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Factors Influencing the Choice of Higher Education Institution and Diploma Programme among Universiti Teknologi MARA (UiTM) Students

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ABSTRACT

Education based on Science, Technology, Engineering and Mathematics (STEM) plays a pivotal role in providing technically skilled human resources for the development of the nation. However, in Malaysia, the number of students taking STEM-related programmes in higher education institutions (HEI) is still low. The actual factors behind such scenario are still unclear and need to be further investigated. With better understanding on the influential factors, the relevant authority can come up with appropriate strategies to increase students' enrolment in STEM-related programmes. Thus, this study is embarked to determine the factors that influence the students' choice of HEI and diploma programme at Universiti Teknologi MARA (UiTM). A quantitative approach was employed by disseminating a questionnaire to 779 diploma students from Semester 1 and Semester 2 of April – August 2022 session. The quantitative data analysis methods used in this study includes descriptive statistics. The findings showed that people who influence the choice of HEI among the students the

most are themselves (mean: 5.16, SD: 1.108), while in terms of the choice of HEI, the availability of the academic programme (mean: 5.17, SD:0.894) is the leading factor. The study also found that the choice of diploma programme among students is dominantly influenced by employment opportunities (mean: 5.01, SD:1.001). The overall research findings showed that the students themselves and the people who are close to them are significant factors in determining which HEI the students chose to pursue their studies. Future career prospect is one important factor that influences the choice of their academic programmes. It is also important to note that about 45.9% of students who took the STEM package in school, changed to a Non-STEM programme when pursuing their studies in HEI. This finding revealed that there is a high percentage of STEM students who changed their fields in higher education. The outcomes of this study could be beneficial to the Ministry of Education, Ministry of Higher Education, education departments, schools, and higher education institutions to take proper actions and devise strategies to increase the number of students taking STEM-related programmes in school and higher education.

Keywords: *higher education institution (HEI); diploma programme; Science, Technology, Engineering and Mathematics (STEM)*

INTRODUCTION

The sufficient availability of skilled human resources especially in Science, Technology, Engineering and Mathematics (STEM) is very crucial in the development of a nation to become a developed country. As reported by the Academy of Sciences Malaysia (2018), Malaysia needs one million STEM workers by the year 2020 and eight million workers with STEM skills by 2050. However, the percentage of upper secondary schools' students who opted for STEM subjects is declining year by year to the extent that it has become challenging to fulfill the enrolment for the STEM academic programmes in HEIs. According to the Academy of Sciences Malaysia (2018) and Ministry of Education (2020), the enrolment of students in Science stream shows a declining trend (45.74% in 2017; 44.36% in 2018; 43.47% in 2019). These statistics are alarming since it is far away from the set target of 60:40 Science: Art Policy. This scenario is not favourable to the current initiatives by the government to increase more students taking STEM-based courses in HEIs.

Although various researchers have conducted numerous studies to identify the factors affecting the students in choosing HEI in Malaysia (Sia, 2010; Diana, 2013; Osman et al., 2013; Yusof et al., 2008), studies focusing specifically on factors influencing the students' choice of STEM and non-STEM academic programme are still very limited. Studying these factors is very imperative as it can enable better strategic actions to be taken by the authorities such as the Ministry of Education (MoE), Ministry of Higher Education (MoHE), education departments, schools, and HEI to increase the number of students taking STEM-related programmes at schools and HEIs. The findings of this study could also help the school personnel, HEI administrators, as well as parents to guide the students towards the right decision which suits their personalities, goals, and talents. Thus, this study is carried out to investigate the factors that influence the students' choice of HEI and diploma programme, particularly at University Teknologi MARA (UiTM).

This paper covers some background issues of the intended study under literature review section followed by the description of the methodology used in the study. The findings of the study are then explained and discussed thoroughly to indicate the attainment of the study objectives.

