

What are the problem-solving skills among international postgraduate students at the Universiti Sains Malaysia according to heppner's assessment?

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Abstract

This research paper aims to assess the problem-solving ability of international postgraduate students at Sains Malaysia University. To achieve the research goal, the researchers used Heppner's assessment to reveal the ability to solve problems. The assessment contains five dimensions: General attitude, Identification of the Problem, Generating alternatives, Making a decision, and Assessment. To reach the study result, the researchers used the Statistical Package for Social Sciences (SPSS) version 25. After ensuring the tools' reliability and validity, the researchers collected data from the randomly selected sample, and the number of students participating in the assessment reached 159 students. The researchers used the ANOVA test to get the findings. The study results showed statistical differences in students' abilities in problem-solving skills, where the students' excellence was in the skill of problem identification. The decision-making skill came in second place, followed by dealing with the problem, generating alternative solutions, and evaluating solutions. Based on the study results, the researchers recommended paying attention to problem-solving capabilities, especially assessing proposed solutions to solve problems and enhance and develop other skills.

Keywords: problem-solving skills, postgraduate students, Universiti Sains Malaysia, Heppner's Assessment

Abstrak

Kajian ini bertujuan untuk menilai kemahiran penyelesaian masalah di kalangan pelajar lepasan sarjana di Universiti Sains Malaysia. Kajian ini menggunakan ujian Heppner mengenai kemahiran penyelesaian masalah. Ujian Heppner melibatkan 5 komponen: Sikap, Kenalpasti masalah, Membina alternatif, Membuat keputusan, dan Penilaian. Kajian ini menggunakan Statistical Package for Social Sciences (SPSS) versi 25. Penyelidik mengumpul data melalui 159 peserta yang dipilih secara rawak selepas alat pengukuran telah disahkan dan di uji kebolehppercayaan. Penyelidik melakukan ujian ANOVA terhadap data. Data kajian menunjukkan terdapat perbezaan data statistik yang signifikan tentang keupayaan kemahiran penyelesaian masalah, yang mana kemahiran dalam mengenalpasti masalah adalah paling dominan. Komponen kedua adalah kemahiran membuat keputusan, diikuti kemahiran menangani masalah, membina penyelesaian alternatif, dan kemahiran mengukur penyelesaian masalah. Penyelidik mencadangkan isu penyelesaian masalah perlu difokuskan terutama mengukur cadangan penyelesaian masalah dan meningkatkan kemahiran yang lain.

Keywords: Kemahiran penyelesaian masalah, pelajar lepasan sarjana, Universiti Sains Malaysia, Ujian Heppner.

INTRODUCTION

Developed countries care about their individuals and are keen to develop their skills to face the various problems that face them in this century, whether they are individual or societal problems and even global problems. Since problems change at a speed with the advancement in time. Therefore, the ability to solve problems is an essential skill for all individuals (Razak & Kamarudin, 2021). However, this

rapid change in people's lives needs a different type of education that helps the student adapt to his environment and his community to live in financial and psychological safety (Matthews & Menna, 2003).

The World Bank warned of the low efficiency of university graduates globally. It confirmed that while there is a more excellent pool of higher education graduates, many still do not have the requisite skills necessary to effectively transition into the labour market (World Bank, 2020). In the same context, Ahmad (2013) and Kader (2013) Confirmed that Malaysian graduates do not fulfil the requirements, and they are not efficient at the workplace and lack soft skills in the workplace. Therefore, it seems clear that it is necessary to ensure the success of the plans implemented in Malaysian education to develop twentieth-century skills for university students. The most important of these skills is the ability to solve problems.

The problem can be defined as a goal that is difficult to achieve because of obstruction (Dabbagh et al., 2008). According to Hoxha and Surucu (2015), Adair defined the problem as is a status that comes onto and blocks one's way. While the solving problem is the set of operations that the individual performs using the information that he has previously learned and the skills he acquired in overcoming a situation in a new and unfamiliar way in controlling it and reaching a solution to it (Heppner & Petersen, 1982). In the same context, Abuzaitoun and Banat (2010) defined solving-problem as striving to achieve a goal to which there are obstacles and using a specific strategy to find a solution to this problem. Also, Sternberg and Sternberg (2012) defined problem-solving as structured steps in which the person who faces the problem seeks to overcome the obstacles that prevent him from reaching the goal. At the same time, Shute et al., (2016) define problem-solving skills as the ability to cognitively manipulate a problem and find a solution when a solution is unavailable. Thus, through defining the problem and solving the problem, it appears that there is a need for a strategy for those who wish to solve the problem to reach a creative solution to their problems; this cannot be done without the person having specific skills that enable him to solve the problem skillfully.

