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Evaluating the Research Competencies of Doctoral Students

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Abstract

The main purpose of this study describe here is to evaluate the outcome of doctoral students studying either locally or abroad competency in research. The objective is also to compare their knowledge and skills in a) information seeking, b) research methodology, c) data analysis as well as, (d) communication of the research. There is no significant difference in the knowledge and skills indicating that similar outcomes are targeted and emphasized at doctoral programmes. Secondly it also indicated local institution training in research is comparable with universities abroad. However the finding also indicated further improvement need to be made to excel this graduate research knowledge and skills to higher level of competency. Better organized programmes are needed to achieve these outcomes.

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1. Introduction

Developed countries like America, Britain, Korea and Japan have a proportionate higher number of their human capital, researchers with doctoral degree compared to Malaysia. As the country has vision to be an industrial country, Malaysia has embarked on a plan to increase the number of graduates with doctoral training. There has been an increase in the number of its graduate with doctoral in the decade since the launching of its vision 2020. There has been an increase in intake and opportunities for doctoral studies in the local universities. Students are also sending overseas to gain their doctoral educations.

The development of human capital is important for research and development. Doctoral training has also been seen to provide research experience, knowledge and skills, irrespective whether the studies are done at local and overseas institutions. Even within the country, students have the opportunity to take up foreign-type training through their branch campuses. A number of overseas like universities have set-up their branch campuses here. A common goal of doctoral programmes, is that students would have to produce a theses or dissertations based on their research upon graduation. There are generally two types of offerings at doctoral levels.

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The programmes is either totally on research or course work and research. The former is totally focused on research and in the latter; students have to attend a number of courses or do course works before the candidates write their thesis. However both type programmes provide the students to gain knowledge and skills in conducting research.

As research and development is important for the economic development of a country, purpose of the study there is also the need to make sure students gain the appropriate knowledge and skills in conducting research. Since, Malaysia sends its citizen to pursue their studies either locally or overseas, questions might arise on quality of the programmes outcomes in research. As the stresses is on research, it would be appropriate to evaluate the programs, in terms of knowledge and ability to conduct research of the graduates the institutions produced. A study was thus conducted to compare the quality of outcome of doctoral graduates who have graduated either from the local or overseas programmes since Malaysia government has sponsored these students to pursue their studies after being selected through interview. To conduct research involved a number of skills thus what are with the components of research skills.

2. Method

A review of the literature made, revealed the components of knowledge and research skills that a researcher should have to function as researcher. The importances of having information literacy skills are important in a technological and information rich environment. This will equipped them to explore reputable information sources in their field of study and to practice evaluating the value of what they read or found. They should be well prepared to explore the research literature of their field using proper data based. This will guide them to compose or build focused manageable research questions. In their working life they ought to be able to use. The research tools with the understanding of information literacy skills.

Another component on the ability to conduct is the knowledge on research methods. A researcher should able to have the understanding of selecting and executing an appropriate method to conduct the study based on the research questions within the research environment they are in. Inclusive of the method is on the knowledge to use appropriate instrument for data collection including the knowledge and skills of the data analysis. The statistical knowledge and skills as measured on analysis of data forms another subcomponent. The above components formed the main construct in the questionnaire in this study which the main instrument for the study. The items of the questionnaire were Likert-type and grouped under five constructs, i.e.:

a. Research capacity
b. Reflection skills
c. Problem solving skills
d. Communication skills
e. Research methodology skills

The operations definitions of these construct are as follows:

a. **Research Capacity**

Analysis is the ability to gather relevant data and information and apply methods of synthesis, critical thinking and data reduction to locate and understand patterns or connections in that information. It might also involve in understanding and using statistical tests to examine differences between sets of data. Analysis required the background skills of data collection, data analysis, reflection and feedback, scientific experimentations.

Research capacity is the ability to carry out data collection procedures involving planning and selecting appropriate data collecting tools or instruments, identifying an appropriate method (quantitative and qualitative) for interpreting and manipulating data and applying an appropriate statistical tools for test of significance besides understanding. The limitations of analysis techniques (for example, understanding the assumptions behind a statistical analysis, and examining whether your data fit these assumptions) and drawing and interpreting appropriate conclusion from results of analysis.
b. Reflection Skills

Reflection is the ability to look back.
- Thinking about what you have done, what you might have done alternatively, how you feel about it, and how you might change it to improve your research (for example, reflecting on the outcomes of a research study and recommending on an alternative course of action for next other researchers).
- Using insight gained through reflection to improve for others who like to pursue similar research (for example, watching others perform and offering feedback on the way they are tackling a problem).

