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Information Literacy in Research Process Among Malaysian Teacher Trainees: Expectation and Inspiration of the Ministry of Education

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Abstract

The research investigates Information Literacy (IL) competencies in 'Seeking Skills' involving *accessing, evaluating and applying* appropriate information that is coherent to the 21st century teacher trainees' research requirements. The case study is designed as a qualitative exploratory, descriptive and explanatory survey that consist of a questionnaire survey on study population; and two face-to-face interviews with document analysis of theses from fourteen purposive samples taken from five northern states campuses. The study triangulates findings from questionnaire, in-depth interviews and document analysis to invoke trustworthiness by integrating quantitative and qualitative instruments to control bias. The findings signify a look back into the Malaysian Teacher Standards for realizing the Malaysian Education Blueprint 2015-2025. The study had found several factors lacking in the IL competencies that hindered the trainees' research process in meeting expectations of the blueprint.

Keywords: Information Literacy Research Process Model, information literacy competency; information seeking skills; information seeking behaviours; Malaysian teacher trainees; research process skills; teacher education research; teacher trainees research competencies

1. INTRODUCTION

The research investigates Information Literacy (IL) competencies in 'Seeking Skills' involving *accessing, evaluating and applying* appropriate information that is coherent to the 21st century teacher trainees' research requirements. The case study triangulate findings from questionnaire, in-depth interviews and the document analysis that combines quantitative and qualitative instruments to invoke trustworthiness (Mathison, 1988; Patton 2002). This study maintains a naturalistic triangulation to control bias (Denzin & Lincoln, 2011) in order to investigate IL competencies involving *accessing, evaluating and applying* appropriate information (Breivik & Gee, 2006; Mohd Sharif, 2008) that is coherent to the 21st century teacher trainees' research requirements (SCANS, 1991; Klien, 2011; NILRC, 2012; Margolis & Murray, 2014). The findings signify a look back into the Malaysian Teacher Standards (Malaysia, Ministry of Education, 2009) for realizing the Malaysian Education Blueprint 2015-2025 (Malaysia, Ministry of Education, 2015). The study had found several factors lacking in the IL competencies that hindered the trainees' research process in meeting expectations of the blueprint.

2. BACKGROUND OF THE STUDY

IL is fundamental in conducting a research process (Cook & Cooper, 2006). In today's undergraduate learning, this is defined as the ability of those who are 'information literate'. The training of young teachers for these skills is no different. These skills are coined in the *IL Competency Standards for Higher Education* by ACRL (2000) and later mapped by EBSS (2011) for a more relevant standard for teacher education. Many researchers had acknowledged that it is during teacher training and school internship practices, that trainees will be able to equip themselves with the 21st century teachers' basic skills (Carr, 1998; Edzan, 2008; Saidatul Akmar, Dorner & Gillian, 2011).

The IPGM's mission is to produce trained graduate teachers with life-long learning skills (Malaysia, MoE, 2011) of 'critical thinking', 'problem solving' and 'decision making' (Toffler, 1991 & Doyle, 1994) that are obviously necessary in a research process. The American teacher education followed this concept that was assigned by the Secretary's Commission on Achieving Necessary Skills (SCANS, 1991) for 'what work is required of schools' for the 21st century learners. The Malaysian Ministry of Education (MoE) gives emphasis to research process competence in their graduate teachers by stressing it in the Malaysian Education Blueprint 2015-2025 (Malaysia, Ministry of Education, 2015).

The teacher education curriculum in IPGM (*Institut Pendidikan Guru Malaysia* under the Ministry of Education) offers preliminary subjects of IL in the first semester after the trainees' enrolment. The program curricular requires trainee teachers to carry out a final project of school-based action research during the seventh semester, and submit a written report during their eighth and final semester. They are also required to complete a pre-service practical training at local schools and gather information on their projects during the seventh semester. The research investigates IL competencies to perform a research process of accessing, evaluating and applying information ethically in educational research among these trainees.

Based on the EBSS (2011) standard, an Information Literacy Research Process Model in Educational Research (Siri Sena, 2013) was used *(Figure 1)* to discover the IL competencies acquired by the final year teacher trainees in the northern region for their final project papers. The model consists of six stages of IL competencies to perform a research process of accessing, evaluating and applying information ethically in educational research.

