Furthermore, it investigated the perceptions of students, regarding lessons they received through PBL, as opposed to traditional, lecture-based teaching.

The second feature, namely, the level of class activity, was closely related to the first one – student involvement. This feature also had the same aims as the first one, although on a slightly different scale. Here, the level of class activity was investigated. Undeniably, the degree of student involvement determines the level of class activity. Where student involvement is low, class activity is low and vice versa. So the two variables are almost identical, both by design and intent.

The third feature relates to the quality of professional knowledge acquired by student, during PBL. Although this feature is related to the first two, it is not identical to them as it aims to discover whether the knowledge students acquired during PBL is of acceptable quality. For instance, can this knowledge be applied resourcefully in a workplace setting? This feature is crucial, because if students acquired knowledge through, for example, PBL, but they cannot apply this particular knowledge to real-life experiences, such as the workplace, then the knowledge would be useless and the type of learning through which the knowledge is acquired would have defied the purpose of education in the first place.

The final feature solicited a general view from students, regarding the preference for PBL as a mode of learning. This feature follows directly from the three above because, if PBL presents advantages to students and students are motivated to learn through this approach, then the students would see PBL as an acceptable mode of learning. However, the opposite is also true. If students are not motivated to learn through PBL, they will struggle to put into practice the knowledge they acquired through it. This mode of learning would, then, not be considered a preferable one. Within each of the 4 categories

mentioned above, findings from the focus group interviews with all the respondents were inductively analysed, presented and argued, with a discussion after each category.

5.5.7.1 Student Involvement

Students were asked to give their opinions regarding the level of student involvement during PBL. It was seen that student involvement during PBL was positive and academically productive. This is also evidenced in the literature reviewed, which bears further testimony that PBL motivates students to be more involved in activities, as it helps them to be self-directed in their learning. This kind of motivation to be actively involved in their learning is necessary for students, in order for them to be able to put what they have learned during PBL into practice, as soon as they go into the labour market.

5.5.7.2 Class Activity

Students were also asked how they felt about the level of class activity in a PBL setting. As the results indicated, while over 81,2% of all the participants involved in this study felt positively about the level of class activity during PBL, only 18,8% felt that class was negatively affected by PBL. As explained earlier, the higher the degree of student involvement, the higher the level of class activity. It can be concluded that the majority of the students involved in the study felt that student involvement and class activity is satisfactory during PBL, in comparison to traditional, lecture-based learning.

5.5.7.3 Preference of PBL

The last question posed to the group of participants concerned their preference for PBL, as a mode of learning. The responses received from the participants, in this regard, are interesting, particularly when one takes into consideration the responses to the previous questions posed to them. It might be appropriate to believe that these responses reflect a level of hesitancy and/or doubt. This is probably due to the novelty of PBL in the institution of higher education in South Africa.

As a conclusion to this subsection, the importance of the quality of professional knowledge, acquired during PBL, cannot be overemphasised. If students are found to have received knowledge which they are not able to utilise during professional practice, this is evidence that something is wrong, as the purpose of education would have not been served. For students to be resourceful in their future careers, it is crucial for them to be able to put what they have learned into practice, so that they would be able to solve problems, using that knowledge. If this knowledge can be effectively applied at work, it can be viewed as knowledge of a high standard or quality. In this case, students were asked how they felt about the quality of professional knowledge they received, during PBL. From the above results, it can be argued that the majority of students felt positive about the quality of professional knowledge received, during PBL. This sentiment is also shared by the majority of authors in the literature reviewed in Chapter 2. This can be attributed to the fact that PBL places more emphasis on hands-on experience of students, challenging them to be actively involved in their learning. Therefore, the quality of knowledge acquired during PBL is much better than theoretical knowledge, passed on from the lecturer or teacher to the students, during the traditional didactic instruction study.

5.6 PROPOSED PBL IMPLEMENTATION FRAMEWORK

The study unveiled 4 broad categories of factors that affected the support for or resistance to the implementation of PBL. These were organisational factors relating to the academic institution, student experience factors, educational system-related factors and external stakeholder-related factors. SWOT analysis, a concept that is mainly used in strategic planning disciplines, was used. In the data analysis chapter, data was eventually presented from a SWOT analysis approach, to facilitate the construction of a PBL implementation framework, with SWOT embedded in it. The factors from the SWOT analysis were classified into organisational factors (factors emanating from the implementing educational institution, student-related factors and broad educational and systemic factors).

5.6.1 Organisational factors

In the study, it was noted that the support or resistance that PBL can receive from the organisational structures of the implementing institution, is highly deterministic of both success and failure. In the case study, the identified organisational resistance factors were:

- Planning challenges;
- Limited organisational knowledge;
- Strong lecturer-based learning tradition;
- Teaching and learning processes;
- Stakeholder interests and expectations.
- Educational system influences

Organisations may resist or support PBL as a result of planning issues. A successful PBL strategy requires co-ordinated planning across organisational institutions and functions. In the case of TUT, these are the various offices of teaching and learning, i.e. the curriculum development offices, the offices of heads of departments and industrial liaison offices. These offices needed to integrate their views, goals and expectations regarding PBL. Due to the fact that PBL does not occur in isolation, the views of assessment offices, as well as their input, are also expected to be critical in the PBL planning processes.

Limited organisational knowledge was also highlighted as a possible resistance factor in PBL implementation, in the empirical study. The researcher took the duty of orienting and inducting other members of the committee that discussed PBL, as they openly admitted that they were not 100% sure about what PBL entailed. In addition, there were multiple views and debates on what PBL was and was not, as well as how it differed from outcome-based learning. The committee was fortunately able to come to a common understanding on what PBL was. This understanding (that also touched on the benefits of PBL), was strong enough to motivate the HOD to discuss the implementation of PBL with the board.

Lecturer-centred methods have been in existence for generations and, as such, they cannot be quickly and easily dismissed. In the focus group meetings, a strong belief and view that lecture-based learning was indispensable was noted, including among the students themselves. There were also doubts that the immediate replacement of the current learning and teaching method would immediately translate into positive benefits. These doubts led to the views that gradual, rather than full implementation of PBL, would be more appropriate.

Organisations, i.e. TUT perceptions of the implementation of PBL, were strongly supported by external views held by industry. The work world, as stated by the Lecturer and Industry Expert, were in dire need of PBL-enabled graduates. These graduates would be able to resolve organisational challenges and contribute, meaningfully, to national development. The comments from industry became a very strong source of motivation for the implementation for PBL.

5.6.2 Student experience factors

The second set of support and resistance factors were related to students. Student experience factors are any factors that affect the student's appreciation and/or capacity to cope with PBL. In the study, identified student-experience factors were:

- Demographic issues.

The demography of students was discussed as a major supporting or resistant factor in PBL implementation. In the focus groups, it came out that some students came from socio-economically challenging academic backgrounds, where learning resources were scarce. These students, unlike those from economically-advantaged backgrounds, are less likely to cope with rapid change in pedagogy. Due to their background, they required more support from the lecturer, and this made the PBL process, with its comparatively less lecturer-led modes, less appropriate.

5.6.3 Group participation experiences and perceptions

The group participation experiences and perceptions of students can either develop support or foster resistance to PBL implementation, as observed in the class activities. Students who had negative experiences with group associations indicated that they had not enjoyed the PBL exercise, and were not willing to continue to learn in a PBL setting. Negative group associations that influenced resistance were:

- Group leadership issues – group leaders not being organised enough to lead the group towards its objectives;
- Exclusion – some students resisted PBL efforts because they were not approached by anyone to join groups and were basically left out;
- Slacking group members – some felt that other group members were non-contributory to the learning process and took advantage of those who were;
- Groups too large – with some groups being too large, it was a challenge for some to fully co-ordinate their efforts as teams and achieve the desired results.

5.6.4 Personality issues (extroverts versus introverts)

Within the PBL set-up, personality issues became important because students interacted more as they learned under PBL than in an ordinary learning setting. Some students indicated that they were introverted, i.e. they preferred to work alone. Other also indicated that they performed better on their own. In the class observation exercise, these types of attitudes were easily notable, as some students sat aloof, quietly and uninvolved in the discussion and debates that were going on. At least one student stated that they had negative group experiences as they were growing up, and this affected their perceptions of working in teams.

5.6.5 Levels of understanding of the programme

Some students indicated that they did not understand, firstly, the goals and objectives of the class project they were conducting and, secondly, the learning and teaching process

that they were part of. This lack of understanding occurred in a background, where students were oriented in the project and were fully briefed about it. Even the lecturer, in the observation session, was seen offering what the researcher believes is “adequate guidance” for students at that level of learning. Nonetheless, it must be mentioned that differences in cognitive levels amongst students affected their perception of PBL. Conclusively, students who felt cognitively-challenged were more likely to resist the new PBL dispensation.

5.6.6 Educational and systemic factors

These are factors that related to the external environment of TUT, particularly the wider educational system and the social, economic and political contexts, from which stakeholders hail. In the study, these included:

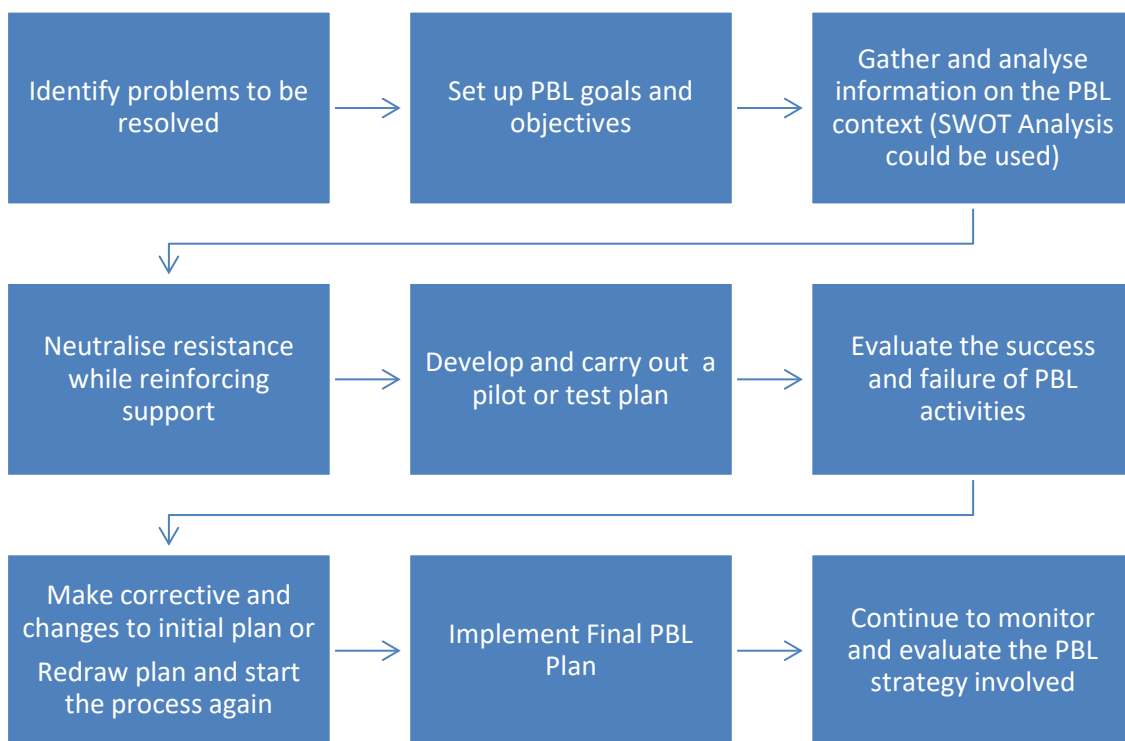
- The current educational system which does not support PBL;
- Socio-economic environments (students from poor backgrounds and their PBL challenges);
- Strong tradition of conventional learning and its resistance threats to PBL;
- The effects and power of industry in determining what a quality graduate should know.

These factors were identified across various objectives. For instance, the effects of the educational system on PBL came in as a challenge, identified under objective 4, linked to the research question: “What are the challenges and the risks that may affect the successful implementation of this framework?” The last point, the effects of industry, came out in the justification of PBL (objective 1), that identified industry as requiring problem-solvers, thereby, pushing the academic sector to produce graduates that met this criterion. That also came out in the indicators of PBL implementation success that identified that industry acceptance of PBL graduates was a major PBL implementation success indicator.

5.6.7 Final PBL 9-Step Framework

The researcher proposes the following PBL strategy implementation framework, which is based on the empirical findings from the data collection and analysis processes. The proposed framework consists of 9 basic steps that must be followed in the implementation process. All of these steps were carried out in the research, and the results that were produced are a conviction that framework will produce the desired results.

Figure 25: Proposed PBL Implementation Framework



Source: Researcher's own.

1. Identify problems to be resolved

- Poor application of knowledge to real-world issues;
- Sustainable Learning Environment gap;
- Poor social, economic, political transformation capacity;
- Low contribution to national development;
- Inability of educational system to effectively accommodate student diversity;

- Excessive dependency on lecturers;
 - Poor communication, presentation and problem-solving skills;
 - Low demand of graduates/poor market competitiveness.
2. Set up PBL goals and objectives
- Problem-solving skills development;
 - Presentation and communication skills;
 - Pragmatism and confidence;
 - Increased cognitive performance;
 - Team collaboration amongst students
 - Reduce reliance on the lecturer/facilitator
3. Gather and analyse information on the PBL context (SWOT Analysis could be used)
- Identify PBL support factors (strengths and opportunities)
 - Identify organisational factors
 - Identify student factors
 - Identify curriculum-related factors
 - Educational system factors
 - Identify PBL resistance factors (weaknesses and threats)
 - Identify organisational factors
 - Identify student factors
 - Identify curriculum-related factors
 - Educational system factors
4. Neutralise resistance while reinforcing support
- Engage stakeholders
 - Communicate benefits and clarify PBL process
 - Advise on anticipated risks and challenges
 - Provide information including literature on PBL

- Promote discussions and open engagement on PBL
5. Develop and carry out a pilot or test plan
 - Test should resemble actual PBL strategy
 - Involve all relevant parties in tests (students, industry representatives, lecturers, leaders)
 6. Evaluate the success and failure of PBL activities:
 - Evaluate student participation levels;
 - Evaluate student and lecturer preferences;
 - Evaluate facilitator/lecturer interaction with students;
 - Evaluate the outcomes of PBL on key components –
 - Group work;
 - Problem identification;
 - Problem solving solutions capacities;
 - Assessment methods;
 - Student presentation;
 - Communication;
 7. Make corrections and changes to the initial plan, or redraw plan and start the process again;
 8. Implement final PBL plan;
 9. Continue to monitor and evaluate the PBL strategy involved.

The above framework, based on the findings from the research, is best implemented within an Integrated PBL framework. Integrated PBL involves the infusion of traditional didactic learning aspects into a PBL curriculum (Gustin *et al.*, 2008:3-11). To recap, TDL, which is the current mode of teaching and learning at TUT, will not be discarded, per sé. It will be reintegrated into a PBL mode after noting that TDL also had some advantages to offer to the students. Below is the proposed Integrated PBL model:

Figure 26: Integrated PBL for implementation at TUT



Source: Developed by researcher applying the views of Gustin *et al.* (2008:11)

The above model:

- Acknowledges the challenges that some students will face under a pure PBL approach, as noted in both the secondary and empirical studies. A mixed approach would balance out these challenges, as students who fail to cope with PBL will still have a TDL as a fall back. Student issues and challenges include the following:
 - Personality challenges;
 - Poor group dynamics;
 - Lack of preparedness for lessons;
 - Unwillingness to lead the learning process;
 - Limited exposure to PBL and the subsequent lack of familiarity with it.
- It also acknowledges the challenges that lecturers face in introducing a new pedagogy, based on a different paradigm, i.e.:
 - The feeling of loss of power over students;

- The view that PBL means too much work for them;
 - Lack of knowledge and familiarity with PBL;
 - Frustration with students' low participation or non-participation in PBL.
- TDL is important in covering deep theoretical and conceptual parts of learning that are also important in student development. For example, in the group presentations, TDL was noted as the best method by which to teach statistics because it is a highly technical subject, entailing many concepts and calculations that require greater involvement of the lecturer;
 - TDL is the mode of teaching and learning that most students and lecturers at TUT are familiar with. An integrated approach creates an opportunity for both students and lecturers to become accustomed to and comfortable with PBL, while also benefiting from the familiarity of TDL. This, in the views of the researcher, smoothens out the process of change.

The framework above, however, was developed based on experiences from the TUT study. Its applications to other institutions may require further research. As an opinion, there is a strong possibility of its applicability to all universities and colleges in South Africa. The literature review generally pointed out these institutions, facing similar challenges with TDL.

5.7 RECOMMENDATIONS

In addition to applying the above-discussed framework in the implementation of a PBL strategy at TUT, other recommendations were also made. The recommendations mentioned below stem directly from the findings of the primary study. They are, therefore, relevant and tailored to the TUT as the studied case. However, they can be applicable to various other institutions in South Africa and beyond.

5.7.1 Neutralise resistance through education

It is recommended that educating all the stakeholders of tertiary learning, about the advantages and benefits of PBL, is one way of neutralising any resistance that may exist. Students, lecturers and tertiary education administrators all need to have a clear view of what PBL is, how it affects current learning and how it benefits society. With intentional programmes to educate stakeholders on PBL, students and other important stakeholders will be able to offer their own critique, get answers on grey areas and even contribute towards the improvement of PBL. The need to educate stakeholders was evident amongst committee members who needed to be inducted into the whole PBL process, so that they could contribute more meaningfully to it.

