Challenges Faced by Pre-university Students in Excelling STREAM Based Disciplines for a Better Future

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ABSTRACT

Malaysia has numerous challenges in the twenty-first century due to globalisation and advancements in communications technology. Malaysia places a high importance on STREAM based education in order to grow the country's workforce and ultimately meet the difficulties and expectations of a STREAM-driven economy. As a result, education is critical in developing capable and competitive pre-university students to meet the challenges of the 4.0 Industrial Revolution. Therefore, pre-university students must excel in STREAM based subjects in their Malaysian Higher School Certificate, also known as *Sijil Tinggi Persekolahan Malaysia* (STPM). Thus, pre-university students embark on one of the most exciting yet challenging paths to thrive in STREAM subjects such as science, technology, religiosity, engineering, artistry and mathematics. As such, the goal of this research is to uncover the problems encountered by these pre-university students in excelling in STREAM related disciplines in order to have a better future. A mix-method study was carried out to collect data from 46 semester 2, 2023 cohort pre-university respondents utilising a 30-item 5-point Likert scale questionnaire. Data were triangulated through interviews with six selected respondents. Document analysis was also performed on the pre-university students' Malaysian Certificate of Education (*Sijil Pelajaran Malaysia*) results, Semester 1 2023 Malaysian Certificate of Higher Education results and the Students' Database Application System. The quantitative data was analysed in percentile and the qualitative data was analysed using thematic coding and descriptive analysis. This study revealed that the primary obstacles experienced by pre-university students in excelling in STREAM related disciplines are difficulty in scoring, financial constraints, lack of enthusiasm in the subjects offered in school, lack of support and the requirement to work part-time. The findings of this study had important implications for policymakers, school teachers, school counsellors and syllabus designers in considering the appropriate approach to attract more pre-university students to excel in STREAM based subjects in future

Keywords: *pre-university students, STREAM, challenges*

INTRODUCTION

Malaysia's national education system consists of five stages of education: preschool, primary, secondary, post-secondary, and higher education. Post-secondary education includes the Malaysian Certificate of Higher Education (*Sijil Tinggi Pelajaran Malaysia*, STPM), diploma, matriculation and pre-university certificate. The national education system has provided numerous opportunities for Malaysian Certificate of Education (*Sijil Pelajaran Malaysia*, SPM) school leavers to continue their studies at local Form Six Centres or Form Six Colleges. In 2012, the Ministry of Education introduced a modular system of evaluation based on three semesters, with students evaluated at the end of each semester (Ministry of Education, 2012). The assessment consists of coursework and school-based projects. Two programmes are offered to the pre-university students known as the Pure

Science and Social Science in the Form Six Centres or Form Six Colleges. Each programme is offered with a package of STREAM related disciplines with standardised syllabus developed by the Ministry of Education.

STREAM refers to Science, Technology, Religiosity, Engineering, Artistry and Mathematics (Agustina, Rustaman, Riandi, & Purwianingsih, 2018). STREAM is expected to be able to connect humans, environment and society with God (Mubarok, Safitri, & Adam, 2020). STREAM create wholeness in the education system as the relationship between religious practice and academic engagement shows that higher levels of involvement are associated with positive academic achievements and improvements in overall schooling McMorris (2016). Table 1 displays the subjects offered in Form Six related to STREAM.

Table 1: Subjects offered in Form Six which are related to STREAM

STREAM	SUBJECTS
SCIENCE	Physics, Chemistry, Biology
TECHNOLOGY	Physics, General Studies (*Pengajian Am*)
RELIGIOSITY	History
ENGINEERING	Physics, Chemistry
ARTISTRY	Visual Arts
MATHEMATICS	Physics, Chemistry, Additional Mathematics, Economics, Business Studies, Management Mathematics, General Studies (*Pengajian Am*), Accounting

High academic achievement, a key priority for every student to continue their studies at a higher level, has become increasingly competitive in recent years. As a result, pre-university students must take on the challenge of excelling in STREAM-based subjects in their Malaysian Higher School Certificate, also known as *Sijil Tinggi Persekolahan Malaysia* (STPM). In other words, pre-university students engage on one of the most exciting yet challenging paths to thrive in STREAM-based disciplines such as science, technology, religion, engineering, art and mathematics.

Malaysia has numerous challenges in the twenty-first century due to globalisation and advancements in communications technology. Malaysia places high importance on STREAM-based education to grow the country's workforce and, ultimately, meet the difficulties and expectations of a STREAM-driven economy. As a result, education is critical in developing capable and competitive pre-university students to meet the challenges of the 4.0 Industrial Revolution.