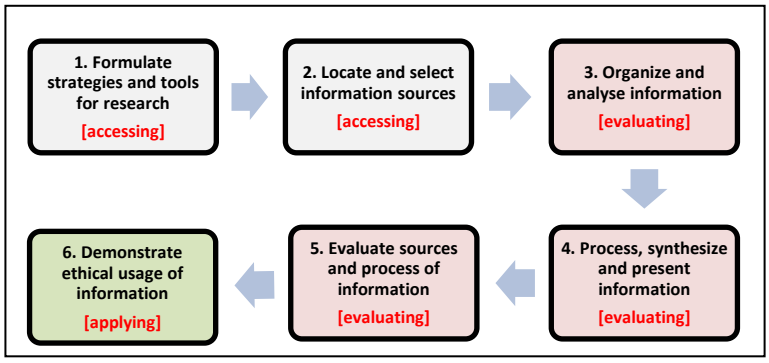

Figure 1 Information Literacy Research Process Model in Educational Research.

Firstly, trainees must be able to formulate their needs in selecting appropriate strategies and tools for their educational research. Secondly, they must be able to locate and select the needed information sources. Thirdly, trainees must be able to organise and analyse the information that they have found; fourthly, they must be able to process, synthesize and present the information that they had gathered. Fifthly, these trainees must learn how to

evaluate the sources and processes that they had used in order to bring value to their research. At the final stage trainees must be able to demonstrate ethical usage of information in their entire research process.

The study only covers the population of teacher trainees from five campuses of the northern region of Peninsular Malaysia (in the states of Penang, Kedah and Perlis). All trainees were registered in January 2010 and completed their study in December 2013. The scope of study is based on all 785 full-time final year undergraduate trainee teachers from the Educational Degree Programme under the MoE. All trainees have to conduct their school based action research in the three northern states. The study population was taken from the various departments of each institute in the three states. The case study is designed as a qualitative exploratory, descriptive and explanatory survey that consist of a questionnaire survey on 785 study population; and two face-to-face interviews with document analysis of theses from fourteen purposive samples from five northern region campuses.There were 242 sciences and 543 non-sciences subject major consisting of 237 male and 548 female trainee teachers. The purposive samples consist of seven male and seven female trainee teachers from various teacher education content-area of specialization. It is important to acknowledge that the findings from the study population had implied what the majority think and consider about the IL competencies during their research process, however the purposive samples are the primary data to ascertain the answers for the research questions.

3. RESEARCH PURPOSE STATEMENT

The purpose of this case study is to ascertain how much of IL competencies are involved in the research process of the Malaysian Teacher Trainees within the five northern region campuses. Further, the intention is to examine whether the trainee teachers have been able to competently implement the IL seeking skills of accessing, evaluating and applying information ethically during their research writing process in their 'true setting'(Eisenhardt, 1989). An Information Literacy Research Process Model (Siri Sena, 2013) is used to measure their competencies based on the IL Standard by EBSS (2011). The study also sought explanation as to what is lacking in their training period, to give insights to the ministry stakeholders in terms of needs, processes and outcomes.

4. RESEARCH OBJECTIVES

The research intends to discover with certainty the IL competencies acquired by the final year teacher trainees in the northern region for their final project papers. The Information Literacy Research Process Model is based on the benchmarked outcomes from EBSS (2011) IL standard for 21st century teacher education. The following underlines its prime objectives.

i. To analyse IL competency issues and behaviours of the trainees in accessing information for educational research topics.

ii. To examine whether the trainees exhibit IL competency characteristics in evaluating information for their action research.

iii. To ascertain whether trainees demonstrate ethical usage of information in their final project papers.

5. RESEARCH QUESTIONS

The case study answers the following questions:

i. How do the final year trainee teachers formulate their needs through information retrieval strategies and tools for research in educational topics?

ii. How do the final year trainee teachers locate and select information sources in doing an educational research?

iii. Are they able to organize and analyse information competently for their action research?

iv. What are the dimensions of IL used by the final year trainee teachers in processing, synthesizing and presenting their final project paper?

v. How do the final year trainee teachers evaluate the sources and processes that they have used?

vi. Are they able to use and disseminate information ethically in their final project papers?

6. LITERATURE REVIEW

Since first used by Zurkowski (1974) in a report to the National Commission on Libraries and Information Science (NCLIS), many descriptions of Information Literacy (IL) have brought out its conditions, values and usage over the years. Time and importance of information have taken the focus by Zurkowski on "ability to identify people trained in applications of information resources that relates to their work"; a step further. Today, an information literate person possesses greater skills than just the ability to identify information. As explained by American Library Association (1989), Behrens (1994), Carbo (1997), Plotnick and Association of College and Research libraries (ACRL, 2000) those who are 'literate' today know how to locate, and use the information in decision-making to solve real-life problems effectively and efficiently.

