



**REFLECTIVE PRACTICE IN MEDICAL IMAGING
EDUCATION**

BY

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degree of Master of Health Sciences**

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ABSTRACT

Although reflective practice has been implemented in many medical sciences programmes, namely the Medical Programme, the use of this method of teaching-learning is found to be lacking in Medical imaging Education. Published studies related to reflective practice in the Medical Imaging Programme is scarce. This research, therefore, aimed at reviewing the current trend of the use of reflection in Medical imaging education and to obtain the perceptions of students and lecturers of Medical Imaging Programme with regard to reflective practice. Finally, this research will present a framework for the implementation of reflective practice in Medical imaging education. This cross-sectional study involved undergraduate students and lecturers in the field of Medical imaging from institutes of Higher Education in Malaysia that have incorporated reflective practice in their curriculum. Online database Scopus was accessed for literature search on reflective practice, reflection and other reflection related terms, as applicable to education and Medical imaging. Questionnaires were developed based on the literature search and validated by the experts in Medical imaging education. They were subsequently distributed to the respondents. In total eighty-two students of Medical Imaging Programme (response rate of 100%) from three institutions and twenty-four lecturers of medical imaging programme (response rate of 48%) from five institutions were involved in the study. A total of 75.9% of the students (65/82) and 91.7% of the lecturers (22/24) were aware of reflective practice in their curriculum. They agreed that the use of reflection in Medical imaging teaching and learning could enhance the critical thinking skills, clinical skills, technological skills, and awareness toward radiation safety. Among the barriers identified related to the implementation of reflective practice in Medical imaging include a guideline within the curriculum and the uncertainties as to the action verbs or stems to be used to indicate reflection. The mentioned gaps were used to formulate a framework on reflective practice that could be relevant to Medical imaging education. The framework to integrate reflection in the modules using currently accepted educational trends was proposed. Assessment considerations were also included. Although both the students and lectures of the Medical Imaging Programme were in favour of the use of reflective practice, a better understanding of the framework underlying the implementation of reflective practice is needed to optimize its implementation and its effects on the teaching-learning of the students and lecturers.

خلاصة البحث

على الرغم من أن الطريقة التفكيرية قد تم تطبيقها في العديد من تخصصات العلوم الصحية، وبالتحديد التخصص الطبي، إلا أن استخدام هذه الطريقة في التعليم والتعلم كان محدودا في تدريس التصوير الطبي، حيث كانت الدراسات المنشورة المتعلقة بالطريقة التفكيرية نادرة في تخصص التصوير الطبي. ولذلك فقد هدف هذا البحث إلى مراجعة الاتجاه الحالي لاستخدام التفكير في تعليم التصوير الطبي، والحصول على تصورات الطلاب والمحاضرين في تخصص التصوير الطبي تجاه الطريقة التفكيرية. وأخيراً سيقدم هذا البحث إطاراً لتطبيق الطريقة التفكيرية في تعليم التصوير الطبي. وقد شملت هذه الدراسة المستعرضة طلابا جامعيين ومحاضرين في تخصص التصوير الطبي من معاهد التعليم العالي في ماليزيا التي أدرجت الطريقة التفكيرية في مناهجها الدراسية. تم استعمال قاعدة البيانات سكوبوس على الإنترنت للبحث عن المؤلفات المتعلقة بالطريقة التفكيرية، والتأمل، وغيرها من المصطلحات المتعلقة بالتفكير المرتبطة بالتعليم والتصوير الطبي. تم اعداد الاستبيانات بالاعتماد على نتائج مراجعة المؤلفات وتم التحقق من صحتها من قبل خبراء في مجال التصوير الطبي، وتم توزيعها فيما بعد على المستجيبين. بلغ مجموع المشاركين في الدراسة اثنين وثمانون طالباً من تخصص التصوير الطبي (معدل استجابة ١٠٠٪) من ثلاث جامعات و ٢٤ محاضراً في تخصص التصوير الطبي (معدل استجابة ٤٨٪) من خمس جامعات. كان ٧٥,٩٪ من الطلاب (٨٢/٦٥) و ٩١,٧٪ من المحاضرين (٢٤/٢٢) مدركين تجاه الطريقة التفكيرية في مناهجهم الدراسية، حيث اتفقوا على أن استخدام التفكير في تعليم وتعلم التصوير الطبي بإمكانه أن يعزز مهارات التفكير النقدي، والمهارات السريرية، والمهارات التكنولوجية، والوعي بالسلامة الإشعاعية. أما العوائق التي تم تحديدها والمتعلقة بتنفيذ الطريقة التفكيرية في التصوير الطبي وجود مبدأ توجيهي مدمج في المنهج الدراسي، بالإضافة إلى عدم التيقن فيما يتعلق بالأفعال أو المصادر الممكن استخدامها في الإشارة إلى التفكير. تم استخدام الثغرات المذكورة لصياغة إطار حول الطريقة التفكيرية التي يمكن أن يكون لها صلة بتعليم التصوير الطبي. وأيضاً تم اقتراح إطار لدمج التفكير في النماذج التعليمية تبعاً للاتجاهات التعليمية المقبولة حالياً، حيث شملت أيضاً توصيات التقييم. على الرغم من تأييد الطلاب والمحاضرات في برنامج التصوير الطبي لاستخدام الطريقة التفكيرية، إلا أن هناك حاجة إلى فهم أفضل للإطار الذي يكمن وراء تطبيق الطريقة التفكيرية لتحسين التنفيذ وتحسين آثاره على التعلم والتعليم للطلاب والمحاضرين.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Health Sciences (Medical imaging)

