

THE EFFECTS OF PROCESS ORIENTED GUIDED INQUIRY
LEARNING ON ACHIEVEMENT AMONG NURSING
STUDENTS IN A SELECTED PRIVATE
INSTITUTION OF HIGHER LEARNING

JEYA DEVI A/P COOMARASAMY

A Thesis Submitted to Asia e University in
Fulfilment of the Requirements for the
Degree of Doctor of Philosophy

June 2016

ABSTRACT

New graduates from the diploma in nursing programme are found to lack the confidence and ability to make appropriate patient care decisions based on credible evidence, critical thinking and clinical reasoning. To be part of today's healthcare environment, the students must learn not only these skills, but also be able to work as team members and as communicators of information for decision-making across interdisciplinary boundaries. These skills are difficult to impart through the current traditional teacher-centred methods.

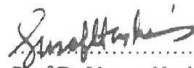
The primary purpose of this study was to determine whether Process Oriented Guided Inquiry Learning (POGIL), a constructivist-based instructional strategy introduced into a traditional teacher-centred environment would have an effect on the diploma in nursing students' academic achievement and confidence in learning. In addition, the study explored the perception of the students towards POGIL as an instructional method.

For the quantitative aspect of this mixed-methodological study, a quasi-experimental design was used to compare the achievement and confidence in learning scores between two groups of students who were in the final semester of the diploma in nursing programme (N=73). Statistically, there was no significant difference found in post-test scores and final school examination scores between the control (n=37) and experimental (n=36) groups although the mean scores were higher in the experimental group. The interactions between groups, gender and nationality in the post-test scores were also not significant. However, confidence in learning scores at the end of semester was statistically significant ($p < .05$) between the experimental and control group with the experimental group having a higher mean score.

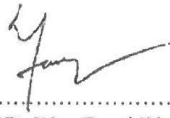
Qualitative data was gathered using a semi-structured interview format. The students perceived the learning environment created through the POGIL method as non-threatening and to have contributed to their self-confidence and motivation towards learning. In addition, they also stated that their skills in teamwork, communication, critical thinking and clinical reasoning had improved. Overall findings were extremely encouraging indicating that POGIL, as an instructional method has the potential to make a significant contribution to nursing education. Transversal competencies learned in a POGIL class would enable the nursing students to be “work ready” and adapt to the clinical environment with confidence.

APPROVAL PAGE

I certify that I have supervised /read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, as a thesis for the fulfilment of the requirements for the degree of Doctor of Philosophy.



.....
Prof Dr Yusup Hashim
Asia e University
Supervisor



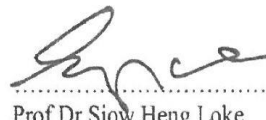
.....
Prof Dr Wan Fauzi Wan Ismail
Universiti Sains Malaysia
External Examiner 2



.....
Prof Dr Nor Aziah Alias
Universiti Teknologi MARA
External Examiner 3

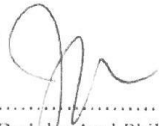


.....
Prof Dr Lim Pek Hong
International Medical University
External Examiner 1

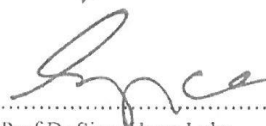


.....
Prof Dr Siow Heng Loke
Asia e University
Chairman, Examination Committee

This thesis was submitted to Asia e University and is accepted as fulfilment of the requirements for the degree of Doctor of Philosophy.



.....
Prof Dr John Arul Phillips
Dean, School of Education &
Cognitive Science

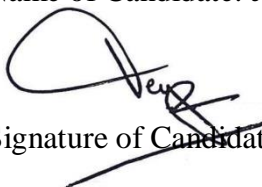


.....
Prof Dr Siow Heng Loke
Dean, School of Graduate Studies

DECLARATION

I hereby declare that the thesis submitted in fulfilment of the PhD degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making, this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which result in my expulsion from the programme and/or exclusion from the award of the degree.

Name of Candidate: Jeya Devi a/p Coomarasamy


Signature of Candidate:

Date: 30 June 2016

ACKNOWLEDGMENTS

The doctoral journey was not a solitary effort. I would have not made this far without my daughter, Kavita Sukanandan's continual support, motivation and the "push" to achieve my targeted goal. Thank you, Kavita.