The development of Information Communication Technology (ICT) has corroborated IL through collaborated learning skills for young undergraduates in educational research (Intan Azura Mokhtar and Shaheen Majid, 2008). Based on recent developments, IL is not merely the concept of integrating ICT with involvement of resources applied in the work place as indicated by Zurkowski (1974). Today, IL implies its understanding of, and techniques of information literacy needed in the workplace (Laverty & Reed, 2006). Hence, IL is necessary for using information and then applying it in order to solve problems (Schleicher & Rubin, 2012). Chambers (2002) and Kendall (2005) affirmed IL as a concept of lifelong learning evolving the needs for educational workers to acquire new competences at the training process and then applying it into the workplace. Therefore, in the 21st century educational system, IL is a vital element that plays an important role in ensuring for a successful lifelong learning (UNESCO, 2006).

IL and its requirement on life's accomplishments, has further developed to become the major link in the knowledge and information-based society (Petrides & Nodine, 2003). Complementary to that, Chevillott (2007) explains that positive changes outside the teacher education institutes have largely influenced the IL requirement for all future school teachers. William and Coles (2007), Gandhe (2011) and Kokic (2012) writes that teachers' information literacy competencies today have great demand on usage of research evidence in their work. This largely influences their teaching culture within the education research. While a variety of description of IL have been suggested, this study tries to describe IL as problem-based learning skills (Jenkins, 2006). In such a manner, the IL seeking skills of 'accessing, evaluating and applying information ethically' (Breivik & Gee, 2006) has direct influence over the 'research process' (Mohd Sharif, 2008). This theoretical understanding is underpinned throughout this study in relation to the research process competencies.

The study uses the Information Literacy Standards for Teacher Education (ILSTE) by the Educational Behavioral Sciences Section (EBSS, 2011). The standard was approved by Association of College and Research Libraries (ACRL) at the Spring Executive Committee Meeting in May 11, 2011. The ILSTE provides a bridge between Information Literacy Competency Standard for High Education by the ACRL (2000) and the application of information literacy standards in then context of teacher education. The EBSS (2011) standard is intentionally used as a benchmark of outcomes; to perform in-depth study on the trainees based on three preliminary IL subjects that they had taken during their curricula training. This enables the study to ponder on the trainees IL competencies behaviour and practices in a 'teacher education contexts' (Cook & Cooper, 2006).

Throughout this study, the term 'information literacy competency behaviour' refers to these six following guidelines based on EBSS (2011) standard.

i. The information literate teacher education student defines and articulates the need for information and selects strategies and tools to find that information.

ii. The information literate teacher education student locates and selects information based on its appropriateness to the specific information need and the developmental needs of the student.

iii. The information literate teacher education student organizes and analyzes the information in the context of specific information needs and the developmental appropriateness for the audience.

iv. The information literate teacher education student synthesizes, processes, and presents the information in a way that is appropriate for which information is needed.

v. The information literate teacher education student evaluates discrete pieces of information as well as the entire information seeking process.

vi. The information literate teacher education student knows how to ethically use and disseminate information.

Hence, it is vitally important to understand that all these IL competencies indicators are used in mapping the Information Literacy Research Process Model (Siri Sena, 2013). The model was used as a yard stick to investigate these trainees' competencies of accessing, evaluating and applying information ethically in their research process.

7. METHODOLOGY AND INSTRUMENTS

The research deals with a 'logical problem' and not a 'logistical problem' as indicated by Yin (2003); Cohen, Manion and Morrison (2007). The study investigates IL in research process among trainee teachers within their true settings of the five northern region campuses. The case study employed mix method approach in conducting scientific research in education (Denzin and Lincoln, 2011). This study firstly used a questionnaire survey to gather quantitative *data* (Ololube & Kpolovie, 2012) on 785 full-time final year undergraduate trainee teachers as its study population from the five campuses. Secondly, two face-to-face interviews and document analysis formed the *qualitative data* (Denzin & Lincoln, 2011) from the 14 purposive samples. The case study employed the exploratory, descriptive and explanatory survey methods (Voss et al., 2002; Saunders et al., 2007), by probing inferences, interpretations, predictions and explanations of the trainees' information seeking behaviour in their research processes.