LITERATURE REVIEW

Background of Study

STEM education is important in supporting Malaysia's goal to achieve the status of a fully developed nation. Various policies have been introduced in Malaysia including the National Science and Technology Policy by the Ministry of Science, Technology and Innovation (MOSTI), which highlights the need to achieve a 60:40 ratio of which 60 percent of students major in STEM. Although the target has yet been met due to various factors such as limited awareness about STEM, perceived difficulty of STEM subjects, content-heavy of STEM curriculum, inconsistent quality of teaching and learning, and limited and outdated infrastructure (Ministry of Education, 2011), Malaysia is still optimistic and has continuously put significant efforts to achieve this 60:40 policy to ensure that the country has an adequate supply of talent pool in STEM.

Starting in 2020, MoE has implemented new subject packages for students entering Form Four, to replace the abolished science and arts streams. There are two main packages – STEM (Option A, B, C) and Arts and Humanities (Option A), which allow the students to choose the packages and elective subjects based on their interest, taking into account student achievement in the Form 3 Assessment (PT3), Classroom Based Assessment (PBD) and their psychometric test results. These packages are built on the need for students to connect with tertiary education as well as the students' future career pathway (Ministry of Education, 2019).

According to the Malaysia Blueprint 2013-2025 Annual Reports, the percentage of upper secondary students who enrolled in STEM in year 2018 was 44.36% and slightly dropped at 43.47% in 2019 (Ministry of Education, 2020). However, in 2020, when new STEM packages were first introduced, the percentage was slightly increased to 47.18% (172124 students) with 20.51% involving Pure Science, while the remaining 26.67% was for Technical and Vocational Education and Training (TVET) (Ministry of Education, 2021). These statistics are alarming as it is still far behind the targeted 60%.

With regards to tertiary education, students are given the chance to choose either to pursue a STEM or non-STEM academic programme, based on their *Sijil Pelajaran Malaysia* (SPM) results. SPM or the Malaysian Certificate of Education is a national examination taken by Form Five students of the Malaysian National Curriculum. The examination is set and examined by the Malaysia Examination Board. Achieving good SPM results is important in securing a place in HEIs. According to the Malaysian Qualification Agency (2014), a minimum of three credits in SPM is needed for diploma studies, otherwise students will need to start from the certificate level.

The low percentage of STEM students in high schools and the tendency of STEM students to choose non-STEM courses when entering HEIs results in quotas for most STEM-related programmes in universities to be unfulfilled. This has hampered efforts to produce more STEM talents needed for the country's development. Thus, it is very important to study the factors influencing the students' choice of HEIs and programmes as their choice can help steer the students towards their future career direction.

Related Studies

Numerous studies have reported 'who' (Sarkodie et al., 2020; Briones & Bueno, 2019; Pascual, 2014; Johnston, 2010; Garwe, 2016; Beswick, 1989; Chapman, 1981; etc) and 'what' (Sarkodie et al., 2020; Briones & Bueno, 2019; Sia, 2010; Osman et al., 2013, Diana, 2013; Garwe, 2016; Beswick, 1989; Chapman, 1981; etc) have influenced the students' choice of HEI and academic programme. 'Who' refers to the group of people who influence the students in making the decision which includes parents, families, friends/peers, teachers, and school counselors. Meanwhile, 'what' refers to the factors that influence the students in making the decision which include the reputation and location of the HEI, availability of academic programmes and financial support, facilities, academic qualification, etc. Many influential factors associated with the students' choice have been discussed widely in past studies. However, there were differences in the findings due to different contexts and approaches. Some factors are related to the influence exerted by the surrounding people, some are related to personal factors and others are related to institutional factors. Table 1 displays the list of factors included in this study based on the selected 4 past studies. These references were considered in this study as we seek to identify the significant factors from 80s to 20s that remain relevant and widely discussed in recent studies.

Chapman (1981) presented 'A model of student college choice' which provides a framework of the interrelationship between external influences and student characteristics and how those relationships affected the student's choice of HEI. The external influences include: (a) significant persons – parents, friends, high school personnel; (b) fixed characteristics of the institution – financial aid, location, availability of programme; and (c) institution's efforts to communicate with prospective students. The student characteristics include: (a) level of educational aspiration, (b) the high school performance, (c) the socio-economic status (SES), and (d) aptitude. For instance, the model provides an insight into how a student chooses the HEI in general.