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DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Raja Farahhana Binti Raja Azhar

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The main reason why graduates are not able to be employed is because they do not have the soft skills that are required by the employee (Hassan et al., 2013). The authors further emphasize that in spite of excellence in academic, graduates need to have excellent soft skills include communication skill, leadership, teamwork and critical thinking. In order to meet these skills, Salleh (2014) states that higher education institutions should design a holistic approach to develop ethical values and soft skills among their students. The said author further explains that an institution of higher education plays a big role in producing graduates who are competent, innovative, competitive and good in characters to meet the needs of the development of the country.

The education system currently being practised in higher institutions of education in Malaysia is based on the framework of Outcome- based education (OBE) (Salleh, 2014). As being described by Spady (1994), “Outcome-Based Education means clearly focusing and organizing every- thing in an educational system around what is essential for all students to be able to do successfully at the end of their learning experience”.

The implementation of OBE in the education system obeys the concept that has been stressed by Kilgour (2011) “The process of learning is not just absorbing facts, but structuring the information received, and using it to develop advanced thought processes”.

These advanced thought processes are established as outcomes, require among others, re-looking at the curriculum. When outcomes have been established, educators should design curriculum to deliver students the knowledge and skills they need to demonstrate the outcomes (Brandt, 2016).

In medical imaging education, Sadler (2009) suggests that the education should be able to develop and foster the learning outcomes of a learner which include, cognitive abilities, integration of knowledge, problems solving and critical thinking. However, Kilgour (2011), highlights that developing the learning outcomes mentioned before is difficult, to assess it precisely is even more difficult. The raised issues by these authors should be given deep thought by the academicians in terms of aligning the desirable attributes to the assessment considerations. One of the possible resolutions of the mentioned issues is the use of the reflection in the teaching and learning. Reflective practice in teaching and learning is signified to the incorporation of the idea in which the students learn through reflection to the current approaches in education. It is implemented in the teaching and learning with the use of various reflective approaches. Strampel and Oliver (2007) state reflection usually relates with the word of awareness which could lead the learners to gain the information from an experience. It is taken as a process of learning from experience which makes a learner to return to their past for analysing and interpreting the information to enhance learners' understanding and awareness of the issues (Sandars, 2009). Through reflection, the students could analyse, enquiring, and reframe their experiences with the aims of learning and enhancing the reflective practice (Aronson, 2011). It could be concluded that the use of the reflection in Medical imaging education might be utilised to achieve the domain of learning in Medical imaging.

1.2 STATEMENT OF THE PROBLEM

There is petite to suggest that the presence of studies that relate to the use of reflection towards fulfilling the objectives of current approaches of education; Outcome - Based Education (OBE), Self - Directed Learning (SDL), Student - Centred Learning (SCL), Blended Learning and Flipped learning. While it can be argued that reflective writing has been used in many institutions, the variety in assessing the writings is translated into subjectivity with depend on the individual lecturers in these institutions. Furthermore, within the Malaysian context, the real appreciation of reflection by the students in preparing them for future employment in the field has yet to be explored. On the part of the lecturers, their perceptions towards reflection in terms of its used in teaching and learning and assessment tools have yet to be established. The effectiveness of various reflective approaches as an assessment tool to be applied to the various domains in medical imaging may need to be agreed upon by both students and lecturers. It would be challenging to use the reflective approaches as assessment tools in the various domains of medical imaging; patient- care, use of technologies, the technicalities, quality, safety, economy, meeting customer expectations and professionalism. In order to provide evidence of reflective approaches in teaching and learning, it is suggested that an effort to study the use of reflection in education needs to be done.

1.3 RESEARCH QUESTION

1. What are the perceptions of students of Medical Imaging Programme on reflective practice?
2. What are the perceptions of lecturers of Medical Imaging Programme on reflective practice?