8. FINDINGS

It is important to acknowledge that even though majority of the study population think fairly of their three IL seeking skills, the purposive samples did not apply their ability of ethical usage in information as appropriately when it comes to their actual thesis writing. The findings (Table 1) clearly indicate that even though both groups had considerations of IL competencies within their behaviours, their application skills do not portray what they understood and believed in the form of their thesis writing. The study population covering 785 final year trainees' had considered and believed that they were able to apply ethical usage of information within their research process. This ability forms the highest ranks (35%) of IL competencies based on what they believed and voted to answer through the questionnaire. Unlikely was the case when the purposive samples were interviewed and Document Analysis Template (DAT) analysed for their thesis writings. The finding presents only 6.62% of their ethical application usage in information. Nonetheless, the accessing and evaluating of information were fairly and moderately seen by both the study population and purposive samples. Ultimately, the in-depth qualitative findings from the interviews and DAT clearly demonstrate their true comprehended behaviour in IL seeking skills regarding the accessing of information (50.28%) and evaluating of information (43.1%) as compared to their ability of ethical usage of information (6.62%).

Table 1 Comparison of IL Competencies in Research Process.

IL Competencies in Research Process	**Quantitative Findings From Study Population**	**Qualitative Findings from Purposive Samples**
	(Questionnaire)	(Interviews & DAT)
	%	%
Access of Information	32	50.28
Evaluation of Information	33	43.1
Apply Ethical Usage of Information	35	6.62

ATLAS-ti software (7th edition) was used to analyse the transcriptions from interviews based on two concepts of 'groundedness' and 'density'. Konopásek (2008) termed 'groundedness' as the number of data segments (e.g., quotations) associated with a particular code. Whereby, the term 'density' is the number of links (associations) between a code and other codes. The groundedness total of 3701 quotations explained the findings for the IL competencies of accessing, evaluating and applying information in the research process by the trainees.

Table 2 depicts the percentage of these IL competencies in their research process based on the Information Literacy Research Process Model pinned to the 14 indicators from the EBSS (2011) standard. The case study does indicate that IL competencies do emanate from the trainees' research process. Nonetheless, the existence is not equally demonstrated within the trainees' information seeking behaviour of accessing, evaluating and applying information ethically in their research process. The table indicates the research questions that were based on the six stages of the model. The groundedness of responses was found and its percentages indicate the trainees' level of competencies. Each finding from the research questions stated had fulfilled the three research objectives required for the IL seeking skills that had been used in their research process.

Table 2 Percentage of Information Literacy in Research Process by Purposive Samples.

Research Questions based on the Information Literacy Research Process Model	**EBSS Indicators**	**IL Research Process**
RQ1.How do the final year trainee teachers formulate their needs through information retrieval strategies and tools for research in educational topics? 1060 (28.64%)	1.Defines needs for information 2.Articulates needs for information 3.Select strategies 4.Selects tools	Access to Information (50.28%) Research Objective 1
RQ2.How do the final year trainee teachers locate and select information sources in doing an educational research? 801 (21.64%)	5.Locates information 6.Selects information	
RQ3.Are they able to organize and analyse information competently for their action research? 385 (10.41%)	7.Organizes information 8.Analyses information	Evaluate Information (43.10%) Research Objective 2
RQ4.What is the dimension of IL used by the final year trainee teachers in processing, synthesizing and presenting their final project papers? 810 (21.88%)	9.Processes information 10.Synthesizes information 11.Presents information	
RQ5.How do the final year trainee teachers evaluate the sources and processes that they have used? 400 (10.81%)	12.Evaluates individual information 13.Evaluates information seeking process	
RQ6.Are they able to use and disseminate information ethically in their final project papers? 245 (6.62%)	14.Use and disseminate information ethically	Apply Ethical Usage of Information (6.62%) Research Objective 3
Total Quotation Indication of Responses from the 14 purposive sampling = 3701 (100%)		

This study firstly found that the final year trainee teachers were able to formulate their needs through the application of information retrieval strategies and tools for research in the educational topics (*RQ1*). Here, these abilities form 28.64 % of their IL competencies within their research process. The study also acknowledged that their ability to formulate their needs through the application of information retrieval strategies and tools is the most capable outcome based on 1060 groundedness responses given by the trainees.

The second finding also indicated trainees were able to locate and select information sources in doing an educational research (*RQ2*). Here, these abilities form 21.64% of their IL competencies within their research process. The study found 801 groundedness responses indicating that they were capable of locating and selecting information sources in doing an educational research. Prior to these two findings mentioned (RQ1 and RQ2), the research can profoundly state that these trainee teachers do have IL competencies in 'accessing of

information' within their research process. Here, the IL outcomes for access of information totalled up to 50.28% of their research process. Therefore, these conditions correlate with the IL competencies as observed from the 'Information Literacy Competency in Research Process Model', which fulfilled the first research objective.