With the global concern in problem-solving ability skills, educational systems, curriculum planners, and educators are interested in this skill. The student's possession of this skill increases his self-confidence De Fleith et al., (2002) develops his educational capabilities (Abu Rayyash & Qutait, 2008; Zaytoun, 2004), extends his social relations with his friends, family, and society. Daunic et al., (2000) also maintains community security and reduces crimes (Ahmad, 2010). Some studies have also indicated that problem-solving affects students' mental health (Asimopoulos et al., 2018). Also, Al-Zayyat (2001) mentioned that solving a problem is the main entrance to the operation of the mind, which means problem-solving skills are a stimulant that stirs one's mind. It must be clear that providing the student with problem-solving skills will benefit him and his community (Al-Tabeeb & Al-Malool, 2016). On the other hand, Makhloofy and Budiaf (2017) and Abdeen and Ewies (2019) indicated that the problem-solving method is the way and the good beginning and the correct methodology to reach creative thinking and a refined, renewed production. This led Ewies and Murtada (2011) to point out that Problem-solving behavior is the most crucial aspect of employing thinking and using it in daily life to confront strange situations and think of various alternative solutions to these situations. In the same context, the importance of problem-solving is highlighted because it is located at the top of the learning hierarchy, where the learner processes information using his skills and experiences using structured thinking strategies to reach a creative solution (Melhim, 2002).

Amid global interest in twenty-first-century skills, including thinking skills and the ability to solve problems, Malaysia seeks to provide its students with these skills, whether local or international. Malaysia includes thirteen states, including Penang's state. Penang is in the northwestern part of Malaysia and has 1,049 square kilometers and a population of (1.7) people (The Source of Malaysia's Official Statistics, 2019). Penang's presence on an island is considered an important tourist site in Malaysia, and it is an industrial center for many international companies. In addition, Penang includes Universiti Sains Malaysia (USM), which has a long-standing reputation at the regional and global levels, as it is classified as the 37th Asian and 142nd in the world, making it a destination for international students; there are 2150 international students from 73 nationalities affiliated with the university (Universiti Sains Malaysia, 2020).

This study aims to determine the extent to which international students at the Universiti Sains Malaysia have the ability to solve problems according to Heppner's assessment. Also, it is expected that

this study will open the way for other research related to developing students' skills in the ability to solve problems and use modern theories related to this vital skill.

PROBLEM STATEMENTS

Due to the importance of the ability to solve problems, many studies have been conducted in this field; Hoxha and Surucu (2015) conducted a study in which he compared university students' abilities in Albania and Turkey to solve problems. The study used the Hebner tool in the ability to solve problems. The researcher concluded that university students in Albania have higher capabilities than university students in Turkey. Furthermore, there are no statical differences attributed to gender, while statistically significant differences were attributed to age.

In the same context, Abdul Karim et al. (2012) research paper aimed to determine the extent to which Malaysian graduate students possess soft skills. The study used a quantitative survey questionnaire consisting of seven areas, including the ability to solve problems. This study's results were consistent with Hoxha and Surucu (2015) study, where students of public universities distinguished students of private universities in the ability to solve problems. Besides, Ahmad (2013) conducted a study to determine how private institutes' students possess soft skills; the study included demographic variables related to gender, residence and the type of school the student attended. In addition, the researcher used a questionnaire to achieve the objectives of the study. The study found that students' possession of problem-solving skills was the weakest among students' soft skills.