Beswick (1989) studied the factors associated with the student choice process, by adapting the "Three Phase Model of College Choice" developed by Hossler and Gallagher (1987). This model consists of 3 phases: (1) the aptitude at which the person decides to go for HEI, (II) the

search in which a person begins to search for information about the HEI and narrow down the alternatives, and (III) the choice in which the person evaluates the alternatives and decides which HEI to attend (Polat & Celik, 2022). The factors include most factors discussed in Chapman (1981) and additional few factors as stated in Table 1.

Table 1
Selection of influential individuals and factors

Literature	Chapman (1981)	Beswick (1989)	Sia (2010)	Briones, & Bueno (2019)	Sarkodie et al. (2020)
People's Influence					
Parents	√	√		√	√
Friends/Peers	√	√		√	√
Teachers	√	√		√	√
School counselors	√	√			
Relatives/Siblings		√		√	
Oneself				√	√
Social media influencers					√
Influential factors to students' choice of HEI					
Programmes/ Courses offered	√	√	√	√	√
Location of the institution	√	√	√	√	
Financial support	√	√	√		√
Reputation of the institution		√	√	√	√
Educational and sports facilities			√		√
Institution's learning environment				√	
Institution's effort to communicate	√		√		√
Institution's advertisement		√	√		
Family tradition		√			
Influential factors to students' choice of programme					
Employment opportunities			√		√
Academic qualification	√	√			√
Career desire					√
Personal interest					√
Personal expectation	√				√
Recognition of programme		√			√
Family business					√

Sia (2010) developed a conceptual framework mainly to explore the institutional factors that influence students' college choice decision in Malaysia. The institution factors include the location, academic programme, institutional reputation, educational facilities, cost, availability of financial aid, employment opportunities, advertising, HEI representatives and campus visit.

Briones and Bueno (2019) as well as Sarkodie et al. (2020) studied factors influencing the students' choice of HEI and programme of study. The findings from these 2 studies are recent and vital as many of the existing literature focuses on factors influencing the students' choice of institution but much less on factors influencing students' choice of the specific programme of study.

Conceptual Model

Figure 1
General conceptual model of students' choice of higher education institution and diploma programme

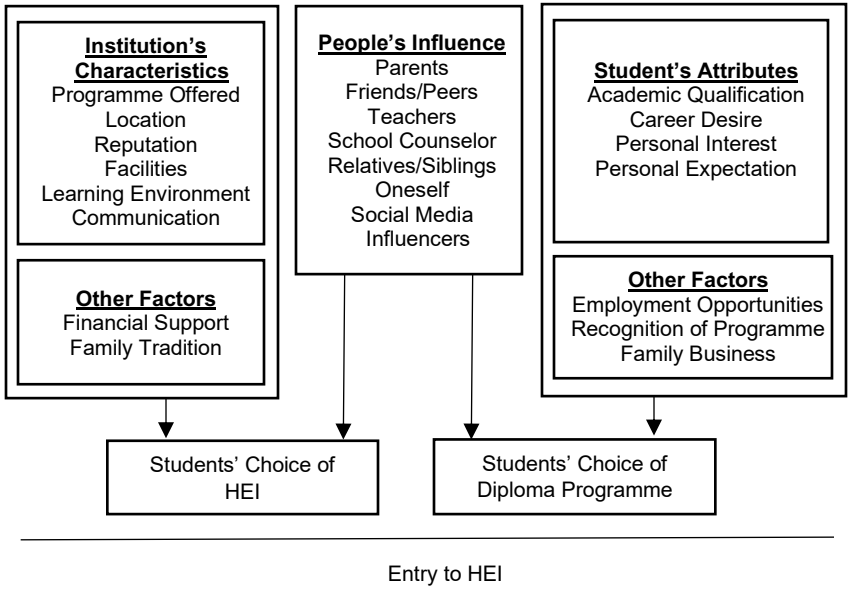

Figure 1 presents a general conceptual model of students' choice of higher education institution and diploma programme that specifies the important variable sets and their interrelationship, based on the summarized factors stated in Table 1.