The third finding indicated trainees were also able to organize and analyse information competently for their action research (RQ3). Here these abilities form 10.41% of their IL competencies within their research process. The study found 385 groundedness responses indicating that they are capable of organizing and analysing information competently for their action research.

The fourth finding indicated that trainees had used many dimensions of IL in processing, synthesizing, and presenting their project papers (RQ4). The abilities involved 21.88% of their IL competencies within their research process. There were 810 groundedness responses indicating that they are capable of processing, synthesizing and presenting information competently for their final project papers.

The fifth finding indicated these trainees were also able to evaluate the sources and processes of information that they had used (RQ5). Here, these abilities form 10.81% of their IL competencies within their research process. The study found 400 groundedness responses indicating that they were capable of evaluating the sources and processes of information that they had used competently for their action research. Prior to these three findings mentioned (RQ3, RQ4 and RQ5), the research can profoundly state that these trainee teachers do have IL competencies in 'evaluating of information' within their research process. Here again, the IL outcomes for evaluate information totalled up to 43.10% of their research process; making it in line with the 'Information Literacy Competency in Research Process Model'. Hence, these findings did meet the fulfilment for the second research question. The last and sixth finding indicated that trainees have the least IL outcomes in the ability of using and disseminating information ethically in their final project papers. The study found only 245 groundedness responses that totalled up only 6.62% of IL outcomes for applying ethical usage of information in their research process. This finding answers the sixth research question.

Through the in-depth interviews and DAT analysis the researchers had found multitude responses about the problems faced by the trainees during their research processes. The study found nine respondents (R2, R5, R6, R7, R10, R11, R12, R13 and R14) that carried 57 (35.4%) of frequencies evidence from the whole total merging responses surveyed; indicating that 'time factor' was the greatest problem for them. They seemed to think that the practical training and thesis writing should not be made in the same semester because of time constraints for them to complete their theses and to fulfil the IPGM's guideline (EBSS-14.5). All nine trainees had suggested (from the interviews) that the thesis writing should be in one semester by itself in order for them to be able to present through understanding of the matter. Based on the DAT analysis, this explains the reason as to why only six of the purposive samples were able to comply their writing solely with the institution policies. The study also noted no difference between the science and non-science trainees in this matter.

The second problem that was found is the 'lack of resources and references in the IPGs'. There were 13 (R1, R2, R3, R5, R6, R7, R8, R9, R10, R11, R12, R13 and R14) trainees who responded to this matter indicating 65 (40.9%) of frequencies evidence from the whole total merging responses surveyed. The indication shows that a problem of 'lack in resources and references can be found at most of the IPGs inspected in regard to the trainees' research processes requirements. This explains the reason why the 13 purposive samples used most of their citations and references list entries (EBSS-14.4) based on Internet materials, and just one trainee (R4) had references from hard copies of journals that were borrowed from other universities.

Lastly seen was the problem of 'not enough proper guidance from the lecturers' in accordance to the trainees' research processes. The researcher found five trainees (R3, R7, R9, R12 and R13) that carried 37 (23.27%) of frequencies evidence from the total merging responses surveyed, who felt that they had not been given enough proper guidance by their lecturers and research supervisors. This explains the reason why all the 14 purposive samples had to seek for second opinions from specialist lecturers or subject matter experts (SME) in defining their research needs (EBSS-1.1).

The researchers consider that these merging responses may be used to guide the MoE's stakeholders in determining a better scenario for the trainees' exposure in the near future. In order to have a pool of competent trainees in the research process, a good management of time factor, enough resources for referencing, and a proper guidance from the skillful lecturers, is of prior importance.

9. CONCLUSION

It is a sound fact judging from the in-depth findings that IL competencies in the research process are within the trainees' abilities. Based on this, applying ethical usage of information is within the trainees' curriculum, but efforts on their academic practices are not sufficient to provide impact on their research processes. This profound insight should not be taken lightly, as it is important for the trainees to further develop their IL research process skills and competencies in future classroom activities. In striving for excellence, the academic trainers involved should be more concerned with ways on how IL skills can be multiplied through the research processes during the training of the trainees. The study is hoped to assert the paragon of excellence to which level of IL and needed in the making of the Ministry's undergraduate teachers through which the findings will spell out the needs, processes and outcomes as a standard for the aspiration of achieving competent 'world class teachers in the research processes in Malaysia' (Sulaiman Wak, 2014).

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