5.7.2 Gradual and phased implementation

Due to noted concerns, doubts, fears and resistance to PBL that were noted in some sections of the studied setting, institutions should consider introducing PBL in gradual phases. This approach has been recommended from the observation of the 4-week testing period, which itself represented, or could be equated to, a typical phase in PBL introduction. With gradual implementation, students and lecturers, as well as an administrative system, have a better opportunity to adapt to new changes. It reduces confusion and, therefore, the possibilities of lost learning and teaching time. Gradual implementation also contributes to the decrease of resistance as students get used to the new system.

5.7.3 Start at the beginning

While an institution cannot easily influence a change of the whole educational system, so that PBL is introduced as early as primary school, it can influence the earliest possible time that PBL can be introduced within its own system. Thus, TUT can consider introducing PBL in the first-year programmes, so that when students complete their studies, they would have mastered the new system and would have developed the necessary skills and expertise that come with PBL. Introducing PBL to third-year students

will not give them adequate time to get used to the new system, and to fully benefit from it. Additionally, introducing it in the middle of the curriculum was noted as a possible cause of resistance. Early introduction can, therefore, reduce resistance among students, enabling them an opportunity to benefit more from it.

5.7.4 Benefit from hybrid systems

In the study it also came out that PBL can be implemented alongside various methods of pedagogy. This process will make it possible for the discussed weaknesses of PBL to be neutralised by the strengths of other methods. The combination of PBL with outcome-based learning, as suggested in the focus groups, will ensure that students are motivated to develop PBL skills and expertise, as they will determine their study outcomes or marks. Combining PBL with the current lecturer-centred systems will enable lecturers to capacitate learners with current theoretical knowledge that may be a necessity in developing real-world solutions. In the study, the concept of “blended learning” was discussed as part and parcel of 21st century learning by the industry expert, who was part of the study panel. This recommendation is advanced further by the fact that some students may not be able to adapt to PBL, due to background issues that are coming from poorly resourced schools. A blended approach will take care of such concerns.

5.7.5 Capacitate students for PBL

Institutions need to capacitate students to benefit from PBL learning. This involves the identification of learning, interaction and personality challenges that make it difficult for students to adapt to PBL learning. One noted problem area was group interaction. Students resisted the PBL exercises given to them because of unfavourable group dynamics. From the start, students need to be taught and encouraged to work in groups and to appreciate demographic, personality and academic differences amongst them. Group leadership training, group communication and group administration issues are matters that can be improved through the learning and teaching process. This, therefore, challenges the teaching process not only to teach about the content of a course or subject, but also the context of it. In other words, students must be taught how to learn under PBL.

Innovative teaching methods, including technology-supported learning, could be used to make students PBL-compatible.

5.7.6 Develop an effective PBL assessment plan

It is important to develop an effective PBL assessment process that will ensure that students are motivated to perform to their potential when working in groups. The assessment plan should, among other things, reward groups with marks that contribute to their final overall assessments. Additionally the assessment plan should be able to identify the actual group members who would have participated in a group work exercise, and allocated marks accordingly.

5.7.7 PBL implementation as part of institutional strategy

As noted from the study, the implementation of PBL is a highly involving process. It affects institutions' stakeholders and processes differently, and may result in disharmony if not well-handled. Institutions, therefore, needed to craft an implementation strategy to reduce negative effects that the process may have on academic excellence and stakeholder morale. The 9-step process, presented above, is a typical implementation strategy that institutions may adopt.

5.8 CONCLUSION ON LITERATURE REVIEW

This study has discussed the critical emancipatory theory and also presented extensive literature review, related to the history and development of PBL in the past few years. According to Fals-Borda (1996) and Flood & Jackson (1991), critical theory of Habermas is a society-based theory that focuses on people's self-emancipation from structures of domination, allowing humanity to generate its own history through self-awareness. The end goal of this study is that education should move away from the teacher-led manner, which was didactic to the 21st century PBL. This study advocated the implementation of PBL in institutions of higher education. The expectations of the research were that, with the PBL approach, students would be able to contribute more meaningfully to the social,

economic and political development of a nation – through participation in an SLE. However, the study has also found that implementing this type of learning is no easy jaunt, as it requires commitment from academic staff, students, and management. It also requires changes in the broader educational system, sustainable implementation strategies and an investment in the form of resources.

5.8.1 Objective 1: To justify the necessity for implementation of PBL

The purpose of PBL is to make learning relevant and as close as possible to real-life experience for tertiary students. Dubinsky, Carlson, Hawks, Nicholas and Harel (2004:162), highlight that the PBL approach enables students to learn through engaging in real-life problems. Chirimbana (2014:152) further adds that PBL further benefits tertiary students, in that they are able to learn from their own experiences and apply problem-solving skills. The author further explains that PBL does not only enable students to solve problems, but also to identify problems in real-life situations, themselves. As such, PBL becomes particularly useful in the working world, where application of knowledge is vital. In view of this, Blumberg and Micheal (1992:6), Houlden *et al.* (2001:81) and Tsou *et al.* (2009:283), illustrate that a combination of PBL and traditional didactic learning, used in many international schools, has better outcomes than PBL alone or TDL alone.

Comparing the findings from the literature review to those of the empirical study, the benefits discussed above also came out in the empirical research. In the empirical research, as in the literature, it emerged that PBL was justifiable because it developed important skills, including communication, problem-solving, research, group dynamics management, among others. PBL was also observed as a method through which diverse interactions amongst students could be fostered, thereby, setting a stepping stone for the social transformation of a racially-divided South African educational and social system. In the literature, however, PBL emphasis was mainly on improving students' ability to apply theory to practice, with social transformation issues taking a lesser significance.

5.8.2 Objective 2: Description of components of the proposed PBL strategy

One of the critical components of PBL, as analysed through this study, is the use of small groups in problem solving. Dolmans, Lachman and van der Vleuten (2008:116) further indicate that the effectiveness of utilising the small group tutorials in PBL is affected by demographic variables, such as age, gender, educational levels and language. Notably, in PBL, the tutor acts as a facilitator and engages the students through guidance, rather than acting as a content expert. Alajmi (2014:144) further notes that the facilitator in PBL moulds skills in self-directed learning and self-assessment, which are critical components in PBL. Other important components of PBL were problem and case-based learning, the constructivist nature of learning, as well as the limited use or reliance of textbooks in comparison with real-life learning (Musa *et al.*, 2011:574; Ribeiro, 2011:3). One of the major components of PBL is that it is student-centred. Savin-Baden & Major (2004:4), further illustrate that assessment of students in PBL is performance-based and the measure of student assessment is done through assessing individual student progress (Pawson *et al.*, 2006:114).

In the empirical study, the components that were broadly discussed in the literature were mostly similar to those that came out of the study. These were student-centred learning, real-life cases and problems, the group work learning component, the importance of personal experiences, the role of lecturers as facilitators, student assessments and a high research component. A slight difference between the literature and the study was on the reliance of traditional learning components, especially textbooks and lecturers. The study found out that, even though students (and lecturers) generally preferred PBL, they still required the lecturer to step in as the leader of the learning process, and also the use of secondary research materials, like textbooks. Based on this finding, the researcher saw it fit to recommend integrated PBL where students benefited from both PBL and TDL.

5.8.3 Objective 3: Challenges and risks that may affect the successful implementation of this framework

Implementation of successful PBL, as previously discussed, requires an SLE, careful design, preparation of course material and knowledge of inputs required for teachers and students (Mahlomaholo & Ambrosio, 2013:8; Tick. 2007:364; Pawson *et al.*, 2006:114).

Lau and Talbot (2008:411), in a study on the importance of PBL from a students' perspective, concluded that PBL would motivate and encourage students to discover themselves and define their objectives. However, the authors note that students enjoyed the learning process of PBL more than the results (Lau & Talbot, 2008:411).

Another challenge highlighted in the implementation of successful PBL, rests on the issue of using small groups of 5 to 8 participants. Tempelaar (2013:207) highlights that group diversity may influence the efficiency with which groups work. Dolman *et al.* (2005) concur with Tempelaar (2013:207) that various demographic variables in the group, such as age, gender and educational level influence group dynamics (Dolman *et al.*; 2005:732). Similarly, the challenge of the facilitator monitoring group processes, and keeping the group focussed, is discussed by Hmelo-Silver & Barrows (2003:256).

Expanding on facilitator qualities for successful implementation of PBL, Cianciolo *et al.* (2010:16), examined the effect on PBL in terms of instructor characteristics, professional development and competencies. It was found that instructor development of PBL and student-centred learning have to develop the facilitation competencies and management of classrooms that foster instructions, to indirectly shape events in the classroom and respond appropriately to student needs (Cianciolo *et al.*, 2010:16).

The above challenges were, generally, in agreement with those that came out of the study. The literature, like the empirical study, seemed to point out student-related factors as the main challenges in the implementation of PBL, followed by a facilitator or lecturer-related issues.

5.8.4 Objective 4: Conditions that foster successful implementation of PBL

One of the conditions discussed, that foster successful implementation of PBL, is an SLE. The SLE is one in which students have the capacity to fully realise and exploit their potential, so that they can positively contribute to the needs of democracy (Mahlomaholo & Ambrosio, 2013:8). Tick (2007:364), in a study on application of PBL in classroom activities, highlights that PBL offers purposeful and real-world communications to support undergraduate and graduate students to study how to perform with and study from different sets of people, horizontally and laterally, within a community of learners (Tick, 2007:364).

Pawson *et al.* (2006:114), in a paper on analytical assessment of PBL in geography, notes that for successful implementation of PBL, there has to be careful attention to scenario design and the preparation of the course. The author further infers that, for successful PBL, there is a need to analyse situations where PBL applications have not been performed well, as well as knowledge of the nature of inputs required for teachers, students and others (Pawson *et al.*, 2006:114).

Overall, the literature identifies a host of factors and stakeholders that are important in the successful implementation of PBL. These include willing students, lecturers, faculty staff, adequate resources (human, infrastructural, financial), an enabling curriculum with relevant problem development and assessment aspects, and a supportive leadership. In the study, all these factors came out as important, indicating a strong agreement between the literature and the empirical findings. On a slightly different note, resources were not indicated as a major implementation challenge at TUT, although it was mentioned in the discussions.

5.8.5 Student behaviours in an SLE that are important in PBL

Visschers-Pleijers, Dolmans, Wolfhagen and Van der Vlueten (2005:732), through a questionnaire survey, indicate that for successful implementation of PBL, there is need to foster behaviours, such as good conflict resolution, cumulative reasoning and exploratory

questioning, to foster the successful implementation of PBL. Additionally, the authors note that students need to have been properly inducted into PBL for the success of PBL in an SLE.

Albanese and Mitchell (1993:60) draw on the conclusion that, although students enjoy learning through PBL, they do not always excel in examinations, when compared to students taught through traditional didactic learning. The authors further elaborate that students utilise their problem-solving skills and authenticate their decisions in PBL. Chirimbana (2014:152) notes that, since student groups are used in PBL, one of the enabling factors that facilitates this is the stronger students teaching the weaker students and, as such, collaborative skills form a pivotal component in the sustainable implementation of PBL. Barret (1996:17) recaps this, noting that student behaviours of team work, self-direction and communication skills, play a crucial role in collaborative learning in PBL.

The literature presented various advantages of PBL and these seem to agree with the disadvantages that the study participants discussed or showed through their observed actions. At the same time, the many above advantages that were discussed by the various scholars including Albanese and Mitchell (1993:60), Chirimbana (2014:152), Visschers-Pleijers *et al.* (2005:732), were all observed to apply to the empirical study.

5.8.7 Objective 6: Indicators of a successful PBL strategy

The implementation of a successful PBL strategy requires successful processes and outcomes of the PBL. The process to develop self-guided learners who are motivated to find solutions through PBL, as described by Lau and Talbot (2008:116), is indicated by the students' enjoyment of the learning process. The author further notes that success of the PBL process is indicated by the level of engagement of the students during the learning process, and does not only mould the events in the classrooms but also creates conducive conditions for adaptability in the work environment (Cianciolo *et al.*, 2010:16). This, in turn, culminates to an environment where the indicators of success of PBL are increased employability of graduate students (Cianciolo *et al.*, 2010:16). The findings from

the literature and the empirical study were similar, in some instances. These include the skills the PBL developed – and that these were important indicators of PBL success. These skills include communication skills, group-interaction capabilities and problem-solving skills. From an SLE perspective, findings from the literature also pointed towards PBL as being capable of leading the transformation of society and creating students with social justice appreciations. While in the study the sample did not directly indicate that the development of an SLE was a success indicator of PBL, it was implied from the skills that were identified, the diversity and group-work elements, and the problem-solving capabilities that came from the observation that PBL would, indeed, be able to effectively transform the educational playing field.

5.8.8 Objective 7: Students' perceptions of PBL

Within the literature, students expressed various views on the processes, activities benefits and negative aspects of PBL. Various global studies were consulted and these included experiments that compared PBL classes with TDL classes, as well as opinion gathering researches. Students, in the secondary research, expressed 2 common views. The first view was that PBL was a positive development that had many benefits, including the ability to remember learned content easily; the ability to draw upon past experiences (Yam & Rossini, 2015:294-295; Ribeiro, 2011:12-13); the ability to benefit from group work; the development of many industry-relevant skills (Smith *et al.*, 2013:217-18; Ustun, 2006:421) and the generally interesting and motivating aspect of PBL (Ribeiro, 2011:3-4). Other students, however, cited undue group domination; poor group co-ordination; poor or limited life experiences (Yam & Rossini, 2015:294-296); limited support from facilitators (Ates & Erilymaz, 2011; Yeo, 2005:510) and unfamiliarity with the mode, as negative aspects (Wood, 2003:328; Yeo, 2005:510). The negative views that students raised in the literature were, generally, the same as those that came out of the empirical study. Likewise, the benefits that students in the empirical study mentioned were similar to those from the literature.

5.9 LIMITATIONS OF THE STUDY

This research was done diligently, using methodologies that were discussed as appropriate for a Participative Action Research approach. However, as in any research, it had its limitations. These are listed below:

- As a case study of TUT, the findings from this study may not be readily applicable to other institutions because of institution-specific factors;
- The study, despite its interest in Sustainable Learning Environments (SLEs), was not able to assess whether students would be able to contribute effectively towards such an environment. This was because it is a long-term indicator that can be observed, in period, beyond the study's time-frame.
- The study's focus group approach relied on one representative from each particular area, such as a lecturer representing all the other lecturers and one industry expert representing all the other experts. This approach could have resulted in the failure to collect different views that might exist among other non-represented parties, and among represented parties with different perceptions of PBL.
- Finally, as a PAR, the researcher's influence could have affected the independence of other participants' views. For instance, some may have chosen not to argue against his views, due to various reasons.

It is the researcher's view, however, that the research, due to the diligence that was applied, is valid, and is an honest representation of PBL implementation strategy and related subject matters, which have been discussed in this document.

5.10 RECOMMENDATIONS FOR FUTURE RESEARCH

The recommendations for future research, made in this section, emanate from the knowledge and information gap that research identified while carrying out both the secondary research, through the review of written sources, and the primary research, namely, the participatory action research (PAR).

5.10.1 Factors affecting student behaviour in group work exercises

In the group exercises and the focus group interviews and, indeed, the literature, it emerged that group dynamics were very crucial in the successful implementation of PBL. This is because PBL was generally a group-focused learning and teaching method. While the researcher was able to ascertain that personality issues, gender and racial domination and the structuring of the groups could be important factors that affected group work effectiveness, the researcher is convinced that there is more to it than that which the study was able to cover. The researcher, therefore, recommends a future study that purely focuses on group dynamics in PBL setups in South Africa, as a way of uncovering psychological, sociological and anthropological truths that could prescribe how group behaviour can be improved to ensure the effectiveness of PBL strategies.

5.10.2 The effective integration of PBL with other learning and teaching methods

In the study, there were discussions relating to the various possible learning and teaching methods that could be integrated with PBL to achieve similar outcomes. For instance, in the focus groups, 2 participants dwelt on the Outcome-Based Approach (OBA), which unfortunately, was not defined and described in detail, but hints were that this could somehow be infused with PBL. In addition, one participant also wanted to know how the PBL related to traditional learning and teaching – that is, if PBL and TDL cannot co-exist. The above knowledge gaps require further dedicated research, particularly from a South African perspective, to give the findings greater relevance to the local situation.

5.10.3 Student and lecturer perceptions of the SLE

The concept of an SLE was widely discussed in connection to PBL, in the literature. However, in the research, despite the researcher/team co-ordinator's attempts to steer debate in the SLE direction, there was not much input from the panel. As a result, the empirical information concerning the transformation of the educational system into an

SLE, was deduced from the observed class activities through the use of Critical Discourse Analysis (CDA). This situation points to possible information gaps on how students and lecturers perceive their roles in the creation of an SLE. There is also the need to test their understanding of such an environment. The researcher, therefore, recommends a perception-based study of SLE, pertaining to the tertiary student body and its lecturers.

5.10.4 Quantitative methods in assessing and evaluating the successes of a PBL strategy

Lastly, the researcher recommends the development of a model that supports the quantitative assessment of PBL outcomes. It was noted, in the study, that most measures that were used were of a qualitative nature, making it a challenge to compare results from one case to another.