c. Problem Solving Skills

Problem solving is the ability to identify, define and analyze problems, to create solutions and evaluate them, and to choose the best solution for a particular context. It requires imaginative and innovative thinking to find new ways to approach a problem, analytical skills to examine the consequences of a particular solution, and reasoning skills to weigh one solution against another. Problem solving involves the background skills of imaginative and creativity, logic and reasoning, data collection, conceptual thinking, reflection and feedback, and scientific experimentation.

d. Communication Skills

Communicating skills is the ability to write and present the research and its findings. It is communicating to others the purpose and outcomes of research. It the ability to summarise information, explain the purpose, objectives, conclusions of the research, and tailor the communication to the needs and knowledge level of a particular audience.

e. Research Methodology Skills

- Identifying and designing appropriate research procedure understanding the limitations and scope of research design (for example, sample sizes and data type).

The above definitions were gathered through literature reviews (http://sydney.edu.au/science/uniserve_science/projects/skills/jantrial/research.htm and Subhan et al., 2012)

An instrument was developed to measure the research competent of the doctoral students, ability to conduct research, the desired outcome of the doctoral programs that they have attended. The instrument has been validated and has a moderate high reliability. A convenient sample of successful doctoral candidates sponsored by the Ministry of Education was selected. The sample consists of local and overseas trained candidates. They were contacted from a list of PhD holders prepared by the Scholarship Division. Each of them was told the purpose of the study was to compare the outcome knowledge in terms knowledge and the ability to conduct research based on their doctoral students.

The final, often neglected is the training ability to communicate the research and its findings. Academics and research practitioners are often insisted to write and publish their research. Doctoral students are often required to write and publish their theses in recognized journals in their field of study. These components form the ability conduct; research expected outcomes of the doctoral programmes, as part of a legacy of contributions to knowledge.
Table 1. Table of mean and standard deviation of research skills

<table>
<thead>
<tr>
<th>Intellectual capacity</th>
<th>Location of university</th>
<th>Mean score</th>
<th>Standard Deviation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research capacity</td>
<td>Local</td>
<td>4.54</td>
<td>0.40</td>
<td>0.34</td>
</tr>
<tr>
<td></td>
<td>Abroad</td>
<td>4.59</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>Reflection skill</td>
<td>Local</td>
<td>4.44</td>
<td>0.41</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Abroad</td>
<td>4.50</td>
<td>0.42</td>
<td></td>
</tr>
<tr>
<td>Problem solving skill</td>
<td>Local</td>
<td>4.58</td>
<td>0.43</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Abroad</td>
<td>4.68</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td>Communication skill</td>
<td>Local</td>
<td>4.48</td>
<td>0.42</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Abroad</td>
<td>4.53</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>Research methodology skill</td>
<td>Local</td>
<td>3.55</td>
<td>0.93</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>Abroad</td>
<td>3.69</td>
<td>0.84</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 reveals the descriptive and an inferential comparison analysis of research knowledge and skills preparations among the successful doctoral students who have studied at local and abroad institutions. Overall, regardless on the location of the university, it is noticeable that mean scores for five components of their ability to conduct research showed a high level (M≥3.67) achievement except on research methodology skill. Both local and abroad graduated doctoral students seemed to have acquired research methodology skill at moderate level.

A comparison of the outcomes the preparedness of students between two types of universities shows the doctoral students graduated from local institution fared equally in all five components of conducting of research skills studied. The only difference identified is the component with regard to research methodology skill. Local students recorded 0.14 lower mean values for this skill compared to students studied abroad. Whereas, very small difference found between the two groups of respondents were in the component of research capacity and communication skill. Based on the outcome of inferential analysis, the range of difference signified that the level of research ability and knowledge between two groups of respondents is statistically insignificant (p>0.05) in all components.

3. Conclusion

The results of the research showed there were no significant differences between the two groups of doctoral students in research preparedness skills. According their self evaluation, they have achieved reasonably well in their ability to conduct research. However the findings have to interpreted carefully taking into consideration, it is based purely on their self perceptions and the study only looked at the research outcome not encompassing other outcomes, such as the knowledge based of the field of studies and the culture of doing research (Rosli, 2010).

Despite this limitations, it is justifiable to conclude local universities also are capable of providing the training of graduates at Doctoral levels and perform are comparable with other institutions from abroad. However further research is needed to shed light on other aspects of doctoral education not covered in this research. Another implication of the study is that there is still room for improvement to enhance the research skills of these doctoral students' graduates perhaps through the involvement of doing research and specialized training workshops on especially on research methodology.

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References