However, it is undeniable that pre-university students confront numerous hurdles in excelling in STREAM-based disciplines to prepare for a better future. Ho Thi Thao Nguyen, Subarna Sivapalan and Pham Hung Hiep found many challenges in developing STREAM-based education in Malaysia (2021). Hence, conducting a study to explore and investigate the challenges faced by students at various levels of education, including pre-university students, in excelling in STREAM is vital. This is necessary in identifying the appropriate solutions at all levels for the betterment of the future. This study aims to identify the

challenges faced by the pre-university students in selecting STREAM-based subjects for a better future.

METHODOLOGY

This is a mix-method study comprising questionnaire, interview and document analysis. In this study, 46 pre-university students participated. They include 12 male and 22 female students from Semester 1, 2023 cohort with a population of 84 students. These respondents were selected from a premier secondary school in northern Perak. A 5-point Likert scale questionnaire with 30 items was used in this study. This questionnaire was adapted from a study conducted by Farah Liyana Azizan, Nor Amalina Ahmad, Nur Fazliana Rahim, Rohaiza Daud, Mus Chairil Samani, Mohd Alhafiizh Zailani, Mohd Aminudin Mustapha, Mohamad Fhaizal Mohamad Bukhori and Ahmad Alif Kamal (2017). There are two sections in this questionnaire. The first section is on Demographic details and the second section is on the various challenges faced by the pre-university students in exelling STREAM-based disciplines for a better future. This questionnaire was administered by using Google Forms. The data collected were analysed in percentages and presented in graphs.

Data were triangulated with semi-structured interview sessions with six selected respondents. These respondents were coded using pseudonyms such as “PUS 1” which refers to “Pre-university Student 1” to affirm confidentiality and anonymity. Six pre-university students coded as PUS 1, PUS 2, PUS 3, PUS 4, PUS 5 and PUS 6 participated in the interview sessions.

Document analysis was also performed on the pre-university students' Malaysian Certificate of Education (*Sijil Pelajaran Malaysia*) results, Semester 1 2023 Malaysian Certificate of Higher Education (*Sijil Tinggi Persekolahan Malaysia*) results and the Students' Database Application System.

The quantitative data was analysed in percentile and the qualitative data was analysed using thematic coding and descriptive analysis.

RESULT AND DISCUSSION

The finding in this study revealed that the primary obstacles experienced by pre-university students in excelling in STREAM-related disciplines are difficulty in scoring, financial constraints, a lack of enthusiasm for the subjects offered in school, lack of support and the requirement to work part-time. Refer to Figure 1 to view these obstacles.

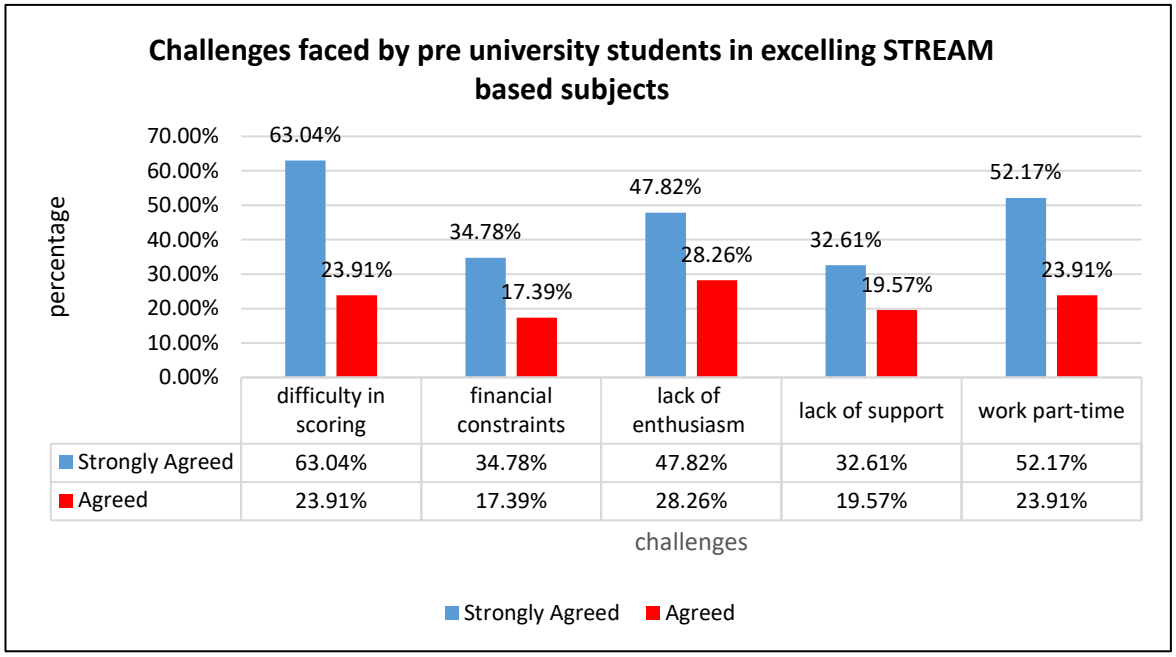

Figure 1: Bar graph on challenges faced by pre-university students in excelling STREAM based subjects