5.11 CONCLUSION

To conclude, this study has been quite interesting and eye-opening on many levels. Firstly, the concept and process of PBL, until this study, was just a theory at TUT. The study was able to put PBL theory into practice at TUT, and to highlight several important facets of PBL, that were presented as goals of the study. These formed the justification for the need for the implementation of PBL, the components of PBL, the conditions that foster its successful implementation, expected risks and challenges, PBL and SLE, indicators of a successful PBL strategy and student perceptions of PBL. The study tested old theories and confirmed that an integrated PBL strategy, as discussed in literature, was the best strategy for TUT. In addition to testing the applicability of existing theory, the study came up with its own new contributions to the field of education. The 9-step process, in PBL implementation, is considered a unique contribution of this study. It draws upon theory and combines various strategy implementation aspects, including SWOT analysis, into a single, tested framework that educational institutions can adopt, with or without slight modification to suit their unique circumstances. Another important contribution that this study made was developing a link between PBL and SLE. In literature, these exist as

independent concepts with little or no relationship. In the study, it was proven that, indeed, PBL can contribute towards the transformation of South Africa by churning out students who are ready for real-world challenges. This finding was particularly exciting to the researcher, considering his interest and dedication towards social, economic and political transformation of South Africa, for the good of all its citizens and residents.

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6 APPENDICES

LIST OF APPENDICES

Appendix A.1	Ethical Clearance
Appendix A.2 permission	Letter to Faculty of Arts requesting
Appendix A.3	Consent Form for participants
Appendix. A.4	Confirmation for Focus Group Meeting 13 June
Appendix A.4.1 2012	Agenda for the Focus Group Meeting 13 June
Appendix A.4.2	Transcript for the Focus Group
Appendix A.4.3	Attendance Register Focus Group
Appendix A.5	Groups/Teams Classroom Activity
Appendix A.6	Groups Presentations
Appendix.A.7	PBL Students Feedback
Appendix A.8	Data Analysis Coding

Khosana Tladi

From: Mahlomaholo Mahlomaholo [MahlomaholoMG@ufs.ac.za]
Sent: 19 June 2012 05:21 PM
To: Khosana Tladi; letsiele@qwa.ufs.ac.za
Subject: Tladi Khosana Feed back from CTR

Dear Ntate Tladi

Congratulations! Your CTR application was approved on condition that the following improvements are made by June 29, 2012. Dr Letsie will assist and he will forward your corrected documents to Mr Andrew Barclay, if they are received after June 29 they will not be considered.

1. The title on both CTR 03 and CTR 021 should read: The implementation of problem based learning towards a sustainable learning environment at a higher education institution (**no capitals or bold or anything please**).
2. Please make sure that the whole proposal is language edited by a professional and provide proof thereof to Dr Letsie as many language errors were identified.
3. Please also provide indication as to how you will monitor progress and determine when you shall have achieved the objectives of the intervention and the study.
4. Give more detail on what research methodology and the data analysis method will be applied.

Regards

Sechaba

Sechaba MG Mahlomaholo
Professor in the Faculty of Education
University of the Free State
Room 121 Winkie Direko Building
Nelson Mandela Drive
BLOEMFONTEIN - 9301
0711 375 106 and 051 401 3420



University of the Free State: This message and its contents are subject to a disclaimer.

Please refer to <http://www.ufs.ac.za/disclaimer> for full details.

Universiteit van die Vrystaat:

Hierdie boodskap en sy inhoud is aan 'n vrywaringsklousule onderhewig.
Volledige besonderhede is by <http://www.ufs.ac.za/vrywaring> beskikbaar.

Appendix A.2
permission

Letter to Faculty of Arts requesting

Dear Prof M. Sirayi

Executive Dean

Faculty of Arts

SirayiM@tut.ac.za

012 382 6051

DATE: 08 MARCH 2012

**REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY IN THE
FACULTY OF ARTS (DEPARTMENT OF VISUAL COMMUNICATION).**

I am an enrolled PhD student at the School of Education, at the University of the Free State. The Title of my Thesis is "***Enhancing Effective Implementation of Problem-based Learning towards Sustainable Learning Environment***"

I would like to conduct my empirical research in the Department of Visual communication as they fit the profile required by the research project. My research is centred of around enhancing effective implementation of problem-based learning towards sustainable learning environment. It will therefore require the participation of the students, lecturers, administrators, curriculum designers, employers and community members. This research will aim to provide the need for problem-based learning as the approach of delivery teaching and learning in a classroom, the components, and threats and support mechanisms for the enhancement of the approach to assist towards the sustainable learning environment.

If approval is granted, administrators, facilitators, curriculum designers, students will participate in the study, and those who volunteer to participate will be given a consent form to be signed (**see attached copy**).

In adherence to the ethical considerations as determined by the University of the Free State, the thesis and individual results of this study will remain absolutely confidential and anonymous and only used for purpose of completing the degree and adding value in the future research in problem-based learning as a method of delivering teaching and learning.

I sincerely hope that my request will receive your favourable consideration

Best Regards,

K. Tladi

STUDENT NUMBER

2000038105

Appendix A.3

Consent Form for participants

Researcher:

Khosana Tladi

24 Soetelief Street
Pelliessier
Bloemfontein-

T: +27(0)12 382 5435

F: +27(0)12 382

Study Leader:

Setjhaba Mahlomaholo

University of the Free
State, Room 121

Winkie Direko Building
Nelson Mandela Drive
Bloemfontein-9301
T: +27(0)51 401 3420

Date:

25/06/2012

INFORMED CONSENT:

Dear Participant

I would like to invite you to take part in this research project:

The Implementation of problem-based learning towards a sustainable learning environment at a higher education institution.

This study is about enhancing the effective implementation of problem-based learning towards the creation of sustainable learning environment at Tshwane University of Technology.

We would like you to participate with us in this research because your presence as Senior Lecturer/ HOD in the programme who will be able assist with the implementation of the problem-based learning approach. The Head of the Department as a lecturer will further be exposed to the role of being the facilitator and share with team how did he /she experienced the role reversal

The reason we are doing this study is to develop a framework for enhancing the effective implementation of problem base learning at Tshwane University of Technology towards sustainable learning environment.

The possible risks to you in taking part in this study may include sudden emotion, such as anger and fear, strong annoyance when the discussion are perceived to be personal or threatening in nature as well as normal daily risks such as physical injury or discomfort as you go to the site of the study. In what may seem major incident or risk, the researcher must stop the process immediately and report the risk to the relevant department of the Institution so that the necessary precautions and actions can be taken.

I am sure you will benefit from this study as the team will be creating an opportunity for the professional development of the lecturer. If the lecturer further understand the trick of problem-based learning as a mode of delivery for assisting students with deep level of understanding the delivered content of the subjects, the throughput of his or her programme will drastically increase that will also emancipate the confidence of the said particular lecturer.

While I greatly appreciate your participation in this important study and the valuable contribution you can make, your participation is entirely voluntary and you are under no obligation to take part in this study. If you do choose to take part, and an issue arises which makes you uncomfortable, you may at any time stop your participation with no further repercussions.

If you experience any discomfort or unhappiness with the way the research is being conducted, please feel free to contact me directly to discuss it, and also note that you are free to contact my study supervisor (indicated above).

Should any difficult personal issues arise during the course of this research, I will endeavour to see that a qualified expert is contacted and able to assist you.

Yours sincerely,

Mr K Tladi

Please fill in and return this page. Keep the letter above for future reference

Study: Enhancing effective implementation of problem-based learning at TUT towards sustainable learning environment.

Researcher: *K. TLADI*

Name and Surname: Prof Rudi de Lange

Age: 55

Head of the Department

Contact number: 012 382 6185

- I hereby give free and informed consent to participate in the abovementioned research study.
- I understand what the study is about, why I am participating and what the risks and benefits are.
- I give the researcher permission to make use of the data gathered from my participation, subject to the stipulations he/she has indicated in the above letter.

Signature: _____

Date:

Khosana Tladi

From: Rudi Wynand De Lange
Sent: 22 May 2012 11:31 AM
To: Khosana Tladi
Cc: rogerdedodger@gmail.com; wessel@bigdoor.co.za; veronicak@gmail.com; thamoh.mthetwa@gmail.com
Subject: RE: Problem Based Learning Approach (Help)

Khosana
Hi

Yes we are all still on board. My apologies for replying so late. I have gathered persons and students that can serve on the panel and was only a min or so ago to chat to the last person (Wessel Hamman) from industry.

We have the support from 2 students, they are willing and keen to participate:

The students have exams, exhibit and must submit their last project on 8 June. They will start their work integrated learning on 15 June.

I would therefore suggest that the only and best time to arrange a meeting would be between 11 and 13 June.

The students are:

Veronica Kgekong 0732660830

Innocentia Mthetwa 0734742789

The persons from Industry are:

Roger Andrade rogerdedodger@gmail.com

Wessel Hamman 012 3621385 wessel@bigdoor.co.za

Wessel did mention that he might be able to find a more knowledgeable person in his place – he will come back to me. I will keep you informed.

I have c.c. the potential participant to keep them informed.

Let me know how I can help.

Kind regards
Rudi

**AGENDA
13 JUNE 2012 AT FACULTY OF ARTS CAMPUS**

ITEM	ITEM ACTIVITY	COMMENTS
1	Opening and Welcome	
2	Objectives	
3	Introduction of the task team	
4	Background	
6	Logistics	
6.1	Frequency of meetings	
6.2	Venue for meetings	
7	SWOT	
8	CLOSURE	

FOCUS GROUP MEETING CONVERSATION (13 JUNE 2012)

Researcher: Maybe we can look at logistics in terms of, you know, on how to begin to look at how we deal with the matters. The most interesting part it will be item number seven in terms of the agenda. The most very important part of all discussions we will have today. That will take the whole scenario of what is happening presently in class, and what is actually the output of what is expected by the industry out there. And within the methodology that is the hypothesis on the table, one is moving from the premise that, if you put that into practice or into action in a class environment, that could actually bring a difference in what type of a graduate you are producing out there.

I don't want to be biased and say it's the *halala* type of a methodology. However, some of the things as we go on we can unravel.

For example, I know that in many of our institutions they are not using problem-based learning approach they were using mostly of the institutions are using outcomes-based. And outcomes-based approach and problem-based approach are brothers and sisters, because the other one has things that the outcomes-based does not have. And in many countries where problem-based education has been put in action; it has brought lots and lots of positive results.

And if you listen to the Minister of Higher Education, he says to us, as institutions of higher learning, I'm looking for a graduate that, the minute the graduate finishes his career/his discipline /his course, that graduate must be able to hit the office and run. Which we know in many instances it is impossible, but we are dreaming, and hence I think the methodology as well says; if you do it properly, you know, you will have students at the end of the day that will be able to take the knowledge that the student has learned from the process to integrate it out there into the community, that's number 1.

To also critically think about the things that are supposed to be done within the working class or the working world. So these are some of the things that the problem-based approach would actually bring. But, before we go there, we need to start with what is it

that we have currently, you know, hence we will be dealing with the SWOT analysis a little bit in terms of – as we look at the present scenario, what are the strengths, what are the weaknesses, what are the opportunities, what are the threats, and out of that, what is it that we can actually bring in terms of a plan of action and at a later stage that will begin to address the outcome that we are looking at.

Are there any questions?

Sounds good to me

Industry: I take it now that this is now relating to Graphic Designers, as the study area...was this a general approach?

It is probably general to just teaching...

Yes

It's not related at art school

General but for tertiary education...

Yes, mostly for tertiary education

HOD: But with the application, what are we gonna do for the 3rd-year students?

Third-year students are students in Design and Multimedia

Yes, Design students...

Industry: Now, I just want to make sure because now am sitting here and am not 100% sure that I must sit here.

If it is designer related, then I can contribute, but then if it is not, then I can't.

No no no... You are sitting at the right place Ntate, because for us to make a meaningful enhancement in terms of what is the industry aspiring to see from the graduate, the inputs that you are going to bring will actually make an effect in what in terms of what type of a methodology and the teaching approach we are talking about. So if this works in the particular application that we are going to look at, then it becomes a case study that we can actually explore in different fields.

Student1: Mme Innocentia, am I right?

Yes

Researcher: You are welcome

Student 1: Sorry am late

Researcher: No no, am told that in South Africa we are never late, we are being delayed.

I was looking at the agenda, and at the agenda is that I just did a little bit of the opening and the welcome. And the objective maybe is to look at the objectives a little bit.

The objectives as Prof Rudi de Lange has actually highlighted, I'm trying to, I normally say it in a very affirmative way, am not saying this is what I've said to Prof, am not studying towards a PhD, I'm trying to upgrade my studies. In a very affirmative way, because the minute you say it the other way round, you begin to distance yourself from the other people, and hence am trying to say also the methodology that we are trying to put in place influences what type of things we need to say because the methodology says as we are all equals, we need to treat each other as equals.

I'm not coming here, in terms of paper work yes, I might be saying I'm researching towards a particular type of a qualification, but as we sit around, the information that we are going to share, we are all equals in terms of the information. The only thing I must do behind closed doors is to interpret that information so that it becomes an academic writing, which is where now I'll have to struggle behind closed door to say now how do I make this thing, the information an academic writing.

So the objectives of today, as you look at the proposal, somewhere on page four even when you don't have page numbers there, there is a one...two...three ... four...the fourth page that talks about the research design and methodology. The research, design, and methodology. Maybe let me start there at the problem-based statement so that between the three and the fourth one they go together. The problem statement as given it says: what this task team together with me will aspire is how, you know Tshwane University of Technology could implement a problem-based learning education with the intention of

enhancing the effective implementation of problem-based towards a creation of a sustainable learning environment.

Now, as we go through that, below are the objectives that will assist us to achieve that. Now first objective ***is to display and justify the need for the implementation of problem-based***. As we go back to the SWOT analysis together, am running them concurrently. If you go to the SWOT analysis, there is a wing that talks about the weakness. Now, what is the present status quo? And, if the present status quo as we share them does that necessitates a particular approach which would address the issue of the need.

Now the second objective says: ***to identify components constituting such a framework***. Already there are many components within problem-based learning. However, it is not given because the contexts are not the same. You may find that you may have five of them, but as we talk around here, we realise that no, for us in terms of this particular project that we are embarking on we only need three. And how do we begin to enhance those three? How do we begin to make them work for us so that we get the good product or the throughput? ***And now we can explore conducive conditions***. For this to exist or to happen positively, what more else do we need to look at? What are the conducive environments? In many countries when you talk about problem-based, if it is not an institutional mission approach it fails. If you don't empower because you have a lecturers that for example, not to say lecturers are doing it, you have lecturers in the class, who some of them are reciting the context or the prescribed books. But here we are saying, you can't continue prescribing. The students themselves must get involved in facilitating their learning, because at the end of the day they are out there as individuals. So as they facilitate their learning, at the end of the day, they end up becoming assertive, confident about themselves and they can begin to engage with one another and they can negotiate and navigate their work environment.

The anticipated ***risk that may affect the implementation of the framework***: you get into a class, you introduce this problem-based education, students are there, they are saying this thing ***is nonsense*** it is a waste of time, we want a lecturer that can stand in front of us what is actually going to happen in this class.

HOD: It seems they might become full of rage

The students at the end of the day are the beneficiaries, and if we introduce a particular approach, and they are not receptive to that approach, as a lecturer standing up there you need to have a plan B.

Researcher: I think that is why Ntate Rudi here was saying if there's Plan A and Plan B, if Plan B does not come right, then we fall back to Plan A. However, we would have explored. What is important is we capture this as a divorce, and the last part ***is to explore the implementation of the framework***. What will be most important for us will be the feedback. If you have participated as a student in this project, what is it that you have benefited? It does not mean that if it has become a failure in one pillar at the end of the day it is going to be a total failure.

In other countries where they have introduced it, students will tell you that, this thing is a cumbersome process. It's a paperwork issue; we don't understand what is happening, and all those sorts of things. But, in many institutions like as we talk now, doctors are into this problem-based education, because they take, they go into a hospital, they put the patients there, and say look here is a patient: the patient has got diabetes, look at alternative ways of beginning to deal with that particular problem, which is diabetes. And as they begin to engage with one another, they come up with a collective problem-solving mechanism, and at the end of the day, they put a proposal, and then the patient, two weeks down the line/ three weeks down the line it becomes a success.

So these are some of the things that we are going to actually embark on, and as we embark on, are they going to assist the receivers out there, the end users is the industry? Are they going to say to the students, the industry is waiting for such a graduate?

That's number three.

Now number four, the research methodology is at the both level of collecting data and the intervention phase. Now the intervention phase will focus on designing and testing out a framework of which is geared at creating sustainable learning environment in the Faculty

of Arts, with the specific focus on the Department of Visual Communication in Arcadia Campus. That is where we are around the table now. And to further co-ordinate and enhance the effective implementation of problem-based learning at the Department of Visual and Communication, in the Faculty of Arts. I know that when I spoke with Professor, there were two options, because of the reasons that, problem-based is not a practised approach presently, therefore the option that we can look at is to introduce it and make it an introduction of it, which becomes very interesting.

Lecturer: Am sorry Khosana... there is just one thing...if you can take us back a bit. What is actually problem-based learning?

At the moment we use outcomes-based learning. What is actually problem-based learning? I do not really know what it is. I just need to understand it better.

What is the difference between problem-based and outcomes-based?

Industry: I think what he explained now is with medical students is: when you go with the students to the hospital in a practical situation. And the patient has got some sort of a problem, and you say how are you going to solve the problem before being told whatin the other way you would stand in the class and say this is what it is...this what it looks like ...and this is what you do, in this case students themselves actually gives the solution to the problem. So I think that's how the process will unfold.

Ohh! Thank you very much.