To develop students 'problem-solving skills in Malaysia, Kader (2013) conducted a quasi-experimental study on two experimental and control groups. He studied the effect of teaching by problem-solving methods on developing students' skills in this skill. The study results showed statistically significant differences attributed to the program favoring the experimental group studied using the problem-solving approach. Ahmad (2013) also conducted a study to determine how Malaysian students in private institutions possess soft skills. The study relied on a questionnaire to achieve the research objectives. The researcher found that the ability to solve problems was ranked fourth among the seven soft skills included in the questionnaire, with a mean of (3.66).

It is evident from the presented studies that there is a lack of clarity or consistency in the output. While some studies claim poor problem-solving skills (Kader, 2013), others argue that students possess acceptable capabilities than their colleagues in private universities (Ahmad, 2013). The researchers also studied the ability to solve problems among soft skills and did not examine them separately. Besides, the study confirms that secondary school teachers possess high capabilities in the skills of the twenty-first century, which is the ability to solve problems among the most important of these skills (Shafiqah et al., 2021). The researchers also studied the ability to solve problems among soft skills and did not examine them separately. Besides, the last papers concentrate on Malaysian students under the graduated level, which may not give a clear answer to the question presented in this research paper: What are the problem-solving skills among international postgraduate students at the university sains Malaysia according to Heppner's assessment?

OBJECTIVES

This study aims to define the problem-solving Skills among International Postgraduate Students at the University Sains Malaysia According to Heppner's Assessment. Specifically, this study seeks to:

- a) To examine the level of problem-solving ability of international postgraduate students affiliated with the Universiti Sains Malaysia.
- b) To determine if there are statistically significant differences in international students' problem-solving skills at the Universiti Sains Malaysia.

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Based on these objectives, this paper seeks to answer the following two questions:

- a) What is the level of problem-solving ability of international postgraduate students affiliated with the Universiti Sains Malaysia?
- b) Are there statistically significant differences in international students' problem-solving skills at the Universiti Sains Malaysia?

Thus, the researchers will examine the following hypothesis

H_0 : There are no statistically significant differences in international students' problem-solving skills at the Universiti Sains Malaysia.

METHODOLOGY

This research paper used the descriptive and analytical method to examine the level of problem-solving ability of international postgraduate students affiliated with the Universiti Sains Malaysia and to determine if there are statistically significant differences in the problem-solving skills of international students at the Universiti Sains Malaysia. The study sample consisted of 159 international students from the Universiti Sains Malaysia, randomly selected. After confirming the instrument's validity, it presents it to ten educators specializing in education from university teachers, educational supervisors, and psychologists. The instrument's stability was ensured using the Alpha Cronbach equation. Its value among all paragraphs reached (0.76), an acceptable ratio for the instrument to be approved in the research.

The correction guide developed by Heppner was adopted to assess the level of students' possession of problem-solving skills and determine the students' level in each of those skills. Heppner's assessment includes 40 cases that the student answer according to the four Likert levels. The forty cases are divided into five skills: the student's attitude towards the problem when it occurs. The student's definition of the problem, finding alternative solutions, the method for the student to make decisions in solving the problem, and evaluating solutions. The responses were collected and entered into the SPSS program. The researchers used descriptive analysis and the ANOVA test to arrive at the results of the study.

RESULTS AND DISCUSSIONS

The results will be reviewed according to the study questions that the research paper seeks to answer, namely:

- a) What is the level of problem-solving ability of international postgraduate students affiliated with the Universiti Sains Malaysia?

The researchers used descriptive statistics, arithmetic means, and standard deviations to answer this question. According to Heppner's assessment correction guide, those who score higher than 80 in the test are considered to have problem-solving skills, and those who score less than 80 will have an unacceptable level in these skills. The analysis results showed that the students' mean in problem-solving skills was 118, which means they possess good problem-solving skills.

- b) Are there any statistically significant differences in international students' problem-solving skills at the Universiti Sains Malaysia?

This question related to the hypothesis

H_0 : There are no statistically significant differences in international students' problem-solving skills at the Universiti Sains Malaysia.

The researchers used the ANOVA test to determine if there are statistically significant differences in students' problem-solving skills. The results showed statistically significant differences in the overall scores of the test (Table 1).