In this study, 63.04% of respondents strongly agreed and 23.91% agreed that difficulty in scoring is one of the obstacles that they faced in excelling STREAM related subjects. According to PUS 6, "usually subjects like Physics and Maths are very tough subjects and very difficult to score in exams. "

This study too brought to lit that 54.17 % of respondents who strongly agreed and 23.91% respondents who agreed that requirement to attend part time job is a barrier in excelling STREAM based subjects in school. Respondent PUS 1 claimed that, "don't have so much time*laa* to study so many times.. and sometimes feel tired too to study… " Respondent PUS 5 explained that, "we have to worklaa because we need money to buy books, photostat notes, top up handphone, and our *duit sekolah laa* (pocket money)." Hence, routine expenditures seems to be a very clear cause for these pre-university students to attend part time jobs.

Enthusiasm is essential for achieving success in STREAM related subjects. However, this study revealed that 47.82% of respondents strongly agreed, while 28.26% agreed that a lack of personal interest is one of the reasons why pre-university students fail to achieve in STREAM related subjects. PUS 4 express that subjects like "Arts boring *laa* teacher… and I am not so good in drawing, but no choice*laa* have to go *Seni Visual* (Visual Arts) class."

Document analysis of respondents' achievement in both Malaysian Certificate of Education (*Sijil Pelajaran Malaysia*) and Semester 1, 2023, Malaysian Certificate of Higher Education (*Sijil Tinggi Persekolahan Malaysia*) results confirmed that a lack of enthusiasm appears to be a cause of average and below-average performance among these respondents.

Financial constraints is detected as another issue for these respondents as 34.78% strongly agreed and 17.39% agreed. Interview data showed that financial constraints hinder these

respondents from gaining some supplementary aid in completing their compulsory assignments for STREAM based subjects in school. PUS 3 revealed that, "my family can not effort to buy a laptop and printer, so I have to go to my friend's house to do assignment. But have to wait *laa* my friend finish doing first." This respondent shared that, "we can not print so many times *laa* because using my friend's printer ink, … ink is also expensive." PUS 1 too added that, "need money too to buy A4 paper to print assignment." Sharing laptop and printer as well as spending money on A4 paper hinder these respondents from printing the assignments draft by draft to rectify some errors pointed out by the teachers from time to time. Meanwhile, PUS 2 admit that, "taking private tuition is good for better understanding but expensive." Again financial issue act as a barrier in excelling academically in STREAM.

Undeniably, these pre-university students need support from numerous sources to thrive at STREAM based abilities. It was dicovered that lack of support is one of the challenge faced by the pre-university students as 32.61% of respondents strongly agreed and 19.57% agreed with this. Respondents PUS 2, PUS 3, PUS 4, PUS 6 shared that they need some technical support such as clearing paper jam in printer, editting spelling and grammar in Microsoft Office while completing their assignments. Meanwhile, PUS 1, PUS 2, PUS 3, and PUS 5 indicated that it would relieve their financial burden if they could acquire some financial support such as "*biasiswa* (scholarship) or study allowance".

CONCLUSION

In conclusion, STREAM is a powerful and innovative approach to education that is helping to prepare students for the challenges of the future. STREAM provides students with a unique and engaging learning experience that encourages critical thinking, creativity and problem-solving by integrating Science, Technology, Religion, Engineering, Art and Mathematic in the present curriculum.

This study brought to light that the biggest hurdles faced by pre-university students in excelling in STREAM related disciplines are difficulty in scoring, financial restrictions, a lack of interest in the subjects offered in school, a lack of support, and the requirement to work part time. Identifying and comprehending these barriers would aid the school administrative and the Ministry of Education in working towards appropriate solutions to tailor excellence in STREAM related disciplines. This is vital to developing the country with STREAM based workers, ultimately fulfilling the challenges and demands of a STREAM driven economy.

The findings of this study had important implications for policymakers, school teachers, school counsellors and syllabus designers in considering the appropriate approach to attract more pre-university students to excel in STREAM based subjects in future.

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