Researcher: That's the simplified *version* of it, which gives it more... Yes Ntate,

HOD: Can I just ask the same thing... the students must just respond as well....that means when we will do this module with the students the next quarter; that we've got to make it/ they've got to know that they've got to be able communicate directly and tell them they are fed-up or to say they like it, it works well. Is that correct? Yes.

Researcher: But they will be able to do that in the class, because I'm also exploring with them.

HOD: Would you be in the class with us?

Researcher: It will happen that I'm in the class; or it will happen that I'm not in the class, because some of the things can happen in the smaller groups; hence I was saying probably the person from the curriculum development, if that person was here would be able to take how do we design that particular module within the context of problem-based. But I do not think it is going to be a train smash, we can still do that as time goes on.

Now in adding to the version of what is problem-based, there is another page here that says: is an instructional method characterised to construct knowledge and develop new understanding (which is page 2) and a variety of subject-specific, as well a high order of thinking, and transferable skills in a structured small group learning and supported by a facilitator.

Now, in this instance we used to have a lecturer in front of us, but in this instance we will be having the same lecturer, but the lecturer is not going to be a lecturer but is going to be a facilitator. Is going to facilitate the groups, like for example, as you said Ntate, we are going to give a group of students an assignment: to say let's look at the super-slim shake/shape here is the super-slim shake/shape, what is actually the problem about the super-slim shake/shape?. You as a facilitator you are only an expert, an overseer of the process because if they get stuck in that process, you have to un-stuck them.

HOD: And that means I must move away from a lecture classroom, to a room where a person can walk around, work with smaller groups, and the facilitator: who will be the facilitator?

Researcher: The lecturer could remain the facilitator, but remember that if you are a lecturer you come up with prepared syllabus and notes and say: Today we are going to talk about cellphones...and this is the meaning of the cellphone. And if the cellphone gets stuck you go to Vodacom, but here now we have to come up creatively so with.... hence we are involving the students in this process so that as we design that particular module, they form part of it.

Industry: Just to me, from my experience, there's one problem that arises is: what does the student know, what to look for, if he has not been trained to a certain degree to look for certain things. How does he know this is a slim-shape, but without a bit of knowledge,

or general knowledge of what design is all about, etc., he does not really know what he looking at. Do you understand? I think he first needs some basic knowledge to be able to know what to look for. Yes....

Look I do not know much about this, but to me that's the problem, it is definitely a problem. You must know what to look for before you can comment, especially when it comes to design. The students must have some basic knowledge...I don't want to talk too much...

Researcher: That's the right approach Ntate and, remember, we are talking about the third-year students. And one assumes that, at third-year level,... **forget about that, we are talking about the third-year students...at that stage he already knows. Am going back to first-years...now you are right...**

So you are with us now...

And that definition further says: it is intended to strengthen student thinking and learning abilities. It is as well designed to help students to construct an extensive and a flexible knowledge-base and develop effective problem solving skills, and develop self –directed life-long learning skills, and effective collaborators, and become intrinsically motivated to learn. Now, these are some of the things that as we put this methodology on the table, we expect students to do that. And what is very interesting is, when students begin to struggle with the problem up to a certain extent, certain things like self-directed, self-regulated approach comes up. Now because at that time you will have one student that says: but no man, we've been sitting here and struggling so long, why don't we do 1,2,3,4,5....and you find that students are beginning to collaborate and negotiate among themselves.

HOD: Question: The groups...is it the self selection or smaller groups or do we break them up or mix-up the groups?

Researcher: We can break them up and we can make up the groups. It is upon us.

I would just like to make a comment from the industry side.

Industry: That is you must remember that if a student has finished his course, and is qualified as a designer. When the designer gets into the practical side of things, it's only

one **cob in a big wheel**. The designer in many cases has got no contact with the problem, has got no contact with the client, does not even come out of the work station. Am just mentioning this because, the problem-based thing, the problem is most probably it is going to be a problem that will be put there, very clearly: this is what we need, you need to design a brochure, you need to design a presentation, it is not going to be so wide that the student is not going to be able to know what's going on. That's the one side of it. The other side is that, because of technology, because of the situation we are in, the students today need to know far more, generally, not about the specific subject matter, generally, than ten or twenty years ago. And it is because also of the media that we got.

Talk about general knowledge of subject and things...

Am talking about

I know general about all sorts of things...and we trying to push that at some stage....

Lecturer: Talking about general knowledge...students must concentrate on variety of aspects... General knowledge, they must submit a lot...they must know all sorts of things...

Industry: What I wanted to say basically is that there is goggle. You can know you can get anything by just goggling it. Whether you are a designer or a doctor or whatever you are you know. So it is not as if students don't have access to all the knowledge that there is, I think that it is not something to be scared of, this problem-based thing, is not something to be scared of, but I think that students tend to be taught from, Pre-school, they tend to be taught that this is the teacher, and the teacher teaches. So you are getting people that gets into this point where we are now, that's being, that's been trained in a specific way, the way of working and I think you almost need to unlock that as well. That's almost like an intermediate stage when you unlock and say listen, because: if you come to me, and I'm a student now, now we have to do this new way of doing I will immediately say no I do not like it. I'm not going to say I like it, and I think that you have to bridge that by making sure that you just turn the key first before you get into it because in actual fact, I think it is far easier to do it this way. I think there is more stress on the lecturer because he does not have a goggle in his head all the time. So these people are going to do

research and get a lot of information, and they are going to come to him and say what must I do here and what must I do here. If you are talking about groups, if you have six groups in the class, and each one of the six groups will come up with other challenge, and that's what is good because it's problem-based learning.

So now the problem is, I'm thinking of the poor lecturer as well...and then the bridge between the institution and the world out there. You know, I always say to students when they apply, you know what we expect from you, is to come and teach us. You've just been taught the latest, you've been involved in the latest and we a company that is dealing with what is going at the moment, we expect from a student that has just finished his course to come and tell us what we should do. And they think the opposite way, they think I need to come and work for you so that I can get experience. Now if you do it in a problem-based way that is almost as if you bridging a bit of that problem of experience. Because we have already solved the problem, I can immediately give you a problem to solve.

Researcher: Am getting more excited, because, the two of us when we engaged with one another, we thought we are the only people who are thinking in this direction. And I think after that input, we are realising that the industry out there is actually talking the same language that we are beginning to be worried as institutions of higher learning, to say, we need to produce students that are ready-made already.

Lecturer: Khosana can I tell you last year I spoke to a couple of guys in the industry, theatre directors. From three studios/agencies ... and one of the things that came on top of their heads....what we really wanted is thinking designers, people that can solve problems. Typically, if I've given you a campaign, here's the whole campaign, you must go and see what the clients wants for that campaign; they must not be told what to do, they must think the whole thing out, problem-solving thing is good practice, problem-based is good practice. For the people that live here, or practice in thinking the problems out already, like if I presented this, look at this thing here, what is the problem with this, the client needs that. What does the client need to advertise this problem; in other words they must be thinking designers, not just do this and they do that; they must know why they are doing it; they must be able to solve problems.

Industry: I think the term 'problem' is a problem.... It is actually a challenge not problem....

When you say something is a problem, then people think it is a problem. But, if you say it's a challenge, because, if I give you a job, I'll say this is the challenge, this is what we need to solve, get a way out for this challenge; then it's a different approach, a different way of looking at it. Am just mentioning that, because I think what you are saying. And as I'm say again, we expect from the qualified student to come to us and to give us something. We do not expect to give them something. And that's why, when they come to us, they sit there and want to eat from the XXX....and they don't get paid very well. If they come there and they give me solutions from day one, they get paid very quickly and they grow very fast. And that's just another way of looking at it....

Lecturer: It's because they are adding value ...it's a value-adding process. If you go and work somewhere, you must add value. You must be able to solve all sorts of problems/challenges, instead of what Wessels says, just sitting there and just taking...

Researcher: I'm going to make this thing very interesting now. I think you have shared with us what is the industry expecting out of us. Am going to ask this very nice thing to students: to say, what has been said by the industry out there, do you think at the current moment, with the way....I know that it might be an introspection to ourselves, as an institution: the way we are delivering, you know, the modules, the courses, is/are we responding to the challenges of the industry... be honest the everything is behind closed doors: nobody is going to kill you... because, if you listen to what the industry says: the industry says out there, this the challenge, we want somebody that can add value, that immediately when you graduate, when we give you that certificate, as you go into the industry the following day, you'd be able to add value. Now with the way we are running the current things that we are doing within the institution, the approaches that we are talking about here. Are you sure that you will be ready to do what the industry is looking out there?

Industry: In other words would you be would you be able to meet the challenge? After you leave 3rd or 4th year, you go and work for design studio or agency or whatever, do you think you'll be up to the challenge? If the guy comes here and say, listen: here this client wants you to design a campaign; this is a problem or challenge or a campaign; do

you think you can do it? Have you got the background to be able to do all the thinking you can do all the thinking work that it takes to design this campaign for example?

Because that's the sort of people that they need out there... ok, look, different people they need lots of different people.... I think the top people are going to be the people that can really think for themselves, and solve problems, and still want to call it problems, I'm used to tell you guys this is all about problem-solving, each thing has got its problems, and design is about problem-solving.

After the 3rd year or 4th year, do you think you guys will be up to the challenge? That basically what this is asking you?

Student 1: I'd like to think so, and the implementing the problem-based education would in a way improve that; with regards to the fact that, as Mr Wessels mentioned they'd rather have someone who is prepared to take the challenge and meet that challenge and come with results on how they have dealt with the challenge.

Industry: Would you feel almost, sort of sure of yourself?

Would you feel competent enough if you were given a problem tomorrow? Listen, this is what you must do....

I think what is difficult is like as I said in the beginning, you must realise that you guys, when you start, you don't start and go and do everything. You are not running a company, you are running a campaign, and maybe you are going to be involved only in a certain part of the campaign. When there is an art director will tell you what he wants... this is the part of the problem that you must solve, it's not like this whole challenge is now yours, solve it you know, You tend to do it like that when you study, you think you get a bigger problem, but it does not work like that out there, you get a section of the problem, and I must say that these days what's more important, and what's more relevant. What makes more of an impact is more of the personality rather than...one person might have all the tools, is been given all the tools, but when he gets to the challenge he hasn't got the confidence. Whereas another one has got half the tools, but he's got overly confidence, and he'll do it. So what we say is get yourself sorted out by solving lots of problems so that when you get there and you are being given the problem, you are able to solve it.

and that's what you must know. Now I think it's difficult because I think if you think what the problem will be, you think in terms of what you've been studying, what you've been doing now, and it might be slightly different to that. And also as XXX has mentioned, there's different levels, there's different ways of working. All the agencies do not work in exactly the same way. You know, there's internal agencies, there's places where you can go and work, where you are working for the Auditor General, has got the old graphic design department, they do everything themselves, but they still come to us because there are certain problems they just can't solve. They do have the confidence, and it's because the vision is been narrowed because of the fact that they are on the inside. You go to the outside, you got challenged today by Vodacom, tomorrow by Gucci, the next day, so you, it becomes very confusing, that's why you got to goggle it, you know what it's about.

This is what the art thing is all about, it's to change talent, and people have got talents, to mould the talent into the practical approach, to get you to use your talents. And I think if the lecturer becomes the facilitator, that's actually what he facilitates. He must see that this guy is good at that, and he can handle this sort of thing very well. So I must help him and force into a situation where he gets to develop that because that ...anyway when you get to the industry you get to the right plane, you going to immediately go in there, and they are going to love you because you are doing what they want you to do. And I think what you have to tell us is: yes we think with what we have at the moment we will be able to do that, or you will be able to say no, I think we need more of this practise in this, practicing the challenging thing, you know, I think that's what it comes down to.

Student 2: I also agree, I think that it's going to actually encourage students to want to learn more. Because at the moment I also feel that to a certain extent, we are sort of spoon-fed, with the lot of stuff...at the moment you get to 3rd year, that's when you actually start realising that, oh no!, we need to start doing work ourselves, and that's when we start realising that we've been spoon-fed all this time, and you...so I think it's going to push us to want to learn more, and obviously we are going to be more competitive and more competent in the work place ...so I think it could work.

Researcher: It is encouraging to hear that. You know in the humanities world, they call it problem-based. But in the engineering world they call it project-based, and there is no difference. The difference is that, in humanities is problem-based because they deal with problems of human needs, but in the world of engineering and art, it's project-based because you particularly focus on a particular project. But, the fundamentals and principles are still the same. What we are saying is, if you deal with that particular project, you still have to be confident enough to can run with it alone, to become a loner, and when you are given it we say, this is the project, this is the challenge that am supposed to do, then tomorrow I must deliver. And as I deliver there, the director of art, of artistic should be saying: wow!

But, because as you said, we are now beginning to be spoon-fed, you'll continuously say, but I can't unlock this, where is my director, I need some advice. Whereas out there they are waiting for you to exhibit because there is a need, and because they know very well that you are from the newly developed institution of the Tshwane University of Technology.

I'm beginning to love this discussion because it actually opens up a lot of things. Am I right Ntate? A lot of things are coming out, and I would imagine if we would go to the whole class what would happen. It is going to be a very interesting process.

Industry: Maybe you see another... you see I also do not want to talk too much. I think one of the problems that we have on the inside is that, in practice, what happens a lot is partnerships of two or three. You don't do many jobs on your own. A lot of success lies within a situation where you've got two designers working together. The one has got certain traits, and the one has got others. The one has got certain type of personality, the one has got another type of personality, put the two together, and you've got fantastic solutions. Each one on their own, if you say, because you said you have to do it alone, do it all by yourself, each one of those would not succeed alone. But when they are together, on a team, they do it. The guy in South Africa, Mr XXXX received the most accolades; he's actually got even medal from the Science and Art Council. He is the first guy ever from the advertising industry to get that. He has never worked alone. It's one of his creations, but it was not created by him alone, he's got a partner, a small guy, this is

a very big guy. He's got a partner, I know them, and the small guy is the one that ignites and the big guy is the one that comes with the story. The small one does not feel secure enough to do it, but the big one will do it. So it's, in their case, this one won it because he is the big guy and, but actually they should get it together cause it's always the team that did it. And what's interesting is: they started in Jo'burg at a agency, they were head-hunted and they went to the next agency, they still together, and they are now in Cape Town. They've right through to Cape Town, they are still together. They get head-hunted as a group, and they don't have the confidence in not working in a group. Now I've got a close experience with my daughter...is also in the industry, she's got a partner as well, and they work together, and they now having an art exhibition this week. Which is now like extra-mural art exhibition, where even the art that they do, they do it together. It is not even one person's exhibition, it is a dual exhibition.... and the work that they prepare/ present is done by two people and not done by one. So it is very important for us to realise that the problem that the lecturers and the people that's doing facilitating, the problems that they have in this situation, because you have to actually realise that this is the people that will work together rather than on his own, and allow that because you are talking about problem-based. If the problem gets solved by three people together better than one then you have to do it.

Lecturer: We give the students projects like, at least one project where they get a project as a group,... it's like groups of three or four, and they have to perform this project together. It is to experience a bit of this working together and solving problems together. But I must say the students don't really like it. They don't like it, because I always get the problem, I see it with Jason today. You get three guys working on a project, and only one or two are pushing or pulling their weight and the rest are just, ehh, you do...

Industry: That's in a way a bit of a forced grouping... if there are challenges out there, and am in the company, and I'm the facilitator there, I see then ok, in this case I think XXX and XXX are the people that will do this the best, then I will tell them you solve the problem. And am not saying you alone, but you all must solve the problem. And then they do it. You are also going to have a facilitator in the end, but people won't be able to

pinpoint and say ok this guy is coming up with certain things that if we put this in combination, it will work.

Listen, do you know what the big thing is that the students don't take this too seriously. If you tell them, guy, you must work as a group, because pushing your own weights is not going to bring you any new ideas, and you don't solve this thing. And you know, you see this, you guys must correct me...they don't take these things too seriously...I think it's just the make-up of the way it works. They don't see it seriously enough. Maybe they will do now in third year, I don't know, but in the first year you don't take it seriously. At least I've seen most of the students don't take it seriously, and they just want to get this thing done.

Researcher: Ok, now, you see what we have done, we have already gone to number seven in the discussions, and I think, which is good...and that's why I say, order sometimes it doesn't work. And we are there already. Now the question that I'm going to pose forward here is: After, well said and done, what do we think then will be a possible approach, to try and, am not sure how I'm going to put that. To try and alleviate this dilemma that we have? Remember we need to put out there, a ready-made type of a graduate without saying the present doesn't give us the best. We say the present does give us the best. However, how do we enhance the present to make sure that as students go out there, they are ready-made?

HOD: Let me come in here, that is where I sitsorry because, ehh, the facilitator, but the next quarter must get their students, and make them industry-ready, in terms of the one little module that is pre- and post- testing. Now, I exaggerated a bit, but my easier term last year wasn't really like that, it was talk and chalk. When I stand in front and tell what you read and tell you to write an essay...then they do it for me, then I mark the essay and them their marks...and it's not really like that....I assume that you must tell me, and I must hear from everybody else the work that must do ...you guys are ready for ... is that right? And you can the check how it's done, and put in as well that eventually thislet heareach one is happy with you... and then when I report to my head of department, or my divisional head he says: mhh...nice done...students are better prepared than last year. So I assume now that I've got to get input from ...because I've got three weeks to

get myself orientated, because when we get back the next quarter, that's when I've got to implement this particular module.