My sincere appreciation and thanks to my supervisor, Professor Dr Yusup Hashim for his unfailing guidance and continuous encouragement through my journey.

To the former Dean, Faculty of Medicine and Health Sciences, UCSI University, Professor Dr Peh Suat Cheng, my deepest gratitude for giving the approval, comments on the research methodology, and support throughout the implementation of the POGIL activities at the School of Nursing.

I am truly blessed to have friends like Professor Dr Zainal Ariffin Ahmad, Deputy Dean, Student Affairs and Research, Universiti Tenaga Malaysia (UNITEN), Assistant Professor Dr Nyo Nyo Wint and Assistant Professor Dr Donna Lou Neri from School of Nursing, UCSI University. Your critical comments and being a constant source of support at times when I needed most would not be forgotten.

I would also like to thank Professor Dr John Arul Phillips, Dean, School of Education and Cognitive Science, Professor Dr Seow Heng Loke, Dean, School of Graduate Studies, and the administrative team of Asia e University for the help rendered through the five years.

Finally, without my diploma students from the 2009/2012 group, this study would not have taken place. I would like to acknowledge my sincere thanks to the students for being extremely sporting and giving the needed feedback on the instructional method.

TABLE OF CONTENTS

	Page
ABSTRACT	ii
APPROVAL PAGE	iv
DECLARATION PAGE	v
ACKNOWLEDGEMENTS	vii
LIST OF TABLES	xii
LIST OF FIGURES	xiii
LIST OF ABBREVIATIONS	xiv
CHAPTER	
1.0 INTRODUCTION	1
1.1 Introduction	1
1.2 Background of the Study	5
1.2.1 Nursing education in Malaysia	5
1.2.2 Diploma in nursing curriculum	7
1.3 Problem Statement	8
1.4 Purpose and Objectives of the Study	12
1.5 Research Questions	13
1.6 Research Hypothesis	15
1.7 Conceptual Framework	16
1.8 Overview of Research Methodology	19
1.9 Pilot Study	23
1.10 Significance of the Study	24
1.11 Assumptions and Limitations of the Study	25
1.11.1 Assumptions	25
1.11.2 Limitations	26
1.12 Definition of Terms	30
1.13 Overview of Thesis	34
2.0 LITERATURE REVIEW	36
2.1 Introduction	36
2.2 Learning and Teaching: Three Theoretical Viewpoints	37
2.2.1 Behaviourism	38
2.2.2 Cognitivism	43
2.2.3 Constructivism	52
2.3 Instructional Methods	55
2.3.1 The goal of an instructional method	56
2.3.2 The role of the lecturer	56
2.3.3 Students' motivational orientation	57
2.3.4 Assessment of learning	58
2.3.5 Student interaction	59
2.4 The Millennials	65
2.5 Process Oriented Guided Inquiry Learning (POGIL)	68
2.5.1 Development of POGIL	68
2.5.2 POGIL framework	69
2.5.2.1 <i>Cooperative learning</i>	70
2.5.2.2 <i>Guided inquiry</i>	77

2.5.2.3	<i>Metacognition</i>	82
2.5.3	Benefits of POGIL	85
2.5.3.1	<i>Ideal class size</i>	86
2.5.3.2	<i>Comparison of POGIL with lecture: Academic achievement</i>	87
2.5.3.3	<i>Comparison of POGIL with lecture: Confidence in learning</i>	92
2.5.4	Benefits and challenges to the lecturer	94
2.5.5	Assessment of POGIL as a process	94
2.5.6	Gender and POGIL	96
2.5.7	Racial groups and POGIL	96
2.5.8	Adverse outcomes of POGIL	97
2.6	Conceptual Framework	98
2.7	Summary	104
3.0	METHODOLOGY	107
3.1	Introduction	107
3.2	Research Design	108
3.2.1	Quantitative phase	109
3.2.2	Qualitative phase	111
3.3	Setting for the Study	112
3.4	Population and Sample	113
3.5	Sampling Techniques	114
3.5.1	Quantitative sampling	114
3.5.2	Qualitative sampling	116
3.6	Dependent and Independent Variables	117
3.7	Instruments	118
3.7.1	Quantitative phase	118
3.7.1.1	<i>Pre-test/post-test questionnaire</i>	118
3.7.1.2	<i>Instruments for continuous and summative assessments</i>	120
3.7.1.3	<i>Confidence in learning surveys</i>	123
3.7.1.4	<i>Pilot study</i>	128
3.7.2	Qualitative phase	132
3.7.2.1	<i>Data collection instrument</i>	132
3.7.2.2	<i>Pilot study</i>	135
3.8	The Experiment	139
3.8.1	Control group	139
3.8.2	Experimental group	139
3.8.2.1	<i>Learning groups</i>	139
3.8.2.2	<i>Role of lecturer</i>	142
	• <i>Designing of worksheets prior to class</i>	142
	• <i>In the classroom</i>	144
3.8.2.3	<i>POGIL activities</i>	145
3.9	Procedures for Data Collection	147
3.9.1	Quantitative phase	147
3.9.2	Qualitative phase	148
3.10	Data Analysis	151
3.10.1	Quantitative phase	151
3.10.2	Qualitative phase	152