Table 1 The differences in skills and the Heppner's assessment overall score for Solving-Problem Skills (HTSPS) used ANOVA test

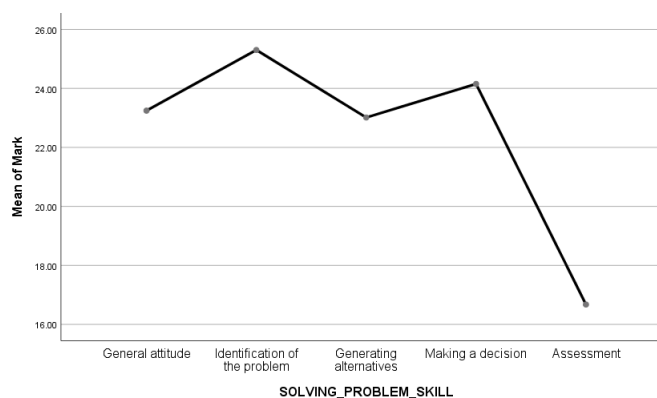
	Abilities	Mean	(±SD)	F	p-value
Overall HTSP	General Attitude	23.24	3.46	177.15	.000
	Identification of Problem	25.30	3.66		
	Construction of alternatives	23.00	3.27		
	Making decisions	24.15	3.09		
	Assessment	16.67	2.27		
	Overall score	22.47	4.38		

Hypothesis testing:

Table 1 shows that *P*-value was less than (0.05), so that the hypothesis was rejected, which means that there are significant differences between students' problem-solving skills.

To determine the direction of these differences and in favour of which problem-solving skills, the researchers used a Tukey test, which showed that the differences favoured the skill of Identification of Problem. Making a decision came in second place, followed by a general attitude skill, then a general alternative skill. A skill of assessment was the least apparent among the students (Figure 1).

Figure 1. Means plots show the direction of differences between solving-problem skills



IMPLICATION OF FINDINGS

The study aimed to explore the extent to which the problem-solving Skills among International Postgraduate Students at the University Sains Malaysia According to Heppner's assessment. The study results showed that international postgraduate students possess an acceptable level of problem-solving skills. However, the results also showed the need to train students in evaluating proposed solutions and generating alternative ideas. The study findings will help decision-makers choose the best programs that might help postgraduate students increase problem-solving skills; and allocating courses within the study plan to train students in problem-solving skills. According to Heppner's assessment, this study is limited to knowing postgraduate students' abilities to solve problem skills.

The study is also limited to one Government University named Universiti Sains Malaysia. The researchers recommended designing specialized training programs to focus on developing the ability to solve problems to hone students' capabilities, develop them, and meet their needs. Finally, there is an

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urgent need for university students in general and graduate studies to develop their decision-making skills, assess solutions, and propose creative solutions to problems. University students are among the most important tributaries of any country's institutions to build work and offer creative ideas for societal problems, which supports the vision of The Malaysian government is preparing the students of the Universities with suitable specifications for the labour market.