Researcher: However, let me chip in there, because this is, it's a participatory action research approach, therefore it means all of us, even when the burden is going to be with me in the class, but it means all of us must be contributing to the enhancement of what needs to be delivered in class, so that as it happens in class, we have all contributed to that. So which means now, the students because they are the beneficiaries, they must be saying, if we can start now, we do 1, 2, 3, 4, 5, and then we come back and say again this is how we have structured it, and in the next quarter when we start, we hit the road with it.

Student 1: Ok, I have a question. Is this going to be applied to only one subject or to all the subjects that we are doing?

HOD: At this point in time we are focusing on a portion of one subject.

Can I just make a comment? To a certain extent, I believe that many of your practical subjects have got elements of problem-based learning, because it's project-based. Roger you might not know about this, for theoretical subjects, it is outcomes-based, but we can use the problem-based approach in research or training of the skills in this particular knowledge management subject.

Lecturer: You know I see a problem here. Am busy with the first-years, I used... method for the last three years...and this thing with problem-basedI was actually going to suggest whether we should not go to the students and ask them: now, how do you think we should teach you? How would you like to be taught, how, how must we teach you? Should that be problem-based? Must I give you problems to do? Then I'm just a facilitator, and then I help you? You come and tell me I must help you, you have done this and this....fix this and this should not work like this because of that, and so I facilitate the project for example?

In other words, maybe the students should as a class, come up with ideas and tell us how they would like to be taught. Because I think they've got a pretty good idea of what's going on outside there in the world. They know a hell of a lot more I think than we think, you know, and maybe they've got some good ideas on how they should be taught, and maybe they must be let us know how should this thing work. And I say now there's another problem. Because of the background... because of the composition of the classes, and the different background you get the guys that are, that would like the problem-based teaching, and then the guys that would like to have the sort of conventional teaching, where they are told what to do. I can tell you right now, you know, that percentage is probably going to be maybe 50:50, or maybe 60 for the problem-based teaching, and the rest maybe for the guys who would actually would like to know...to say it quite straight, this the poorest students, the students who have not almost been like exposed as much as the lot of the students, they have not been exposed to the sort of things, so they need a lot of help, and I think those students are going to be, to want to be taught in a conventional way, I can tell you right now. Am convinced that there is going to be a percentage like this of two groups that one would like this and that would like that. To me that's almost like how do you solve that sort of thing?

Industry: I think a system like this, is not something like you can take 3rd years and then say, now from 3rd year we are going to do this. You take first years and say this is like this. This is like an education system, it should actually go back to Pre-school, that's where it needs to start, because by the time I get to 1st year, and then I would be able to tell you what I prefer and what I do not prefer. I don't think they are in a position to do that....

Lecturer: But that is the dilemma of the education system, it's actually, it's as if it must be taken right back, it must be sorted right at the beginning. I don't know if this makes sense or not.

Industry: Look, I think of I take your project that you talking about, you know, a designer is not going to really get involved in research. It's never done. You get a researcher to do research, a designer interprets the research together with the team, i.e., You know a guy

that's very much into that kind of thing, but, if the designer does not know anything about research, and about what research is all about, they are not open to that, they don't know how to ...adding some value. They can only add value if they know how it works. That's why it's important for them to know that. So in the case like that, I still think that the problem-based approach would be better, because there is the problem, solve it with research, you know. It would still work in the long run if you put this together, it would still work better than telling him this is how research work. You know I was a student, we use to do that, he drums it to you and it runs to the other side, you never know. I mean we had classes in marketing, then the professor from Unisa (Wyers) then he does like 3 or 4 classes just on the theoretical side of the marketing, very interesting. You know it's entertaining, it's a bit of entertainment and it's over. After that, you know nothing of marketing, you know. If I had goggled, and I could goggle marketing, then I could go and study, and go where I'm interested, follow what I see, that I would be far more educated than what he told us.

Lecturer: It's like everything Wessels, if you force yourself to do a thing, if you are forced to fix this engine yourself, go and fix it, you will learn a hell of a lot, if you do it yourself, you do problem-solving, and you remember....

Industry: You saying exactly what I wanted to say...you can't let the students decide on something like that. You have to give them the problem, and force to them the problem that they do the problem, otherwise you never going to do it right....

Lecturer: That's what am saying, there's a good percentage of students that are going to struggle a lot...

But again, I understand what you are saying...

Industry: You have to start somewhere and hopefully if we prove that in a small way it works, it can, and the more it gets extended, the better it would be.

I think, as you said in the beginning, there's a lot of similarities between outcomes-based approach and this. And it's not so different; it is just that maybe being doing it by yourself part is stronger ...because of the industry...

HOD: Just to make a comment on should be on systems... I think you've already answered that, you said educational science tells us that the worst form of learning is talk and chalk, because it's one way of communication. Other side of the spectrum like you said already, it's when people actually apply and do a thing, and when a motivation is there. And I assume that this problem-based is right there.

Researcher: Now I hear what: Ntate Rudi has already put there, the challenge or the problem to us which now we are going to actually apply the problem-based learning to ourselves. Yes the next term: what he says is, yes, we agree that, in trying to bring the change of the type of a student is awaited by the industry out there, we need to come up with a different approach. And this different approach is: how do we begin to influence this different approach? What needs to go in there? I mean we need to hear from the students, students should be saying to us now: we think if you look at 1, 2, 3, 4, 5, it will actually make us ready, all and above what is existing. Remember we are talking about the enhancement of the implementation of a particular model. To say, if you look at 1, 2, 3, 4, 5, that will begin to assist us to be ready ...so what we are saying is let's look at....

Yes Mme. I can see your hand.

Student 2: In answering your question: I think another way we can use is like, for example, if we get assignments that are going to be marked, students usually take an initiative to look at research because the primary motivation is that you want to pass. So, say for example, you get a certain topic that you have to deal with, I think it would be better if maybe like you are saying now that if we work in different groups , maybe get different groups, and assign them different topics within the module, and then get them to research it themselves, and then as an incentive sort of, tell them it's going to be for marks, maybe it would count for 3 or 5 %, or then if it's not for marks, then it's not for marks then they are not going to put an effort because it's like, why do I need to do it? if

it's actually for marks, then maybe we could do like a kind of presentation within the class, as a form of a lecture. You actually get more, and you actually cover a lot more than you would have, had you just been lecturing and telling them what has to be done. So I think it's another way of how we can use it.

HOD: Topics, groups, different things, must be for marks, students think. I think it can work a lot better. How important is this marking thing. It's very important.

Student 2: Because to an extent that if you get a project, and you know it's not for marks, then you say, let me rather focus on the stuff that I know is going to count, as opposed to stuff that I know is not going to count. Because you feel like it's a waste of time where you could have put in more effort on stuff that you know you are going to get marks on.

And how are you going to get these different topics?

Well I guess it's the variety of the content you are covering. So, say for example you gave us **content analysis**, for example, and you say we must do research there. And then maybe a certain group focuses on **thematic content analysis**, and another group **focuses on frequencies** and then within that whole broad topic, you've actually covered segments of different topics, but then within the same thing and then, say maybe by the end of the class, you've covered maybe six sub-segments of one big topic that maybe could have taken you something like three weeks to cover in total.

Researcher: Thank you, thank you very much.

So, with this approach, you think that all the rest of the things like, negotiating yourself , discussing among the group, getting conflict resolution, problem-solving, getting independency in your presentation and in your argument, as we take this type of approach, will that begin to address your present challenges of your ...

Student 2: Yes I think it does, because another thing that, another problem or challenge that we faced with, we find that some of the students are not very comfortable in presenting or putting their ideas. You find that they've got very good ideas, but when it comes to presenting them they are not very keen on presenting them. But the more we cover we motivate them and encourage them to do certain presentations and so they

become more confident, and speaking towards certain people and then by the time they get to the industry they've already got that confidence that Mr Wessels was talking about, of being confident in whatever that you are going to present even though it might not be the best idea but the fact that you have the courage to actually speak to somebody about it and try and convince them that it should be the way that it should be done, I think it works.

Researcher: In so saying, you are saying even when the idea is not the best, but the way you present it becomes the best.

Lecturer: But the thing is, the idea might not be that good, but fact that you've gone through the thinking exercise is ...problem-solving, what am I...the fact that you've done the research, just that already is very good because that forces you to think.

Industry: I think I'd just like to say something about the marks that you mentioned. The fact that you doing things for marks and in the end you need to really work because of that, that's the outcome you are looking for. In the industry there is no marks, you either get the job or you not get the job. It's a very black and white thing, you pitch for something, you do everything as good as you can and it's the best if you give it, but you still don't get it, you know, you still don't get the job.

Lecturer: There is no reward.

Industry: Everybody should realise that, you know, if you can't get 80% for everything you do, then you are not in it. You do not even have to get marks, if you do not get 80% you are not going to get it, you won't get there. The only one that will get it is the one that has got 80% as the background, then we do what we do. And then you know, her little piece of difference between getting it and not getting it, and I think you should not even feel bad, you should learn to cope with it because that is what is going to happen to you. You are going to win some and going to lose some. But the losing player is also got 80%, it's not like is as if is only the winning player who has 80%, it's just that there is a lot of other emotions getting involved now in this decision. And because of that, you might lose the pitch, but it is not to say the pitch was not good enough. And I think that with marks

we tend to think,... I was like that at school, you know these people always worked hard at school, if I can just pass, am happy, I do not care how good I do, I just want to pass. Now I know it's the opposite, you have to know, you must get 101% in everything, and otherwise the competition is just too stiff, otherwise you are not going to make it. And today, there a lot of guys that is qualifying in your field. So there is a challenge out there, just getting a proper job and getting acknowledgement, and getting the opportunity to solve a problem is a big one already.

Researcher: Now my next question Ntate Rudi is: ...are there...that you have scheduled? And I can say now that Ntate Rudi is... eish, now there's a lot and lots of workthe question I'm trying to find out is: how do we begin to now put ourselves into a smaller (nyana) task team as we are, so that we can contribute in developing, to be ready for the next term, after the recess, am I right?

How do we begin to come together again, to look at what we are preparing for, for the next session? Because as we prepare it, we should also anticipate that this will be the outcome. Will the outcome be of an assistance to address the challenge that we are talking about?

Because, as a participatory team, am feeling ashamed to give him the whole job... maybe we need to say okay, the four of us together with the students, and because the students are the beneficiary of this, can we sit down and work around and see because this is a participatory action approach.

HOD: Could I as a non-industry, and a non-student person make a comment? Is that the concept you made make ...I mean from your side it makes sense, which means after we do something which is going to be motivational for students, we could also have the age gap and we've got a bit of an industry gap, and what industry will find useful. So, yes, maybe from my chair, sitting as an administrative office with comments ...as we work together, but then I need critical comments from the industry as well... to say we come up with a proposal, I have to do that within the next three weeks we ...you, me, us, propose to tackle the first lesson, or the first contact session....now we get a feedback and see

well...it is not going to work for me, ...from your side as well. Then that will be helpful. At least when I walk in to the class next week, I'm prepared, because whatever I've got to, of the worksheets and whatever, we can do that in the next two or three weeks, before the end of June or the first week of July. So you are going to take this.....

Industry: I can just suggest that, one, with this sort of thing, I do not think we must try and solve or you must try and solve the big problem. I think you must rather start with something simple, and test the idea, rather than trying to do something, and make it so complicated that it is almost you are not able to judge whether it is working or not. I think you must do that, very simple, take now a very small step, you can take bigger steps later. But I think you should do something that is very achievable, in a way almost easy, not make it too complicated because I think you can shot yourself in the foot...

Researcher: Now, the other question is, I've heard what Ntate Rudi is saying. Ntate Rudi, what you prepare will be tabled in our next meeting. Am I right to say so?

HOD : I take that as an order from the committee.... because, look, I can see a lot of benefits for the students, if I do the thing right, as the facilitator/as the lecturer, but I must also guard against the pre-conceived ideas about talking and chalking as it is always easiest option for us. So if you say then I have to prepare something, and submit to the next meeting, at least for critique and comment, I'll take that as a decision, or as a request or as a suggestion. At least I can take it from there, taking consideration of particularly the comments that you made, I think they are pretty valuable. The comments from the industry as well, I think, particularly the comment that I will never do the research, but I've got to know about it, and I assume that I will get hold of the report that happens to be interpreted, to apply the results. Yes and they will actually do something other than being told what to be told how it is done. Yes I've accepted your suggestion.

Researcher: So, the next recess, the next term starts in July... 15 July....so, whatever we do, we have to work within the month of June. Which means now is the 13th, and then next week Wednesday is one week, and the end of the month will be two weeks.

HOD: I'm still here till the end of June...I'll be staying the whole week. So will it be fair to you to say end of June we meet again. Look, to me it does not matter because I get paid for that.

Researcher: Then you've got two weeksso what will be the next date?

Student 1: That will be the 29 of June, it's a Friday. That's a Wednesday. The 29 of June, it's a Friday.

Researcher: Is Friday fine for everybody, the 29 June?

Industry: Does that include us? ... Yes

Student 1: It'll be on holidays.

Industry: I know we are going for 10 days somewhere, and am not sure, my wife sorts out all holidays... am not quite sure where am going to be.

Am very sure, the 29th am on the plane to Switzerland, so am not going to be here, and am not going to be available for another two or three weeks.

And I am not sure if I'm going to be around. I know that we are going away, but I'm not sure of the dates, but I know towards the end of the month...towards the month into July.

Student 2: We are also going to be doing our internships.

Researcher : Let us work behind closed doors, the three of us, and see if we can rope in some of the students, and come up with what is proposed today, and then...

Give comments or what? Give comments on the proposals?

Yes, and then when we are done with that, we send it to the round-robin, and then there are inputs, and then we sort it out. And the when we re-open, we hit the gun.

Will that be okay with everybody?

All: Yes, that's fine.

Industry: Look I just want to say that, initially I was not aware that this is an on-going thing. I thought that we had the meeting today, it's two hours, and am out of here. I do not

mind helping out, but at certain times I do not have all the time available, and I do not want to do something if I'm not there to do it properly. We appreciate that Ntate Wessels, hopefully that when we are done from the class that will be the end of our engagement, but me and Ntate Rudi and the students will be taking that further.

Research: This meeting, and the meeting where... if there was going to be another meeting, it would be a meeting where we would look at the proposal. However, because of the unforeseen circumstances, we will do the round-robin, and then after the round-robin we can therefore say, okay, the round-robin is done, we've gone into class, and then our last meeting could be: what did we achieve with the presentation in the class. And then we can come and look at it and interrogate it, and then that could be our last meeting.

HOD: Then I'll need you to check you emails, especially say, next week sometime, and then we could give critical comments, and also eliminate the age gap...

Researcher: Thank you very much ladies and gentlemen. This could be an administrative matter here. There's a form that I've attached inside the folder, and I will request that you just sign it and bring it to me. And the rest you can keep it....

Which one is that...the one with a paper clip, I just need that part of it, and then the rest will...

All universities require this....

We just need to sign this one? Yes, put the details there, cell number, and then you sign.

The FXXXX...I've gone through that...yes the Protocol....and they gave you clearance ... we are sorted out.

Including criteria...no no no....

The inclusion criteria will be students and industry...that is not a matter....

Ladies and gentlemen thank you very much for your time and energy, hopefully as we unfold this, this will actually give an added value into the institution-wide, because, I think

what we are trying to do here, as small as it is, and if it becomes successful, let's fund it within the bigger picture of the institution, and thing will go...

Thank you very much for your time.

It's our pleasure

Appendix A.4.3

Attendance Register Focus Group

ATTENDANCE REGISTER: ARTS CAMPUS - 13 JUNE 2012

NAME + SURNAME	SIGNATURE	DATE
1. <i>Lucy de Klerk</i>	<i>[Signature]</i>	13/06/2012
2. <i>Venicea Hoymans</i>	<i>[Signature]</i>	13-06-2012
3. <i>Reya de Klerk</i>	<i>[Signature]</i>	13/06/2012
4. <i>Roosje Legette</i>	<i>[Signature]</i>	13/06/2012
5. <i>Aras Arslan</i>	<i>[Signature]</i>	13/06/2012
6. <i>Emilie Althoff</i>	<i>[Signature]</i>	13/06/2012
7. <i>Wendy Hamman</i>	<i>[Signature]</i>	13/06/2012
8. <i>Ms. Nesamuni</i>	<i>[Signature]</i>	13/06/2012
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**Tshwane University
of Technology**

We empower people

History and Theory of Graphic Design III (HTG310T), and Contextual Studies III (CTX300T)

Assessment number 4 and supporting information for the pre-testing learning area
Time devoted to this learning area: 4 weeks

Title:	Post-testing, a group report
Due date:	14 August 2012
Weight:	6 %
Assessment:	According to Rubric
Submission format:	Hard copy

Introduction

Learning Unit 4, Pre-testing, requires you to have sufficient knowledge to 1) discuss the process of pretesting visual communication products (VCP), 2) you must be able to develop a series of question to be used in the pretesting of a VCP and 3) actually pre-test a VCP.

Read copies of article no 3 to 7 in the reading material handout and download article no 2. The URL for article 2 is given in the reading material. Pre- and post-testing are similar. Do not be too concerned about the small nuances between the pre- and post testing processes. The principles are the same. This pre-testing learning consists of several round robin contact sessions in Studio 3. We will follow a problem based learning approach to arrive at the learning outcomes.

Background to this learning module

Advertisers use several techniques to gain consumers' attention. In print advertising, they use a combination of visuals and text to gain attention and to communicate a specific message. ASASA's Code requires that advertisements must be honest, truthful and they must be able to substantiate the claims that they make. A vehicle manufacturer must for example be able to substantiate a vehicle's fuel consumption and must provide the conditions under which the vehicle is tested. It is not sufficient to provide testing figures obtained in another country and in conditions that do not prevail in South Africa.