3.11	Ethical Considerations	155
3.12	Summary	157
4.0	RESULTS	158
4.1	Introduction	158
4.2	Quantitative Findings	160
4.2.1	Demographic characteristics	160
4.2.2	Pre-test and Post-test Results	162
4.2.3	Research Question 1	163
4.2.4	Research Question 2	165
4.2.5	Research Question 3	167
4.2.6	Research Question 4	169
4.2.7	Research Question 5	170
4.3	Qualitative Findings	173
4.3.1	Background of the interviewees	174
4.3.2	Experiences with POGIL as an instructional method	175
4.3.2.1	<i>Learning/teaching environment: Non-threatening environment</i>	176
4.3.2.2	<i>Learning/teaching environment: Peer support</i>	177
4.3.2.3	<i>Learning/teaching environment: Learning through doing</i>	178
4.3.2.4	<i>Learning/teaching environment: Limited time</i>	179
4.3.2.5	<i>Summary statement</i>	179
4.3.3	Perceived outcomes achieved after POGIL activities	180
4.3.3.1	<i>Key transferable skills: Teamwork</i>	180
4.3.3.2	<i>Key transferable skills: Communication</i>	181
4.3.3.3	<i>Key transferable skills: Critical thinking and clinical reasoning</i>	182
4.3.3.4	<i>Summary statement</i>	183
4.3.4	Factors that influenced the outcome on how students perceived POGIL	184
4.3.4.1	<i>Personal factors: Motivation to learn</i>	184
4.3.4.2	<i>Personal factors: Self-confidence</i>	185
4.3.4.3	<i>Summary statement</i>	186
4.4	Summary	187
5.0	SUMMARY, CONCLUSIONS AND IMPLICATIONS	188
5.1	Introduction	188
5.2	Summary of Findings	188
5.2.1	Input	188
5.2.1.1	<i>Characteristics of students</i>	188
5.2.1.2	<i>Cognitive level before intervention</i>	189
5.2.1.3	<i>Confidence in learning before the intervention</i>	190
5.2.2	Outcome of POGIL as an instructional method	190
5.2.2.1	<i>Achievement level</i>	190
5.2.2.2	<i>Confidence in learning</i>	197
5.2.3	Learning environment: Perception of POGIL as an instructional method	198
5.3	Conclusions	206
5.4	Implications and Recommendations	210

5.4.1	Implications for nursing education	210
5.4.2	Implications for research	211
5.4.3	Recommendations	212
5.5	Final Summary	213
REFERENCES		214
APPENDICES		
Appendix 1	: Comments on Pre-test/Post-test	232
Appendix 2	: Beginning of Semester Confidence in Learning Survey	233
Appendix 3	: End of Semester Confidence in Learning Survey	237
Appendix 4	: Comments on Beginning and End of Semester Confidence in Learning Survey Instruments	241
Appendix 5	: Confidence in Learning of Nursing Students after Process Oriented Guided Inquiry Learning: Pilot Study	242
Appendix 6	: Participant Consent Form for Interview (Pilot Study)	249
Appendix 7	: Interview Questions (Pilot Study)	250
Appendix 8	: Interview Questions	251
Appendix 9	: Teaching Plan (Lecture Group)	252
Appendix 10	: Teaching Plan (POGIL Group)	254
Appendix 11	: Participant Consent Form for Interview	256
Appendix 12	: Approval to Conduct Study	257
Appendix 13	: Comparison of Means Before and After Intervention	258