3. How can reflection be implemented effectively in Medical imaging education?

1.4 PURPOSE OF THE STUDY

This study aims to explore the use of reflection in Medical imaging teaching and learning. The study focused on collecting the information from the Medical imaging students and lecturers of the Medical Imaging Programme with regards to their knowledge, understanding and feeling towards the practice of reflection. The use of reflection in teaching and learning is expected to enhance various skills needed for Medical imaging students. For the purpose of this study, the terms reflection, reflective approaches and reflective writing are used interchangeably.

1.5 RESEARCH OBJECTIVES

1.5.1 General Objective

To address the reflective practice in Medical imaging education.

1.5.2 Specific Objective

The study aimed to achieve the following objectives:

1. To study the students' perceptions of Medical imaging programme with regard to reflective practice.
2. To study the lecturers' perceptions of Medical imaging programme with regard to reflective practice.
3. To present a framework of the implementation of reflective practice in Medical imaging education.

1.6 SIGNIFICANCE OF THE STUDY

It is hoped that this study will be able to contribute to the development of pedagogy in Medical imaging education. It could benefit to the enhancement of Medical imaging curriculum, improving the quality of teaching among Medical imaging lecturers and enhancing the learning ability of students of Medical imaging.

1.7 LIMITATIONS OF THE STUDY

The scope of the study was confined to the Medical imaging education for degree programme. Hence, the study sample was limited to Medical imaging students and lecturers from only five higher institutions of education.

1.8 CHAPTER SUMMARY

This chapter has presented and discussed the background of the study. This study is designed to explore the understanding, knowledge and perceptions on the use of reflection upon students and lecturers of Medical imaging in selected institutions of higher education. In recent years, the use of reflection in teaching and learning has become more widespread across the range of health professions. Unfortunately, there is still lack of data and evidence to support the use of reflection in Medical imaging education. This is seen from the context of medical imaging teaching and learning. Thus, the study of the literatures is necessary to explore the study on the reflection in Medical imaging education.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The aim of this chapter was to identify the direction of recent works in reflective approaches in Medical education and in particular Medical imaging education. This review focused on the identification of various types of reflective approaches and their usage in assessing the theoretical domains in the Medical imaging education scenarios. It is to be reiterated at this junction that for the purpose of this chapter, the terms Radiography and Medical imaging are used interchangeably. The research questions that guided this review were:

1. What are the types of reflective approaches used in Medical education within the last ten years?
2. What are the lessons learned from the use of those reflective approaches in the teaching and learning within the Medical education scenario?
3. What are the types of reflective approaches used in Medical imaging education?
4. How effective have reflective approaches been used in assessing the theoretical domains in Medical imaging education?

The search strategy initiates with the search for published studies on reflective approaches in Medical education. This study involved the Scopus database. Scopus is an important database in literature search studies for it is said to provide 100 percent Medline coverage. Thus, a full coverage of literature related to the field of Medical imaging is secured (Zainuddin, 2015). The inclusion criteria used in this study

comprised of published papers indexed in the said database. Only papers published in English, publications between the years 2006-2016, and papers that discussed the topic on reflective approaches in Medical education were examined.

In the first phase of the search, the Scopus database <http://www.scopus.com/> was accessed. The researcher used the word “Reflective” as the main search term. Using the search platform, publications option was from “2006-2016” and “All Documents” were entered. The search limited the search term to appear only in “Title, Abstract, and Keywords”. The total number of publications identified in the search was recorded.

Then the “filtering” function was utilized where only articles published in English were chosen. Filtering the results further, the search was then limited to six areas of studies: Medicine, Nursing, Health Professions, Social Sciences, Multidiscipline and Undefined. The number of articles was then recorded. The identified articles were then exported for further analysis using the Comma Separated Values (CSV) function which tabulated the resultant data into an Excel file. The data in the exported Excel file relevant to this study consisted of the name of authors, the title of articles, year of publication, journal title, abstract and keywords.

From the Excel file, the data were filtered for the number, types, and frequencies of articles that have the Reflective related terms. The reflective related terms indicate the reflective methods used in the current education system. Terms that include “Reflective Writing”, “Reflective Learning”, “Reflective Journal”, “Reflective Tool”, “Reflective Portfolio”, “Reflective Exercise”, and “Reflective Model” were filtered with the use of the “Source title” column. The results were tabulated. Descriptive analyses, as well as thematic analyses of the above results, were done. These were done to present an overall picture pertaining to selected disciplines in Medical education and later to compare that to Medical Imaging education.

The initial search identified 71548 articles in various subject areas that have the search term “Reflective”, either in the title, abstract or keywords. The total number of articles was then filtered to subject areas related to medicine: Medicine, Nursing, Social Sciences, Health Profession, Multidiscipline and Undefined. This gave a total number of 18676 articles. The breakdown within each subject area is given in Table 2.1 below.