Pre- and post testing enables us to gain a gist of how consumers interpret a message before it is released onto the market and post testing allows us to identify where we went wrong with an advertisement. We will focus on the process of post-testing for the reason that there is an abundance of post-test material available.

Advertisers are however allowed to puff with text and visuals. Puffery is a method whereby an advertiser exaggerates a products benefit to such an extent that a reasonable reader will not



believe the message and will understand the exaggeration and puffery. An example is when a motor manufacturer states that his car is so nice to drive that it will put you on cloud nine. A photograph of a car driving in the clouds might accompany the text. Hyperboles are also allowed where advertisers use humour to sell a product. Nando's in SA is a good example.

Advertiser must however substantiate all claims explicitly made or implied by text or visuals. Visuals are vehicles that advertisers sometimes use to make claims that cannot be said with words. A visual may imply a certain quality that the product cannot deliver. Complaints become difficult because the advertisers may argue that the implied claim is the result of the complainant's interpretation. Advertising regulating bodies however, have become more vigilant and attend to the implied and hidden claims of visual messages.

A good example was a recent ruling in the UK. The UK's Advertising Standard Authority RULED ON 20 June 2012 against a Golgate TV Commercial. The television commercial depicted a nurse visiting her dentist. In the TV ad, she said the dentist showed her the bacteria in her mouth and recommended that she use the product. She then proclaims that the bacteria are practically gone. The complaint was against the implied (hidden) message that health professionals endorse the product. The advertiser, mindful that consumers might complain about this, added disclaimers as text on the screen reminding the viewer that it represented a nurse and that it was a creative expression. The advertiser hoped that the consumer would see it as fictitious and not as endorsed by the nursing profession. The ASA however, said that the actress was in uniform, claimed that she was a nurse and the ad was set in a clinical environment. They stated "We considered that, in the context of an ad in which antibacterial claims were made, and in conjunction with someone who appeared to be a healthcare professional, viewers were likely to infer that the product was endorsed by members of that profession. We acknowledged the ad included on-screen text during the first scene that stated 'Representation of a nurse' but did not consider that this took away from the overall impression that the product was endorsed by members of the nursing profession and therefore concluded that the ad was misleading." In essence, the visual imagery was likely to mislead.

There are several interrelated principles established by this ruling:

- Disclaimers are not acceptable to negate the main theme and message of an advertisement.
- Verbal text (and text in print ads) that could infer something else, is misleading.
- Inferring endorsement, without substantiation, is no different than claiming product efficacy without substantiation.
- Hidden messages, even by inference, are misleading if claims are not substantiated.

Whilst it is true that SA is not regulated by the UK's code, their rulings, and the reasons for their rulings can guide us how to apply and interpret similar SA codes.

We are not aware of complaints in SA against unsubstantiated or implied visual claims. Scholarly work on how consumers interpret hidden and exaggerated visual claims, are limited. This makes the task of complaining about misleading visuals more difficult. Some advertisers display exaggerated product benefits with visuals but do not explicitly claim these benefits with words. This allows them to escape censure and mislead consumers. An argument that they can use is that the implied exaggerated benefit does not exist and that the visuals are but an artistic expression of the product benefits. Some may even argue that it is a form of visual puffery and that consumers will understand that the visual claims are there to illustrate the product benefits and that they do not claim that it will apply to consumers.

✓

We need to know if the reasonable consumer is able see through the visual exaggeration or is he or she actually interprets the exaggeration and puffery as the meaning of the message.

The typical questions that we need answered are as follows:

- How do consumers interpret a typical advertisement where visuals portray and imply exaggerated benefits of the product?
- Do consumers understand the net message of an advertisement as portrayed by images, excluding the text?
- Are visuals strong enough to communicate a message even if the text is missing or when consumers do not read the text?

Project requirement:

Step 1 (week 1)

Get together into a small group of 10 persons. Discuss the following:

- 1) Review the eight images.
 - a. What is the net message of the advertisement?
 - b. What do the visuals claim?
 - c. What do the visuals imply?
 - d. Are there exaggerated claims?
 - e. Do they comply with the SA Code of advertising practise?
- 2) How can we rephrase the problem?
- 3) How can we best answer the bulleted questions above?
 - a. Can we restructure those questions?
 - b. How can we state the three questions in one paragraph so that a student will understand the question?
- 4) What process will I follow to extract information from a reasonable consumer in terms of the questions?
- 5) How will we structure the report, and who will do what and when?
- 6) Who will report on the effort input by individual members?
- 7) Who will chair the small committee?

- 8) **How will we go about post-testing the 8 examples with a sample of normal consumers?**

Step 2 (week 2)

Summarise and allow the chair to present in 8 minutes the outcome of your deliberations in week 1.

Focus on the following:

- Example of the final questions
- Sample size and sampling
- Where and how of post-testing
- Procedure of post-testing
- Example of post-testing questionnaire document
 - Information to subjects
- **How will we go about post-testing the 8 examples with a sample of normal consumers?**

✓

Step 3 (week 3)

Respond to the critique in week 2, restructure the questionnaire and process, and conduct the post-test. Present only the results.

Step 4 (week 4)

Respond to the critique, draft the final report, and present it at the next class round robin.

Report requirements

Compile the report as per the study guide requirements. Indicate the chair, the members, and the portfolio of each member. The Chair must indicate the % penalty for each person that did not make a contribution that matched those of other group members.

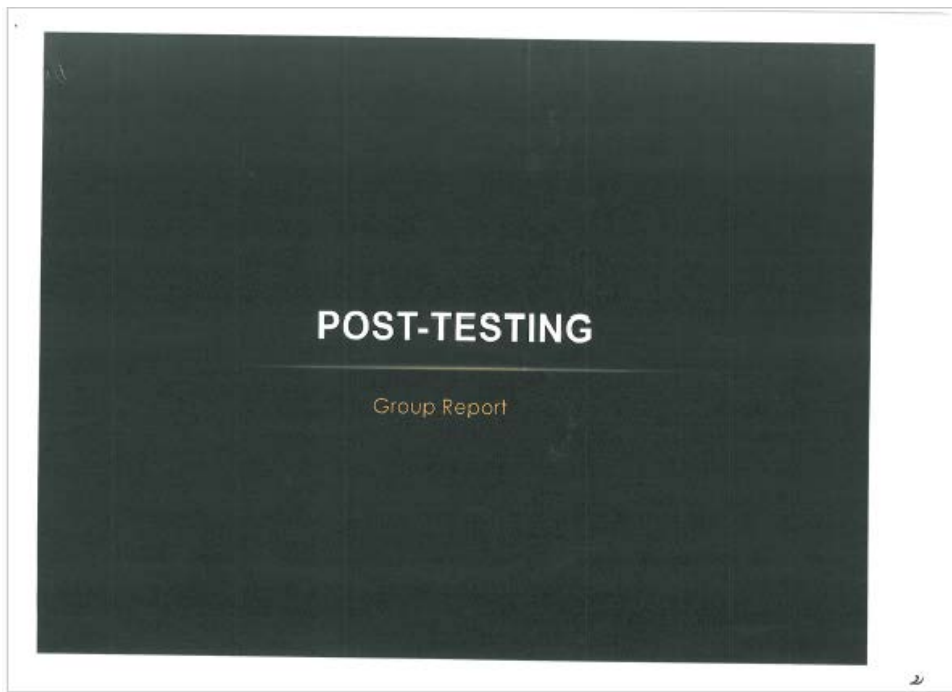
The report must include the aim of the project, the method, and the results in qualitative and quantitative format as well as a conclusion.

Assessment	What will we assess	Completion date	Weight
Report on post-testing eight commercials	Completeness, quality, accuracy	14 August	6

Item	Max Mark	No attempt	Attempt	Meet	Exceeds	Exceptional
Technical requirements of the report	4					
Presentations (Mark allocation by group chairs)	16					
Content and quality of the report	16					
Bibliography and referencing in the text (at least 4 sources).	8					
Addendum, advertisements used	4					
Total	40					

--oo0oo--

✓



THE PROCESS THAT THE GROUP WILL FOLLOW TO ANSWER THE RESEARCH QUESTIONS

TARGET MARKET

- Students from Arts Campus (easy access and more visually literate)
- Each member will also approach members of their community

HOW MANY SUBJECTS WILL EACH PERSON QUESTION

- Each group member will question seven people from campus and three people from their specific community, so in total the whole group will question 80 individuals.
- We are going to conduct the interviews/ group sessions on campus, targeting more relaxed locations like the cafeteria (where people can relax and be willing to participate in the group sessions).



3

- Each member will conduct their own group sessions where they will ask the participants questions and record the answers using their mobile phones and later filling in the questionnaire (easier and not time consuming).



EXAMPLES OF QUESTIONS COMPILED FOR THE QUESTIONNAIRE

- What attracts you to the ad?
- Do the visuals/ images on the ads communicate a specific message to you?
- Do you think the message is exaggerated or realistic? Why?
- What would you change to have this ads communicate better than it does? Why?
- Have you been convinced by the images/ visuals to buy a certain product being advertised?

4

The report (Interpreting visuals in advertising) will be drafted by

- Andrew Muleba
- Nokwanda Mamba
- Moshe Ngoasheng
- Odirile Mathibe

CONTRIBUTION OF MEMBERS

- Each group member compiled five questions for the questionnaire.
- The whole group discussed the approach we are going to take for the project.
- Koketso Moganetsi, Andrew Muleba compiled the PowerPoint presentation.
- Bongani Xaba will do the presentation.

2

Information leaflet

The net message communicated by visuals in printed advertisements

Tshwane University of Technology, Department of Visual Communication
Prof RW de Lange, delange.rw@tut.ac.za, tel: 012 3286165

Dear Participant

The aim of this research project is to obtain information about the net message of visuals in print advertisements. The term **net message** refers to the message conveyed by the visuals when we factor the headline and body text. A consumer's interpretation of the visuals provides the "net message".

Advertisers normally use text and visuals to sell their product. Most text/visual elements in advertisements are congruent and communicate the same message. Consumer (viewer) messages about the (visual) elements, however, often differ from the visual. Advertisers must be able to select and combine elements to make with the ad. They have to include the consumer's wish (text or visual). There is, however, their ability to integrate with visual and may be in the (they cannot) visual world. The reason for this is that it is very difficult to challenge the implied message in a visual (the stated plain text) equals an misleading if the advertiser cannot substantiate the implied claim.

We can test a hypothesis that visuals in an advertisement are misleading or not. If we collect data about consumers' interpretation of an ad's net message. The aim of this research is to investigate the net message of the visual and to determine consumers' interpretation of the visual. The results of the survey will point towards the C/P (made by the visuals) in the advertisement.

Your comments will enable us to indicate whether claims are misleading and if the net message is congruent with the ad and headline.

What are you required to do?

We will appreciate if you could voluntarily participate in the survey. We need your interpretation, expressed as a percentage of the number as implied by the visual of 30 advertisements.

We will also appreciate information on such as your home language, age and gender. This will help us to interpret the results. Your privacy will be protected and the survey will be anonymous.

You may choose not to participate, as a researcher (and, in this case) survey without penalty, if you choose to do so, please indicate this by stating your withdrawal as the survey answer sheet. We will not include your name in a research paper.

Kind regards,
K. Moganetsi (Chairperson)
A.N. Mamba (Deputy Chairperson)

2



Xolisile Wellem

Chairman

3



Name of group members

- Xolisile Wellem (chairman)
- Gene Saunders
- Mthokozisi Gumbi
- Nadine Nortje
- Helio Hansi
- Glen Modiba
- Tshepo Pete
- PL Sikwayo
- Carolien Louw

3

Sample size and sampling process

- SPECIFICATIONS FOR SAMPLING
- 6 to 10 people (six being the minimum maximum 10)= $9 \times 6 = 54$, $9 \times 10 = 90$
- That gives us a minimum of 54 people and 90 people maximum

3

Specifications for sampling

- Questionnaire
- Yes and No questions
- Research consultant writes down answers
- Or ticks the appropriate box.

Course	Institution	Age	Gender
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3

STEP No.1

Week 1

3

1.Rephrase the questions given

a. *What is the net message of the advertisement?*

What message are you getting from this advertisement?

b. *What do the visuals claim?*

What do you think the images are suggesting?

c. *What do the visuals imply?*

What do you think the images are trying say?

d. *Are there exaggerated claims?*

Do you think the advert may contain unproven content?

4

2. Methods of Obtaining Answers

1. Direct Interaction Method

Approach individuals of target group randomly for their views and interpretations of the visuals, on the streets and campus

2. Social Media - Facebook

An image will be posted on the dedicated page for review by "friends" with whom we interact with.

3. Social Media - BBM / WhatsApp

A group chat with the contacts we have that will discuss and review the images as posted (WhatsApp) and made profile pictures (BBM)

4. E-mail

An e-mail correspondence group interaction that would give feedback of the images attached

3

3. Report Structure

1. Title Page

Your names and group number and whom the report is prepared for, submission dates and course of study

2. Acknowledgements

People who have helped in making the report a success

3. Contents Page

List of all the sections and sub-sections contained in the report labeled in numeric order

4. Terms of Reference

The purpose of the report and its definition, including task allocation of our members as well what we aim to achieve from it.

5. Procedure

How we will go about in gathering the information needed for the compilation of the report

6. Summary

A synopsis of the report so as to give the reader or whom the report is intended for an idea of what the report is about

3

POST-TESTING

a Presentation

Group 1



4

Chairperson

- ME!
-Janneman Erasmus
- Report input done by group members



4

My Team

- Carlo Du Preez
- Rozanne Jacobsz
- Stephanie van der Merwe
- Adél Van der Watt
- Roxette Prinsloo
- Gené Engelbrecht
- Carla Fourie
- Leandri Horn
- Charne Opperman
- Sonja Truter
- Jani Van Sittert



4

Our Sampling Process

Step 1 (The survey)

- Create survey and answer sheet
 - Age
 - Gender
 - Home Language
 - Department



4

Step 2 (The Final Approach)

- Approach students on campus between the ages of 20 – 25
- Approach a equal amount of students. 1 Male + 1 Female = Equal number
- Every member will approach atleast 2 students
- $12 * 2 = 24$
- We want to approach different students from different departments and study courses



4

Age _____ Gender _____
Home Language _____ Course Department _____

advertisement one
Visual message _____
Are the claims exaggerated YES NO

advertisement two
Visual message _____
Are the claims exaggerated YES NO

advertisement three
Visual message _____
Are the claims exaggerated YES NO

advertisement four
Visual message _____
Are the claims exaggerated YES NO

advertisement five
Visual message _____
Are the claims exaggerated YES NO

advertisement six
Visual message _____
Are the claims exaggerated YES NO

advertisement seven
Visual message _____
Are the claims exaggerated YES NO

advertisement eight
Visual message _____
Are the claims exaggerated YES NO

advertisement nine
Visual message _____
Are the claims exaggerated YES NO

advertisement ten
Visual message _____
Are the claims exaggerated YES NO

4

Step 3 (The Structure)

- Pie Charts and statistics



4

Who Does What?

- Everyone does their own survey
- Statistics
 - Roxy, Rozanne, Janneman
- Report
 - Jani, Gené, Carlo, Adél
- Charts
 - Carla, Sonja, Stephanie, Leandri, Charne



4

Post Testing Research

How subjects interpret
the net message of the
visuals.

1



Chairperson

- Innocentia Mthethwa.
- 3rd year Visual Communication student majoring in Multimedia.
- Studying at the Tshwane University of Technology.

1



Group members

- Ayanda Jiya
- Bathile Sono
- Bridget Phahla
- Jabulile Mkhonza
- Lehlohonolo Mokotedi
- Lesego Kgosimang
- Mfundo Gumede
- Prncess Sithulo
- Thembetihle Sikhosana
- Tsepho
- Tumelo Poee

1



Introduction

What is advertising?

- The art of praising your own goods and services publicly with the aim to encourage people to buy or use them. (*Oxford South Africa*)

1



So how do we make sure that the advert fulfils its mandate?

- Pre and Post testing.



Pre Testing...

- Allows us to gain a gist of how consumers interpret a message before it is released into the market.

1



Post Testing... What is it?

- The process that allows us to identify and establish where we went wrong concerning an advertisement.

1



Our approach

- Draft a suitable questionnaire for our research.
- Divide the tasks equally to all team members according.



The sample size and sampling process

- Each member will interview :
 - 3 types of people and 2 of each
 - Working class
 - Student
 - Child (age 7-12) / teenager (13 - 18)
 - Each member in total will interview 6 people.
 - Total size of the sample $12 \times 6 = 72$

The questionnaire

Post Testing Questionnaire : How do subjects interpret the net message of the visuals.

Please answer the following questions as best and honestly as you can.

Age : _____ Gender : _____ Category : _____

1. Briefly interpret the visuals in the provided adverts in your own understanding?

1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____

Answer the following questions under a general consideration of all the provided adverts.

2. What constitutes a good or bad advert?

3. Do the ads create desire? State which do and which do not.

4. Does each advert relate to the brand? State which one does and which one does not.

5. Does the feeling you have for the brand translate to the way you engaged with the product?

6. Do you feel that the advertisements are successful in their mission to persuade?

7. Are there any claims that are misleading? Please specify.

8. Are the messages portrayed in the advert visuals easy to understand?

9. Are the claims made in the adverts realistic enough to reach the average consumer?

10. How critical is text in an advert and what disadvantage does it impose on the ad if it is absent?

1

Plan of action

- The form is designed such that it takes 10mins max to complete.
- The subject will be given the option to fill in the form with or without the assistance of a team member, for connivance's sake.