LIST OF TABLES

Table		Page
3.1	Quasi-experimental Design.	111
3.2	Student Profile (N=73)	114
3.3	Internal Consistency Reliability (Pilot Test 1)	129
3.4	Internal Consistency Reliability (Pilot Test 2)	131
3.5	Summary of Actions Taken After Pilot Study	138
3.6	Activities in POGIL Classroom	147
4.1	Demographic Variables (N=73)	161
4.2	Pre-test and Post-test Scores	163
4.3	Interaction between Pre-test Scores and Groups	164
4.4	Main Effects for Group on Post-test Scores	165
4.5	Gender*Post-test Estimated Marginal Means	166
4.6	Group*Gender Post-test Estimated Marginal Means	167
4.7	Nationality*Post-test Estimated Marginal Means	168
4.8	Group*Nationality Post-test Estimated Marginal Means	169
4.9	Mean Scores in School Final Examination Results	170
4.10	Mean Scores in Before and End of Semester Confidence in Learning Survey	172
4.11	Factors with Significant p -value ($p < .05$)	173
4.12	Demographic Profile of the Interviewees (n=9)	175
4.13	Students' Experience of POGIL as an Instructional Method	176
4.14	Perceived Outcomes Achieved After Undergoing POGIL Activities	180
4.15	Factors that Influence the Outcomes on How Students Perceived POGIL	184

LIST OF FIGURES

Figure		Page
1.1.	Astin's Input Environment Outcome Model	17
1.2.	POGIL Model	19
1.3.	Research Design	20
1.4.	Non-equivalent Control Group Design	20
2.1.	Theoretical Framework	69
2.2.	POGIL Implementation Phases	101
2.3.	Conceptual Framework of this Study	105

LIST OF ABBREVIATIONS

ANCOVA	Analysis of Covariance
CERVIE	Centre for Research, Value Innovation and Entrepreneurship
GPA	Grade Point Average
IIS	Information Integrated System
LEAD	Learning through Evaluation, Adaptation and Dissemination
MOH	Ministry of Health
MQA	Malaysian Qualification Agency
OBE	Outcome Based Education
POGIL	Process Oriented Guided Inquiry Learning
PBL	Problem Based Learning
SIL	Student Independent Learning
SPSS	Statistical Package for Social Science
UEC	University Examination Centre

CHAPTER 1

INTRODUCTION

1.1 Introduction

Health care organisations are facing numerous challenges in dealing with a high number of patients with chronic and acute conditions demanding cost-effective quality care. Medical litigations are also on the rise due to advances in information technology. Patients and their significant others are able to get the needed information through the internet and other sources and would not hesitate to take the organisation to court. To stay competitive and safe in such a volatile health care environment, employers do not want to take any risk and are very selective when employing health care professionals.

Nurses form the largest group of health care professionals in any health care organisation. They have more contact time with patients in terms of time spent in face-to-face delivery of services and as communicators of information for decision-making across interdisciplinary boundaries. Thus, it is the right of employers to want nurses who are committed and have the ability to blend immediately into the working environment. Employers are looking at specific key skills that are required for effective clinical judgement other than technical skills. They want nurses who are able to write and speak well, source for evidence-based information and think critically to solve and manage nursing problems that may arise. These key skills which are also known by many other terms such as soft skills, basic skills and transferable skills have also been identified and emphasised by the Ministry of Higher Education, Malaysia, and the Malaysian Qualifications Agency (Malaysian Qualification Agency, 2008; Ministry of Higher Education, Malaysia, 2006). It is a mandatory requirement when developing programme outcomes and has to be

integrated into the curriculum and reflected in each course outcome in addition to the content (Ministry of Higher Education, Malaysia, 2006).