Table 2.1 The Breakdown of Articles According to the Chosen Subject Areas.

Subject Areas	Number of Articles	Subject Areas	Number of Articles
Social Sciences	9395	Health Professions	693
Medicine	6801	Multidisciplinary	217
Nursing	1549	Undefined	21
Total		18676	

From the total number of 18676 articles, only 204 articles have one or more reflective related terms; “Reflective Writing”, “Reflective Learning”, “Reflective Journal”, “Reflective Tool”, “Reflective Portfolio”, “Reflective Exercise”, and “Reflective Model” in the titles of the articles. The term “Reflective Writing” contributed the highest frequency in the article titles, followed by “Reflective Journal” and “Reflective Learning”. It is to be reiterated at this point that for this study, the identified reflective related terms can represent the approaches used in Medical education, including those in Medical imaging education. Limiting the search terms to the title only denotes the emphasis or importance of those terms as the core discussion within the retrieved articles.

An increasing trend in publications with reflective terms was observed in publications related to medicine from 2006 till 2015 (Figure 2.1). The increasing trend suggests the awareness concerning the use of reflection in Medical education. In 2016,

a decrease in the number of articles with reflective terms is seen. This can be attributed to the fact that this study was conducted in October 2016. Thus, the exact number of articles with reflective terms till the end of 2016 was not obtained.

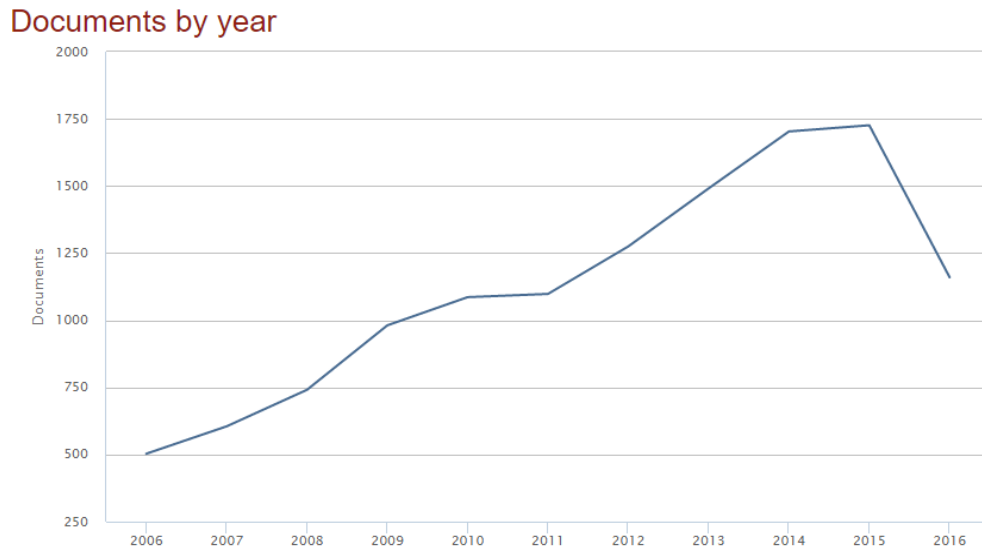


Figure 2.1 The Trend in Articles Indexed in Scopus with “Reflective” Terms from 2006 till 2016 Limited to Subject Areas Related to Table 2.1.

The themes and frequencies for which the Reflective related terms appear are given in Table 2.2. From the list of 204 articles titles, the data were filtered to identify articles that discussed reflective approaches in Medical Education and 113 articles were found.

Table 2.2 The Frequency of the Various Reflective Related Terms in The Articles' Titles.

Terms	Frequency in Article Titles
Reflective Writing	61
Reflective Journal	57
Reflective Learning	48
Reflective Model	11
Reflective Portfolio	10
Reflective Tool	9
Reflective Exercise	8
Total	204

A thematic analysis was performed. The scopes that each article highlighted for the 113 articles found are given in Table 2.3 below.

Table 2.3 Thematic Analyses of Articles' Title

Thematic Analyses	Frequency
Evaluation of reflective approaches in assessing theoretical domains in Medical education	67
Implementation of reflective approach in Medical education	16
Perception on reflective approaches: Students, Faculty, Teachers	14
Effectiveness of reflective approaches in Medical education	7
Models of reflective approaches	4
The concept of reflective approaches	3
Development of reflective approaches	2
Total	113

Table 2.3 shows the core areas that the researchers highlighted in their work. Generally, the articles on reflective approaches thematically suggest that the works concentrated mainly in assessing the reflective approaches in the learning domains of