1

Sampling areas

- Menlyn Mall
- Brooklyn Mall
- Sunnyside
- Arts Campus
- Mamelodi
- Bronklespruit
- Danville
- Ferie Glen

Branding...

- The team will be divided into 6 pairs.
- Each pair will conduct their field work in any self chosen area.
- Each team will be branded with the black TUT arts department t/shirt as a depiction of the origin of the research for clarity's sake.



Compiling the report

- Each team member will analyze the findings of all the information they collected.
- The whole team will hold a compare and contrast meeting to form one research document.
- Every team member will contribute equally and the report will be drafted by : Mfundo Gumede, Bridget Phahla, and Lehlohonolo Mokotedi.
- Will be proof edited by : Innocentia Mthethwa
- Will be presented by Batile Somo and Tumi Poee

Assessment of the Problem Based Learning Approach

Pre- and post-testing learning unit

Dear student

Based on the previous 4 weeks class activity, kindly complete the following:

1) I rate my involvement as: (mark one of the following)

Minimal poor average more than average outstanding

2) I experienced the class activity and this method of learning as:

Very poor poor average good excellent

3) If given the choice, I would prefer this format of learning for this subject

Yes No Not sure

4) Rate you increase in knowledge and your ability to apply this knowledge on a scale from very poor to very good.

Very poor poor average good excellent

Write one comment to reflect your honest opinion about the last 4 weeks

The last project 4 weeks of this project have been a good experience

getting different response

.....
.....

Codes-quotations list**Code-Filter: All**

HU: Final Tladi July
File: [C:\Users\nathi\Final Tladi July.hpr7]
Edited by: Super
Date/Time: 2018-07-27 14:01:43

Code: 21st century students learning skills {1-0}**P 3: Lecturer.rtf – 3:9 [In other words, maybe the stud..] (30:30) (Super)**

Codes: [21st century students learning skills] [Student feedback]

No memos

In other words, maybe the students should as a class, come up with ideas and tell us how they would like to be taught. Because I think they've got a pretty good idea of what's going on outside there in the world. They know a hell of a lot more I think than we think, you know, and maybe they've got some good ideas on how they should be taught, and maybe they must be let us know how should this thing work. And I say now there's another problem. Because of the background... because of the composition of the classes, and the different background you get the guys that are, that would like the problem-based teaching, and then the guys that would like to have the sort of conventional teaching, where they are told what to do. I can tell you right now, you know, that percentage is probably going to be maybe 50:50, or maybe 60 for the problem-based teaching, and the rest maybe for the guys who would actually would like to know...to say it quite straight, this the poorest students, the students who have not almost been like exposed as much as the lot of the students, they have not been exposed to the sort of things, so they need a lot of help, and I think those students are going to be, to want to be taught in a conventional way, I can tell you right now. Am convinced that there is going to be a percentage like this of two groups that one would like this and that would like that. To me that's almost like how do you solve that sort of thing?

Code: Blended learning {1-0}**P 2: Industry expert.rtf – 2:4 [What I wanted to say basically..] (13:14) (Super)**

Codes: [Blended learning]

No memos

What I wanted to say basically is that there is goggle. You can know you can get anything

by just goggling it. Whether you are a designer or a doctor or whatever you are you know. So it is not as if students don't have access to all the knowledge that there is, I think that it is not something to be scared of, this problem-based thing, is not something to be scared of, but I think that students tend to be taught from, Pre-school, they tend to be taught that this is the teacher, and the teacher teaches. So you are getting people that gets into this point where we are now, that's being, that's been trained in a specific way, the way of working and I think you almost need to unlock that as well. That's almost like an intermediate stage when you unlock and say listen, because: if you come to me, and I'm a student now, now we have to do this new way of doing I will immediately say no I do not like it. I'm not going to say I like it, and I think that you have to bridge that by making sure that you just turn the key first before you get into it because in actual fact, I think it is far easier to do it this way. I think there is more stress on the lecturer because he does not have a goggle in his head all the time. So these people are going to do research and get a lot of information, and they are going to come to him and say what must I do here and what must I do here. If you are talking about groups, if you have six groups in the class, and each one of the six groups will come up with other challenge, and that's what is good because it's problem-based learning.

So now the problem is, I'm thinking of the poor lecturer as well...and then the bridge between the institution and the world out there. You know, I always say to students when they apply, you know what we expect from you, is to come and teach us. You've just been taught the latest, you've been involved in the latest and we a company that is dealing with what is going at the moment, we expect from a student that has just finished his course to come and tell us what we should do. And they think the opposite way, they think I need to come and work for you so that I can get experience. Now if you do it in a problem-based way that is almost as if you bridging a bit of that problem of experience. Because we have already solved the problem, I can immediately give you a problem to solve.

Code: Communication {1-0}

P 1: Head of dept.rtf – 1:3 [And that means I must move awa..] (10:10) (Super)

Codes: [Communication]

No memos

And that means I must move away from a lecture classroom, to a room where a person

can walk around, work with smaller groups, and the facilitator: who will be the facilitator?

Code: Education system {3-0}

P 2: Industry expert.rtf – 2:14 [I think a system like this, is..] (46:46) (Super)

Codes: [Education system]

No memos

I think a system like this, is not something like you can take 3rd years and then say, now from 3rd year we are going to do this. You take first years and say this is like this. This is like an education system, it should actually go back to Pre-school, that's where it needs to start, because by the time I get to 1st year, and then I would be able to tell you what I prefer and what I do not prefer. I don't think they are in a position to do that....

P 3: Lecturer.rtf – 3:10 [But that is the dilemma of the..] (32:32) (Super)

Codes: [Education system]

No memos

But that is the dilemma of the education system, it's actually, it's as if it must be taken right back, it must be sorted right at the beginning. I don't know if this makes sense or not.

P 3: Lecturer.rtf – 3:12 [That's what am saying, there's..] (39:40) (Super)

Codes: [Education system] [Problem-based learning]

No memos

That's what am saying, there's a good percentage of students that are going to struggle a lot...

But again, I understand what you are saying...

Code: Facilitator {1-0}

P 2: Industry expert.rtf – 2:8 [This is what the art thing is ..] (29:29) (Super)

Codes: [Facilitator]

No memos

This is what the art thing is all about, it's to change talent, and people have got talents, to mould the talent into the practical approach, to get you to use your talents. And I think if the lecturer becomes the facilitator, that's actually what he facilitates. He must see that this guy is good at that, and he can handle this sort of thing very well. So I must help him and force into a situation where he gets to develop that because that ...anyway

when you get to the industry you get to the right plane, you going to immediately go in there, and they are going to love you because you are doing what they want you to do. And I think what you have to tell us is: yes we think with what we have at the moment we will be able to do that, or you will be able to say no, I think we need more of this practise in this, practicing the challenging thing, you know, I think that's what it comes down to.

Code: General knowledge {1-0}

P 3: Lecturer.rtf – 3:2 [: Talking about general knowle..] (6:6) (Super)

Codes: [General knowledge]

No memos

: Talking about general knowledge...students must concentrate on variety of aspects... General knowledge, they must submit a lot...they must know all sorts of things

Code: Group work_Mark allocation {2-0}

P 2: Industry expert.rtf – 2:19 [Everybody should realise that,..] (60:60) (Super)

Codes: [Group work_Mark allocation]

No memos

Everybody should realise that, you know, if you can't get 80% for everything you do, then you are not in it. You do not even have to get marks, if you do not get 80% you are not going to get it, you won't get there. The only one that will get it is the one that has got 80% as the background, then we do what we do. And then you know, her little piece of difference between getting it and not getting it, and I think you should not even feel bad, you should learn to cope with it because that is what is going to happen to you. You are going to win some and going to lose some. But the losing player is also got 80%, it's not like is as if is only the winning player who has 80%, it's just that there is a lot of other emotions getting involved now in this decision. And because of that, you might lose the pitch, but it is not to say the pitch was not good enough. And I think that with marks we tend to think,... I was like that at school, you know these people always worked hard at school, if I can just pass, am happy, I do not care how good I do, I just want to pass

P 5: Student 2.rtf – 5:3 [Because to an extent that if y..] (7:9) (Super)

Codes: [Group work_Mark allocation]

No memos

Because to an extent that if you get a project, and you know it's not for marks, then you say, let me rather focus on the stuff that I know is going to count, as opposed to stuff that

I know is not going to count. Because you feel like it's a waste of time where you could have put in more effort on stuff that you know you are going to get marks on.

And how are you going to get these different topics?

Well I guess it's the variety of the content you are covering. So, say for example you gave us **content analysis**, for example, and you say we must do research there. And then maybe a certain group focuses on **thematic content analysis**, and another group **focuses on frequencies** and then within that whole broad topic, you've actually covered segments of different topics, but then within the same thing and then, say maybe by the end of the class, you've covered maybe six sub-segments of one big topic that maybe could have taken you something like three weeks to cover in total.

Code: Group learning_group work {1-0}

P 2: Industry expert.rtf – 2:13 [Listen, do you know what the b..] (43:43) (Super)

Codes: [Group learning_group work]

No memos

Listen, do you know what the big thing is that the students don't take this too seriously. If you tell them, guy, you must work as a group, because pushing your own weights is not going to bring you any new ideas, and you don't solve this thing. And you know, you see this, you guys must correct me...they don't take these things too seriously...I think it's just the make-up of the way it works. They don't see it seriously enough. Maybe they will do now in third year, I don't know, but in the first year you don't take it seriously. At least I've seen most of the students don't take it seriously, and they just want to get this thing done

Code: Group learning_grouping {1-0}

P 2: Industry expert.rtf – 2:12 [That's in a way a bit of a for..] (41:41) (Super)

Codes: [Group learning_grouping]

No memos

That's in a way a bit of a forced grouping... if there are challenges out there, and am in the company, and I'm the facilitator there, I see then ok, in this case I think Rene and Elshas are the people that will do this the best, then I will tell them you solve the problem. And am not saying you alone, but you all must solve the problem. And then they do it. You are also going to have a facilitator in the end, but people won't be able to pinpoint and say ok this guy is coming up with certain things that if we put this in combination, it will work.

Code: Group learning_partnership {2-0}

P 2: Industry expert.rtf – 2:9 [Maybe you see another... you s..] (31:31) (Super)

Codes: [Group learning_partnership]

No memos

Maybe you see another... you see I also do not want to talk too much. I think one of the problems that we have on the inside is that, in practice, what happens a lot is partnerships of two or three. You don't do many jobs on your own. A lot of success lies within a situation where you've got two designers working together. The one has got certain traits, and the one has got others

P 2: Industry expert.rtf – 2:11 [I've got a close experience wi..] (38:38) (Super)

Codes: [Group learning_partnership]

No memos

I've got a close experience with my daughter...is also in the industry, she's got a partner as well, and they work together, and they now having an art exhibition this week. Which is now like extra-mural art exhibition, where even the art that they do, they do it together. It is not even one person's exhibition, it is a dual exhibition.... and the work that they prepare/ present is done by two people and not done by one. So it is very important for us to realise that the problem that the lecturers and the people that's doing facilitating, the problems that they have in this situation, because you have to actually realise that this is the people that will work together rather than on his own, and allow that because you are talking about problem-based. If the problem gets solved by three people together better than one then you have to do it.

Code: Group learning_personalities {1-0}

P 2: Industry expert.rtf – 2:10 [The one has got certain type o..] (35:35) (Super)

Codes: [Group learning_personalities]

No memos

The one has got certain type of personality, the one has got another type of personality, put the two together, and you've got fantastic solutions. Each one on their own, if you say, because you said you have to do it alone, do it all by yourself, each one of those would not succeed alone. But when they are together, on a team, they do it. The guy in South Africa, Mr Frans de Villiers received the most accolades; he's actually got even medal from the Science and Art Council. He is the first guy ever from the advertising industry to get that. He has never worked alone. /EISH! It's one of his creations, but it was not created by him alone, he's got a partner, a small guy, this is a very big guy. He's got a partner, I know them, and the small guy is the one that ignites and the big

guy is the one that comes with the story. The small one does not feel secure enough to do it, but the big one will do it. So it's, in their case, this one won it because he is the big guy and, but actually they should get it together cause it's always the team that did it. And what's interesting is: they started in Jo'burg at a agency, they were head-hunted and they went to the next agency, they still together, and they are now in Cape Town. They've right through to Cape Town, they are still together. They get head-hunted as a group, and they don't have the confidence in not working in a group. Now

Code: Industry-expectations {2-0}

P 2: Industry expert.rtf – 2:6 [Would you feel almost, sort of..] (19:21) (Super)

Codes: [Industry-expectations]

No memos

Would you feel almost, sort of sure of yourself?

Would you feel competent enough if you were given a problem tomorrow? Listen, this is what you must do....

I think what is difficult is like as I said in the beginning, you must realise that you guys, when you start, you don't start and go and do everything. You are not running a company, you are running a campaign, and maybe you are going to be involved only in a certain part of the campaign. When there is an art director will tell you what he wants... this is the part of the problem that you must solve, it's not like this whole challenge is now yours, solve it you know,

P 2: Industry expert.rtf – 2:15 [Look, I think of I take your p..] (48:48) (Super)

Codes: [Industry-expectations]

No memos

Look, I think of I take your project that you talking about, you know, a designer is not going to really get involved in research. It's never done. You get a researcher to do research, a designer interprets the research together with the team, i.e., You know a guy that's very much into that kind of thing, but, if the designer does not know anything about research, and about what research is all about, they are not open to that, they don't know how to ...adding some value. They can only add value if they know how it works. That's why it's important for them to know that.

Code: Industry-ready {1-0}

P 1: Head of dept.rtf – 1:4 [Let me come in here, that is w..] (13:13) (Super)

Codes: [Industry-ready]

No memos

Let me come in here, that is where I sitsorry because, ehh, the facilitator, but the next quarter must get their students, and make them industry-ready, in terms of the one little module that is pre- and post- testing. Now, I exaggerated a bit, but my easier term last year wasn't really like that, it was talk and chalk. When I stand in front and tell what you read and tell you to write an essay...then they do it for me, then I mark the essay and then their marks...and it's not really like that....I assume that you must tell me, and I must hear from everybody else the work that must do ...you guys are ready for ... is that right? And you can check how it's done, and put in as well that eventually thislet heareach one is happy with you... and then when I report to my head of department, or my divisional head he says: mhh...nice done...students are better prepared than last year. So I assume now that I've got to get input from ...because I've got three weeks to get myself orientated, because when we get back the next quarter, that's when I've got to implement this particular module.

Code: Industry-skills {1-0}

P 3: Lecturer.rtf – 3:6 [Because that's the sort of peo..] (19:20) (Super)

Codes: [Industry-skills]

No memos

Because that's the sort of people that they need out there... ok, look, different people they need lots of different people.... I think the top people are going to be the people that can really think for themselves, and solve problems, and still want to call it problems, I'm used to tell you guys this is all about problem-solving, each thing has got its problems, and design is about problem-solving.

After the 3rd year or 4th year, do you think you guys will be up to the challenge? That basically what this is asking you?

Code: Motivation {1-0}

P 1: Head of dept.rtf – 1:6 [Could I as a non-industry, and..] (20:20) (Super)

Codes: [Motivation]

No memos

Could I as a non-industry, and a non student person make a comment? Is that the concept you made make ...I mean from your side it makes sense, which means after we do something which is going to be motivational for students, we could also have the age

gap and we've got a bit of an industry gap, and what industry will find useful. So, yes, maybe from my chair, sitting as an administrative office with comments ...as we work together, but then I need critical comments from the industry as well... to say we come up with a proposal, I have to do that within the next three weeks we ...you, me, us, propose to tackle the first lesson, or the first contact session....now we get a feedback and see well...it is not going to work for me, ...from your side as well. Then that will be helpful. At least when I walk in to the class next week, I'm prepared, because whatever I've got to, of the worksheets and whatever, we can do that in the next two or three weeks, before the end of June or the first week of July. So you are going to take this...

Code: Outcomes based approach {2-0}

P 2: Industry expert.rtf – 2:17 [You have to start somewhere an..] (55:56) (Super)

Codes: [Outcomes based approach]

No memos

You have to start somewhere and hopefully if we prove that in a small way it works, it can, and the more it gets extended, the better it would be.

I think, as you said in the beginning, there's a lot of similarities between outcomes-based approach and this. And it's not so different; it is just that maybe being doing it by yourself part is stronger ...because of the industry...

P 2: Industry expert.rtf – 2:18 [I think I'd just like to say s..] (57:57) (Super)

Codes: [Outcomes based approach]

No memos

I think I'd just like to say something about the marks that you mentioned. The fact that you doing things for marks and in the end you need to really work because of that, that's the outcome you are looking for. In the industry there is no marks, you either get the job or you not get the job. It's a very black and white thing, you pitch for something, you do everything as good as you can and it's the best if you give it, but you still don't get it, you know, you still don't get the job.

Code: Problem-based learning {6-0}

P 2: Industry expert.rtf – 2:16 [So in the case like that, I st..] (50:50) (Super)

Codes: [Problem-based learning]

No memos

So in the case like that, I still think that the problem-based approach would be better, because there is the problem, solve it with research, you know. It would still work in the

long run if you put this together, it would still work better than telling him this is how research work. You know I was a student, we use to do that, he drums it to you and it runs to the other side, you never know. I mean we had classes in marketing, then the professor from Unisa (Wyers) then he does like 3 or 4 classes just on the theoretical side of the marketing, very interesting. You know it's entertaining, it's a bit of entertainment and it's over. After that, you know nothing of marketing, you know. If I had goggled, and I could goggle marketing, then I could go and study, and go where I'm interested, follow what I see, that I would be far more educated than what he told us.