If the nurses are expected to provide nursing care beyond the traditional practice, then nursing education has to change its approach to teaching. Nursing education has to produce work-ready graduates who possess the required skills and the ability to demonstrate these skills with confidence while working as a team with other healthcare professionals. Rather than teaching nursing students an increasing amount of nursing content, lecturers must find suitable pedagogies/andragogy's which would enable the students to learn how to make nursing care decisions based on assessment, planning and evaluation through credible evidence, critical thinking and clinical reasoning. Such skills can never be learned through rote memorisation of facts. They can easily be forgotten and may not be suitable for individualised patient care. In addition, nursing students must learn about self-assessment, peer assessment and lifelong learning skills that are needed for them to stay competitive and give safe care (Candela, Dalley & Benzel-Lindley, 2006).

Nursing students coming to the programme and those who are entering the workforce are categorised as millennials, born between the years of 1982 and 2003. Their characteristics, values and beliefs are different from Baby Boomers and Generation X who make up the nursing faculty (Monaco & Martin, 2007). A summary of literatures show this generation is goal oriented, assertive, sociable and technology savvy, but have a short attention span, lack critical thinking skills, want immediate feedback and expect to be guided to succeed in and out of classrooms (Bernstein & Bhugra, 2011; Nicholas, 2008; Monaco & Martin, 2007; Altimier, 2004). Considering these characteristics, it can be argued that their learning

preferences might be different. The choice of instructional strategies must meet their needs as well as the expectations of those employing them upon graduation.

Teaching nursing students how to learn, and not just what to learn, is a challenge. The nursing curriculum emphasises on didactic and passive approaches to learning such as the lecture method (Ministry of Higher Education, Malaysia, 2010). Lecturers resort to these approaches due to the content laden curriculum that is based on standards outlined by the Malaysian Nursing Board (Nursing Board of Malaysia, 2010). The pressure is to teach as much as possible and to ensure that students pass the licensure examination set by the Malaysian Nursing Board. These standards have also not undergone much review to accommodate the millennials or the requirements of health care organisations although much has been talked about on the importance of “soft skills in nursing”.

Traditional lecture and lecture demonstration are effective methods for teaching difficult concepts, organise the way to think and solve problems in nursing (Di Leonardi, 2007; Mikol, 2005). However, the question is, will such an approach be able to produce nurses who can function effectively in a complex healthcare system? Within the current constraints of the curriculum, nursing lecturers need to develop teaching strategies that encourage the students to be actively involved in the learning process. In addition, today’s nurses need to learn to work cooperatively with their colleagues from other disciplines to provide safe patient-centred care. Thus, nursing programmes need to find suitable instructional methods that would enable students to learn interpersonal relations and communication skills.

It is impossible for the graduate to know everything in patient care. What is required is for them to learn how to react to different situations according to the needs of the patients. In essence, it is important for students to learn how to learn.

They should learn the skill of how to find out relevant and current information, reflect on it and apply it when it is required in a practical setting. The curiosity and desire to continue learning once their formal education has ended has to be continuously encouraged by the lecturers. As the famous Chinese saying states, “Give a man a fish and you feed him for a day, teach him how to fish and he can eat for a lifetime!”(McNairn, 2015).

A variety of student-centred instructional strategies have been introduced in institutions of higher learning to engage students in active learning. One such active instructional method that is gaining much popularity in the field of science and meeting the needs of new workplace challenges is Process Oriented Guided Inquiry Learning (POGIL). An instructional method developed in the field of chemistry in 1994, POGIL is currently adopted by many other disciplines to replace traditional lectures in the classroom (Farrell, Moog, & Spencer, 1999). Described as an instructional philosophy and a methodology on how students learn best, POGIL emphasises not only content mastery of a discipline, but also on the development of essential learning skills which are required for life-long learning (Hanson & Apple, 2004).

POGIL appears to have a remarkable potential as an instructional method to replace current traditional methods that are used in nursing education. However, as of 2015, there is no published article in Malaysia on the effect of POGIL as an instructional method in nursing education. As a background to understand the need for this study, a brief overview of the current nursing education system and the diploma in nursing programme in Malaysia is discussed and presented. A problem statement, purpose and objectives, research questions, research hypothesis, conceptual framework, research methodology and pilot study are then introduced.

The chapter ends with the significance of the study, assumptions and limitations, definitions of terms used and the overview of this thesis.