REFERENCES

- Abdeen, S., & Ewies, M. (2019). The Effect of Creative Acceleration Strategy on Creative Thinking Abilities of Talented Students in Saudi Arabia. *Jurnal Pendidikan Bitara UPSI*, 12, 21–27.
- Abdul Karim, A. M., Abdullah, N., Abdul Rahman, A. M., Noah, S. M., Wan Jaafar, W. M., Othman, J., ... Said, H. (2012). Nationwide Comparative Study Between Private And Public University Students' Soft Skills. *Asia Pacific Education Review*, 13(3), 541–548.
- Abuzaitoun, J., & Banat, S. (2010). The Relationship Between Psychological Adjustment and Problem-Solving Among Gifted and Talented Students. *Journal of Educational and Psychological Sciences*, 11(2), 39–64.
- Abu Rayyash, H., & Qutait, G. (2008). *Solving-Problem* (1st ed.). Amman: Dar Waeal for publication.
- Ahmad, A. (2010). *Educational achievement and its relation to Islamic and educational values* (1st ed.). Bairout: Husain Modern Library.
- Ahmad, S. (2013). Soft Skills Level Of Malaysian Students At A Tertiary Institution : A Comparative Case Study Based On Gender, Area Of Residence, And Type Of Schools. *International Journal of Asian Social Science Special*, 3(9), 1929–1937.
- Al-Tabeeb, M., & Al-Malool, M. (2016). Libyan experience in the care of gifted. *University Journal*, 3(18), 51–76.
- Al-Zayyat, F. (2001). *Cognitive Psychology*. Cairo: University Publishing House.
- Asimopoulos, C., Martinaki, S., & Maniadaki, K. (2018). Problem-solving Skills and Mental Health of Social Work Students in Greece. *Journal of Social Sciences Research*, 4(11), 220–228.
- Dabbagh, N. H., Jonassen, D. H., Yueh, H., & Samouilova, M. (2008). Assessing a Problem-Based Learning Approach To An Introductory Instructional Design Course: A Case Study. *Performance Impartment Quarterly*, 13(3), 486–500.
- De Fleith, D. S., Renzulli, J. S., & Westberg, K. L. (2002). Effects of a Creativity Training Program on Divergent Thinking Abilities and Self-concept in Monolingual and Bilingual Classrooms. *Creativity Research Journal*, 14(3–4), 373–386.
- Ewies, R., & Murtada, S. (2011). The Effectiveness of a Problem-Solving Method in Providing Kindergarten Children with some Thinking Skills, Experimental study in the City of Damascus on kindergarten Children from the age of (5-6) years. *Journal of the Federation of Arab Universities for Education and Psychology*, 8(3), 107–136.
- Heppner, P. P., & Petersen, C. H. (1982). The development and implications of a personal problem-solving inventory. *Journal of Counseling Psychology*, 29(1), 66–75.
- Hoxha, G., & Surucu, A. (2015). Examination of the Problem Solving Skills of University Students in Albania and Turkey in Terms of Various Variables. *Participatory Educational Research*, 2(2), 14–27.
- Kader, Z. (2013). *Enhancing Students' Problem- Solving Skills Using Problem-Based Learning As An Instructional Communication Approach*. Universiti Putra Malaysia.

- Makhloofy, F., & Budiaf, N. (2017). The Effect of TRIZ Program (problem-solving) on Creative Thinking among Primary School Students in Warfalla. *Journal of Human and Social Sciences*, 1(30), 171–182.
- Matthews, D., & Menna, R. (2003). Solving Problems Together: Parent/School/Community Collaboration at a Time of Educational and Social Change. *Education*, 43(1), 20–23. Retrieved from <http://search.proquest.com/docview/62225563?accountid=27115>
- Melhim, S. (2002). *Research Methods in Education and psychology* (2nd ed.). Amman: Dar Almaseerah.
- Razak, N. S., & Kamarudin, N. (2021). Planning in Enhancing Higher Order Thinking Among Science ' S Students : the Future of Green Technology. *Jurnal Pendidikan Bitara UPSI*, 14(Special Issue), 114–118.
- Shafiqah, N., Rakwi, H., Shafie, S., Aishah, S., Ali, S., Malim, T., Besi, S., Lumpur, K., & Ali, S. (2021). Teachers' Understanding and Practices on the Applications of 21st Century Learning in Secondary School Mathematics In Miri, Sarawak. *Jurnal Pendidikan Bitara UPSI*, 14, 60–71.
- Shute, V. J., Wang, L., Greiff, S., Zhao, W., & Moore, G. (2016). Measuring problem-solving skills via stealth assessment in an engaging video game. *Computers in Human Behavior*, 63, 106–117.
- Sternberg, R., & Sternberg, K. (2012). *Cognitive Psychology* (6th ed.). Wadsworth: Cengage Learning.
- The Source of Malaysia's Official Statistics. (2019). Pinang Island. Retrieved September 17, 2020, from <https://www.dosm.gov.my/v1/index.php?r=column/cone>
- Universiti Sains Malaysia. (2020). *usm.pdf*. Retrieved September 19, 2020, from <https://www.topuniversities.com/universities/universiti-sains-malaysia-usm/postgrad>
- World Bank. (2020). Higher Education. Retrieved October 17, 2020, from worldbank.org/en/topic/tertiaryeducation
- Zaytoun, A. (2004). *Methods of Teaching Science* (1st ed.). Amman: Dar al Shorouq for Publication and Distribution.