P 2: Industry expert.rtf – 2:20 [Now I know it's the opposite, ..] (62:62) (Super)

Codes: [Problem-based learning]

No memos

Now I know it's the opposite, you have to know, you must get 101% in everything, and otherwise the competition is just too stiff, otherwise you are not going to make it. And today, there a lot of guys that is qualifying in your field. So there is a challenge out there, just getting a proper job and getting acknowledgement, and getting the opportunity to solve a problem is a big one already.

P 2: Industry expert.rtf – 2:21 [I can just suggest that, one, ..] (64:64) (Super)

Codes: [Problem-based learning]

No memos

I can just suggest that, one, with this sort of thing, I do not think we must try and solve or you must try and solve the big problem. I think you must rather start with something simple, and test the idea, rather than trying to do something, and make it so complicated that it is almost you are not able to judge whether it is working or not. I think you must do that, very simple, take now a very small step, you can take bigger steps later. But I think you should do something that is very achievable, in a way almost easy, not make it too complicated because I think you can shot yourself in the foot..

P 3: Lecturer.rtf – 3:3 [Khosana can I tell you last ye..] (9:9) (Super)

Codes: [Problem-based learning] [Problem-based learning_practicals]

No memos

Khosana can I tell you last year I spoke to a couple of guys in the industry, theatre directors. From three studios/agencies ... and one of the things that came on top of their heads....what we really wanted is thinking designers, people that can solve problems. Typically, if I've given you a campaign, here's the whole campaign, you must go and see what the clients wants for that campaign; they must not be told what to do, they must think the whole thing out, problem-solving thing is good practice, problem-based is good practice. For the people that live here, or practice in thinking the problems out already, like if I presented this, look at this thing here, what is the problem with this, the client needs that. What does the client need to advertise this problem; in other words they must be thinking designers, not just do this and they do that; they must know why they are doing it; they must be able to solve problems.

P 3: Lecturer.rtf – 3:11 [It's like everything Wessels, ..] (37:37) (Super)

Codes: [Problem-based learning]

No memos

It's like everything Wessels, if you force yourself to do a thing, if you are forced to fix this engine yourself, go and fix it, you will learn a hell of a lot, if you do it yourself, you do problem-solving, and you remember....

P 3: Lecturer.rtf – 3:12 [That's what am saying, there's..] (39:40) (Super)

Codes: [Education system] [Problem-based learning]

No memos

That's what am saying, there's a good percentage of students that are going to struggle a lot...

But again, I understand what you are saying...

Code: Problem-based learning_challenge {3-0}

P 2: Industry expert.rtf – 2:5 [I think the term 'problem' is ..] (17:18) (Super)

Codes: [Problem-based learning_challenge]

No memos

I think the term 'problem' is a problem.... It is actually a challenge not problem....

When you say something is a problem, then people think it is a problem. But, if you say it's a challenge, because, if I give you a job, I'll say this is the challenge, this is what we need to solve, get a way out for this challenge; then it's a different approach, a different way of looking at it. Am just mentioning that, because I think what you are saying. And as I'm say again, we expect from the qualified student to come to us and to give us something. We do not expect to give them something. And that's why, when they come to us, they sit there and want to eat from the XXX....and they don't get paid very well. If they come there and they give me solutions from day one, they get paid very quickly and they grow very fast. And that's just another way of looking at it..

P 3: Lecturer.rtf – 3:5 [In other words would you be wo..] (17:17) (Super)

Codes: [Problem-based learning_challenge]

No memos

In other words would you be would you be able to meet the challenge? After you leave 3rd or 4th year, you go and work for design studio or agency or whatever, do you think you'll be up to the challenge? If the guy comes here and say, listen: here this client wants you to design a campaign; this is a problem or challenge or a campaign; do you

think you can do it? Have you got the background to be able to do all the thinking you can do all the thinking work that it takes to design this campaign for example?

P 5: Student 2.rtf – 5:4 [Yes I think it does, because a..] (12:12) (Super)

Codes: [Problem-based learning_challenge] [Students' challenges]

No memos

Yes I think it does, because another thing that, another problem or challenge that we faced with, we find that some of the students are not very comfortable in presenting or putting their ideas. You find that they've got very good ideas, but when it comes to presenting them they are not very keen on presenting them. But the more we cover we motivate them and encourage them to do certain presentations and so they become more confident, and speaking towards certain people and then by the time they get to the industry they've already got that confidence that Mr Wessels was talking about, of being confident in whatever that you are going to present even though it might not be the best idea but the fact that you have the courage to actually speak to somebody about it and try and convince them that it should be the way that it should be done, I think it works

Code: Problem-based learning_competent {1-0}

P 5: Student 2.rtf – 5:1 [I also agree, I think that it'..] (2:2) (Super)

Codes: [Problem-based learning_competent]

No memos

I also agree, I think that it's going to actually encourage students to want to learn more. Because at the moment I also feel that to a certain extent, we are sort of spoon-fed, with the lot of stuff...at the moment you get to 3rd year, that's when you actually start realising that, oh no!, we need to start doing work ourselves, and that's when we start realising that we've been spoon-fed all this time, and you...so I think it's going to push us to want to learn more, and obviously we are going to be more competitive and more competent in the work place ...so I think it could work.

Code: Problem-based learning_definition {1-0}

P 3: Lecturer.rtf – 3:1 [At the moment we use outcomes-..] (2:3) (Super)

Codes: [Problem-based learning_definition]

No memos

At the moment we use outcomes-based learning. What is actually problem-based learning? I do not really know what it is. I just need to understand it better.

What is the difference between problem-based and outcomes-based?

Code: Problem-based learning_experiment {2-0}

P 1: Head of dept.rtf – 1:7 [At this point in time we are f..] (22:23) (Super)

Codes: [Problem-based learning_experiment]

No memos

At this point in time we are focusing on a portion of one subject.

Can I just make a comment? To a certain extent, I believe that many of your practical subjects have got elements of problem-based learning, because it's project-based. Roger you might not know about this, for theoretical subjects, it is outcomes-based, but we can use the problem-based approach in research or training of the skills in this particular knowledge management subject.

P 3: Lecturer.rtf – 3:7 [We give the students projects ..] (24:24) (Super)

Codes: [Problem-based learning_experiment] [Problem-based learning_practicals]

No memos

We give the students projects like, at least one project where they get a project as a group,... it's like groups of three or four, and they have to perform this project together. It is to experience a bit of this working together and solving problems together. But I must say the students don't really like it. They don't like it, because I always get the problem, I see it with Jason today. You get three guys working on a project, and only one or two are pushing or pulling their weight and the rest are just, ehh, you do

Code: Problem-based learning_improvement {1-0}

P 4: Student 1.rtf – 4:1 [I'd like to think so, and the ..] (2:2) (Super)

Codes: [Problem-based learning_improvement]

No memos

I'd like to think so, and the implementing the problem-based education would in a way improve that; with regards to the fact that, as Mr Wessels mentioned they'd rather have someone who is prepared to take the challenge and meet that challenge and come with results on how they have dealt with the challenge

Code: Problem-based learning_practicals {5-0}

P 2: Industry expert.rtf – 2:1 [I think what he explained now ..] (2:2) (Super)

Codes: [Problem-based learning_practicals]

No memos

I think what he explained now is with medical students is: when you go with the students to the hospital in a practical situation. And the patient has got some sort of a problem, and you say how are you going to solve the problem before being told whatin the other way you would stand in the class and say this is what it is...this what it looks like ...and this is what you do, in this case students themselves actually gives the solution to the problem. So I think that's how the process will unfold.

P 2: Industry expert.rtf – 2:3 [That is you must remember that..] (7:7) (Super)

Codes: [Problem-based learning_practicals]

No memos

That is you must remember that if a student has finished his course, and is qualified as a designer. When the designer gets into the practical side of things, it's only one **cob in a big wheel**. The designer in many cases has got no contact with the problem, has got no contact with the client, does not even come out of the work station. Am just mentioning this because, the problem-based thing, the problem is most probably it is going to be a problem that will be put there, very clearly: this is what we need, you need to design a brochure, you need to design a presentation, it is not going to be so wide that the student is not going to be able to know what's going on. That's the one side of it. The other side is that, because of technology, because of the situation we are in, the students today need to know far more, generally, not about the specific subject matter, generally, than ten or twenty years ago. And it is because also of the media that we got.

P 2: Industry expert.rtf – 2:7 [You tend to do it like that wh..] (26:26) (Super)

Codes: [Problem-based learning_practicals]

No memos

You tend to do it like that when you study, you think you get a bigger problem, but it does not work like that out there, you get a section of the problem, and I must say that these days what's more important, and what's more relevant. What makes more of an impact is more of the personality rather than...one person might have all the tools, is been given all the tools, but when he gets to the challenge he hasn't got the confidence. Whereas another one has got half the tools, but he's got overly confidence, and he'll do it. So what we say is get yourself sorted out by solving lots of problems so that when you get there and you are being given the problem, you are able to solve it. and that's what you must know. Now I think it's difficult because I think if you think what the problem will be, you think in terms of what you've been studying, what you've been doing now, and it might be slightly different to that. And also as Mr Roger has mentioned, there's different levels, there's different ways of working. All the agencies do not work in exactly the same way. You know, there's internal agencies, there's places where you can go and work, where you are working for the Auditor General, has got the

old graphic design department, they do everything themselves, but they still come to us because there are certain problems they just can't solve. They do have the confidence, and it's because the vision is been narrowed because of the fact that they are on the inside. You go to the outside, you got challenged today by Vodacom, tomorrow by Gucci, the next day, so you, it becomes very confusing, that's why you got to goggle it, you know what it's about.

P 3: Lecturer.rtf – 3:3 [Khosana can I tell you last ye..] (9:9) (Super)

Codes: [Problem-based learning] [Problem-based learning_practicals]

No memos

Khosana can I tell you last year I spoke to a couple of guys in the industry, theatre directors. From three studios/agencies ... and one of the things that came on top of their heads...what we really wanted is thinking designers, people that can solve problems. Typically, if I've given you a campaign, here's the whole campaign, you must go and see what the clients wants for that campaign; they must not be told what to do, they must think the whole thing out, problem-solving thing is good practice, problem-based is good practice. For the people that live here, or practice in thinking the problems out already, like if I presented this, look at this thing here, what is the problem with this, the client needs that. What does the client need to advertise this problem; in other words they must be thinking designers, not just do this and they do that; they must know why they are doing it; they must be able to solve problems.

P 3: Lecturer.rtf – 3:7 [We give the students projects ..] (24:24) (Super)

Codes: [Problem-based learning_experiment] [Problem-based learning_practicals]

No memos

We give the students projects like, at least one project where they get a project as a group,... it's like groups of three or four, and they have to perform this project together. It is to experience a bit of this working together and solving problems together. But I must say the students don't really like it. They don't like it, because I always get the problem, I see it with Jason today. You get three guys working on a project, and only one or two are pushing or pulling their weight and the rest are just, ehh, you do

Code: Problem-based learning_value added {1-0}

P 3: Lecturer.rtf – 3:4 [It's because they are adding v..] (12:12) (Super)

Codes: [Problem-based learning_value added]

No memos

It's because they are adding value ...it's a value-adding process. If you go and work somewhere, you must add value. You must be able to solve all sorts of problems/challenges, instead of what Wessels says, just sitting there and just taking..

Code: Student benefits {1-0}

P 1: Head of dept.rtf – 1:8 [I take that as an order from t..] (25:25) (Super)

Codes: [Student benefits]

No memos

I take that as an order from the committee.... because, look, I can see a lot of benefits for the students, if I do the thing right, as the facilitator/as the lecturer, but I must also guard against the pre-conceived ideas about talking and chalking as it is always easiest option for us. So if you say then I have to prepare something, and submit to the next meeting, at least for critique and comment, I'll take that as a decision, or as a request or as a suggestion. At least I can take it from there, taking consideration of particularly the comments that you made, I think they are pretty valuable. The comments from the industry as well, I think, particularly the comment that I will never do the research, but I've got to know about it, and I assume that I will get hold of the report that happens to be interpreted, to apply the results. Yes and they will actually do something other than being told what to be told how it is done. Yes I've accepted your suggestion.

Code: Student feedback {1-0}

P 3: Lecturer.rtf – 3:9 [In other words, maybe the stud..] (30:30) (Super)

Codes: [21st century students learning skills] [Student feedback]

No memos

In other words, maybe the students should as a class, come up with ideas and tell us how they would like to be taught. Because I think they've got a pretty good idea of what's going on outside there in the world. They know a hell of a lot more I think than we think, you know, and maybe they've got some good ideas on how they should be taught, and maybe they must be let us know how should this thing work. And I say now there's another problem. Because of the background... because of the composition of the classes, and the different background you get the guys that are, that would like the problem-based teaching, and then the guys that would like to have the sort of conventional teaching, where they are told what to do. I can tell you right now, you know, that percentage is probably going to be maybe 50:50, or maybe 60 for the problem-based teaching, and the rest maybe for the guys who would actually would like to know...to say it quite straight, this the poorest students, the students who have not almost been like exposed as much as the lot of the students, they have not been exposed to the sort of things, so they need a lot of help, and I think those students are going to be, to want to be taught in a conventional way, I can tell you right now. Am convinced that there is going to be a percentage like this of two groups that one would like this and that would like that. To me that's almost like how do you solve that sort of thing?

Code: Students' challenges {1-0}

P 5: Student 2.rtf – 5:4 [Yes I think it does, because a..] (12:12) (Super)

Codes: [Problem-based learning_challenge] [Students' challenges]

No memos

Yes I think it does, because another thing that, another problem or challenge that we faced with, we find that some of the students are not very comfortable in presenting or putting their ideas. You find that they've got very good ideas, but when it comes to presenting them they are not very keen on presenting them. But the more we cover we motivate them and encourage them to do certain presentations and so they become more confident, and speaking towards certain people and then by the time they get to the industry they've already got that confidence that Mr Wessels was talking about, of being confident in whatever that you are going to present even though it might not be the best idea but the fact that you have the courage to actually speak to somebody about it and try and convince them that it should be the way that it should be done, I think it works

Code: Students' knowledge {1-0}

P 2: Industry expert.rtf – 2:2 [Just to me, from my experience..] (4:5) (Super)

Codes: [Students' knowledge]

No memos

Just to me, from my experience, there's one problem that arises is: what does the student know, what to look for, if he has not been trained to a certain degree to look for certain things. How does he know this is a slim-shape, but without a bit of knowledge, or general knowledge of what design is all about, etc., he does not really know what he looking at. Do you understand? I think he first needs some basic knowledge to be able to know what to look for. Yes....

Look I do not know much about this, but to me that's the problem, it is definitely a problem. You must know what to look for before you can comment, especially when it comes to design. The students must have some basic knowledge...I don't want to talk too much..

Code: Students' participation {1-0}

P 1: Head of dept.rtf – 1:2 [Can I just ask the same thing...] (8:8) (Super)

Codes: [Students' participation]

No memos

Can I just ask the same thing... the students must just respond as well....that means when we will do this module with the students the next quarter; that we've got to make it/ they've got to know that they've got to be able communicate directly and tell them they are fed-up or to say they like it, it works well. Is that correct? Yes.

Code: Teaching methods {4-0}

P 1: Head of dept.rtf – 1:1 [The students at the end of the..] (3:3) (Super)

Codes: [Teaching methods]

No memos

The students at the end of the day are the beneficiaries, and if we introduce a particular approach, and they are not receptive to that approach, as a lecturer standing up there you need to have a plan B.

P 1: Head of dept.rtf – 1:5 [Just to make a comment on shou..] (17:17) (Super)

Codes: [Teaching methods]

No memos

Just to make a comment on should be on systems... I think you've already answered that, you said educational science tells us that the worst form of learning is talk and chalk, because it's one way of communication. Other side of the spectrum like you said already, it's when people actually apply and do a thing, and when a motivation is there. And I assume that this problem-based is right there.

P 3: Lecturer.rtf – 3:8 [You know I see a problem here...] (27:27) (Super)

Codes: [Teaching methods]

No memos

You know I see a problem here. Am busy with the first-years, I used... method for the last three years...and this thing with problem-basedI was actually going to suggest whether we should not go to the students and ask them: now, how do you think we should teach you? How would you like to be taught, how, how must we teach you? Should that be problem-based? Must I give you problems to do? Then I'm just a facilitator, and then I help you? You come and tell me I must help you, you have done this and this....fix this and this should not work like this because of that, and so I facilitate the project for example

P 5: Student 2.rtf – 5:2 [In answering your question: I ..] (4:4) (Super)

Codes: [Teaching methods]
No memos

In answering your question: I think another way we can use is like, for example, if we get assignments that are going to be marked, students usually take an initiative to look at research because the primary motivation is that you want to pass. So, say for example, you get a certain topic that you have to deal with, I think it would be better if maybe like you are saying now that if we work in different groups, maybe get different groups, and assign them different topics within the module, and then get them to research it themselves, and then as an incentive sort of, tell them it's going to be for marks, maybe it would count for 3 or 5 %, or then if it's not for marks, then it's not for marks then they are not going to put an effort because it's like, why do I need to do it? if it's actually for marks, then maybe we could do like a kind of presentation within the class, as a form of a lecture. You actually get more, and you actually cover a lot more than you would have, had you just been lecturing and telling them what has to be done. So I think it's another way of how we can use it.