1.2 Background of the Study

1.2.1 Nursing education in Malaysia.

The development of nursing education in Malaysia has been extremely slow compared to the west and even Asian regions. The first school of nursing was established in Penang in 1947 and marked the beginning of formalised training for local nurses of both sexes. Training was influenced by the British system and schools were managed by English tutors. School leavers were employed as nursing apprentices and given “on-the-job training” (Mohd Said, 2011). Lectures emphasised on the curative aspects of patient care in a hospital setting and were given by medical doctors, matrons and sisters. In 1950, the regulatory body, The Nursing Board, Federation of Malaya, was established when the Nurses Act was enacted to control development of curriculum, regulation for conduct of final examination for licensure and to issue Nurse Registration Certificates (Mohd Said, 2011; Ministry of Higher Education, Malaysia, 2010). In 1969, the Act was extended to include Sarawak and in 1978, to Sabah. Since the Act’s enactment in 1950, the Nursing Board has remained under the Ministry of Health Malaysia.

In 1952, training of nursing students became more structured and the curriculum was based on standards set by the General Nursing Council of England and Wales (Mohd Said, 2011). The three years and four months nursing programme used the block system and its curriculum comprised 20% theory and 80% practice. Upon completion, graduates received a Certificate in General Nursing. In 1992, the certificate programme was converted into a diploma programme, with the Ministry

of Health Malaysia continuing to be the major provider of the diploma programme (Ministry of Higher Education, Malaysia, 2010).

In 1993, the University of Malaya offered the first undergraduate programme, Bachelor of Nursing Sciences with honours. The three-year programme was a post-registration programme designed to educate diploma graduates to become nurse lecturers or nurse administrators. In 2003, Universiti Malaysia Sarawak took a bold step by becoming the first university to offer a four year Bachelor of Nursing (Honours) programme for fresh school leavers (Ministry of Higher Education, Malaysia, 2010). However, till today, students sit for the same licensure examination as diploma students, to be known as Registered Nurses (RN). The licensure examination given by Nursing Board of Malaysia has not changed over the years. It comprises of one hundred multiple choice questions which are mainly recall questions that require lower level thinking that emphasises memorisation of factual knowledge.

Postgraduate programmes at Masters and doctoral levels are now being offered at some public and private universities. However, the minimum educational standard to be a Registered Nurse is still a diploma in nursing. Looking at the current political scenario, the diploma programme will continue unless there is a drastic policy change from the Public Service Department. The bulk of Registered Nurses in Malaysia in clinical areas will still be diploma graduates.

The “Guidelines on Standard and Criteria for Approval of Nursing Programmes” was formulated in 2007, by the Nursing Board of Malaysia and revised in 2010, is still used as a guide to develop the current diploma curriculum. This instrument is also used by all agencies such as the Ministry of Higher Education and

the Malaysian Qualification Agency for auditing nursing programmes in Malaysia (Nursing Board of Malaysia, 2010).

1.2.2 Diploma in nursing curriculum.

The aim of the “Guidelines on Standard and Criteria for Approval of Nursing Programmes” is to standardise nursing education at the national level (Nursing Board of Malaysia, 2010). These guidelines stipulate how the curriculum content should be designed, implemented and evaluated. Total credits needed for a three year diploma programme is 90 to 115 credits. The curriculum components consist of three core sciences: Health Science (10-20%), Behavioural Sciences (10-20%) and Nursing Sciences (60-80%). At least, 45-55% of the curriculum has to be theory and 45-55% practical. Teaching and learning approaches are didactic in the form of lectures, tutorials and practical. Student learning is assessed through continuous assessment (30-40%) and summative assessment (60-70%) in the form of written examinations.

The curriculum that is controlled by the Nursing Board has been in place for more than 25 years and is prescriptive and does not allow for any flexibility that encourages innovative teaching-learning methodologies. The emphasis of the Ministry of Higher Education and the Malaysian Qualification Agency is on student-centred approaches. However, the nursing standard encourages the use of teacher-centred instructional approaches.

Prior to 2010, entry requirements for the diploma in nursing programmes as stipulated by the Nursing Board of Malaysia, is a pass in *Sijil Pelajaran Malaysia* (Malaysian Certificate in Education) or an equivalent with three credits including one science subject and a pass in Bahasa Malaysia and Mathematics. From 2010, the requirement was raised to five credits inclusive of Science and Mathematics. In

January 2014, the Nursing Board of Malaysia made it mandatory for a credit in Bahasa Malaysia.

1.3 Problem Statement

Didactic teaching methods are still being used widely in the diploma programme with emphasis on technical skills with checklists to ascertain “competency” (Ong-Flaherty, 2012). In such an environment the lecturer plays an active role in transferring information and the nursing students are indirectly encouraged to become passive recipients of knowledge (Lim, 2012). There is also no explicit and conscious emphasis in the classroom on the development of process skills (Hanson, 2004).

In the researcher’s personal experience as a lecturer, most of the nursing students do not actively participate in class discussions despite attempts to actively engage them in the learning process through the use of reflective questions based on prior knowledge of what they had learned in other classes or in the clinical area. It is a rare occasion to have one or two students asking questions in class to clarify their doubts or giving a comment or adding their views to what was presented in the lecture class. This observation is not only seen in the researcher’s school, but was also observed by Ong-Flaherty (2012) in classrooms of other nursing schools in Malaysia running the diploma programmes. Ong-Flaherty critically commented on the minimal contribution of the nursing students in a teacher centred classrooms. This is not encouraging as every course in the nursing curricula from semester one to the final semester is interlinked, and students are exposed to clinical practice from semester one to learn how to integrate theory learned in class to practice. When students are in the final semester, they are expected to have at least gained some

ability to use the knowledge they had learned in past semesters and from their exposure to the clinical cases encountered during their practicum in hospitals and community centres to the coursework they are currently learning. A retrospective review of end of semester lecturer feedback reports by the individual course lecturers in the School of Nursing from January to June 2010 indicates that the final semester nursing students are still dependent on the lecturers to provide them with necessary information that needs to be learned (Summary of Lecturer Feedback Report, 2010). Furthermore, from the researcher's own experience, the nursing students' were comfortable with didactic teaching methods. This was reflected in the end of semester online student evaluation for every course offered in the diploma programme for the semester from January to June 2010. To the open-ended questions on suggestions for improvement, the nursing students requested for slides that are comprehensive enough for them to use as notes to study prior to an examination (Student Online Evaluation Reports, 2010). They also indicated they wanted the slides to be given to them before each class. Based on personal experiences of the researcher and reflecting on the observations and feedback given by lecturers during school meetings most of the students rarely take notes in class or bring the required textbooks or make any attempt to get reference books from the library or look up online references to complement their class lectures.

Nursing being a practice-based profession requires students to apply theoretical knowledge in an integrated and meaningful manner in patient care. Integration of practical knowledge is a pre-requisite in clinical situations. Limited theoretical knowledge may raise difficulties for the students to apply and gain the required practical knowledge. In the clinical area, it has been observed and documented often by the clinical instructors in their weekly report that the students

are performing clinical skills like a “robot” and if there is any deviation from the norm they are unable to react and find it difficult to apply concepts learned in the classroom to the practical setting. Students have to be constantly supervised by a clinical instructor or lecturer. It is not difficult for the students to pass their school examinations and the final registration examination by the Nursing Board of Malaysia due to the nature of the questions, but reflecting on the comments by the clinical instructors, the nursing students lack many of the key skills demanded by potential employers. Ong-Flaherty (2012) critically recalled of her visits to Malaysian private and public hospitals and commented on the lack of communication between the nurse and the physician and the lack of assertiveness displayed by the nurses on patient care related issues when compared to American nurses. She attributed this lack to unaccustomed critical and analytical thinking as well as the absence of reflective learning in the educational approach.

The ND 306 Communicable Diseases course is offered in the final semester of a three year diploma programme. This course, which is categorised under nursing sciences, was not producing the desired results in the final semester examination. In the January to June 2011 semester, there were 32 students. All the topics were taught using the traditional lecture method. End of semester grades showed that 18.8% (6 students) of the students obtained marks below the required 50% passing rate. A total of 15.6% (5) of the students had a grade D and 3.1% (1) a grade F, in the final school examination results (School Examination Board Report, 2011). Only 12.5% (4) students managed to get a grade B, while 21.8% (7) obtained grade C+ and 46.9% (15) a grade C. When students come to the final semester they are expected to have a good grasp of what they had learnt in previous semesters and to connect what they had already learned to the new concepts they are learning. One of the important pre-