The model suggests 4 sets of factors that influencing students' choice of higher education institution and diploma programme, namely the people's influence, institution's characteristics, student's attributes and other factors. This model was used as the basis of this study as it accommodates an extensive variety of significant factors.

METHODOLOGY

Quantitative data were collected via a google form questionnaire to gather the responses. The main focus of the questionnaire is to establish the relationship between the factors and the decision being made. The questionnaire was then divided into 4 sections and developed based on the factors identified from the literature reviews. Table 2 shows the description of each section, number of items, variables, and the sources where items were adapted. The mapping of the selected variables was done based on the conceptual model shown in Figure 1.

Each student was asked to indicate (on a scale of 1–Strongly Disagree to 6–Strongly Agree) to all items in each section, except section A. A 6-point Likert scale was employed to avoid the neutral option and thus encouraged respondents to make a choice that was either leaning toward positive or negative. This will increase the rate and quality of the responses.

To determine the feasibility of the research design, a pilot test was conducted on 94 diploma students from 3 branches of UiTM Sarawak campus. The necessary modifications, changes, and corrections were done to ensure ease of understanding and clarification of all items in the questionnaire.

The reliability test of the domain was examined using Cronbach's Alpha which ranges in value from 0 to 1. As shown in Table 3, the reliability coefficients for all domains ranged between 0.821 to 0.887, suggesting strong internal consistency reliability for all domains.

Table 2
Description of sections in google form questionnaire

Section	Description	No. of Items	Variables	Adapted From
A Profile	To generate the respondents' profile	6	Gender; State of origin, Campus; Programme; Family income household; SPM subject package.	Self-developed
B Influential people	To identify the people that may have influenced the respondents in making a choice of HEI/ programme to attend.	7	Parents; Friends/Peers; Teachers; School Counselor; Relatives/ Siblings; Oneself; Social Media Influencers;	Sarkodie et al. (2020); Briones & Bueno (2019); Beswick (1989); Chapman (1981)
C Influential factors to students' choice of HEI	To identify the factors that the respondents may have considered when making a choice of the HEI to attend.	9	Programme offered; Location; Reputation; Financial support; Facilities; Environment; Institution's effort; Advertisement; Family tradition;	Sarkodie et al. (2020); Briones, & Bueno (2019); Sia (2010); Beswick (1989); Chapman (1981)
D Influential factors to students' choice of programme	To identify the factors that the respondents may have considered when making a choice of the programme to attend.	8	Recognition; Employment; Career desire; Academic qualification; Personal interest; Personal expectation; Family business, Recommendation.	Sarkodie et al. (2020); Sia (2010); Beswick (1989); Chapman (1981)

Table 3
Cronbach's alpha of all domains

Domain	No. of Items	N	Mean	SD	Cronbach's Alpha
Influence of people on Student's Decision	7	774	31.08	7.228	0.873
Influencing Factors to Students' Choice of HEI	9	774	41.95	7.384	0.887
Influencing Factors to Students' Choice of Programme	8	774	37.63	5.519	0.821

The total number of targeted sample group is about 20,000 students and the total number of respondents of around 377 students are deemed appropriate for this study. This is based on Krejcie and Morgan (1970) table of sample size determination.

The students' sample was purposely selected from the first year students of diploma programme. Such sample frame is chosen as the students are deemed to be still new and fresh as well as having recent awareness and realization of their choice of HEI and academic programmes. Hence, the questionnaires were disseminated to the Semester 1 and Semester 2 Diploma students for semester April – August 2022 at Universiti Teknologi MARA (UiTM). A copy of the questionnaire, which has been approved by the UiTM Research Ethics Committee is available in the following link: https://drive.google.com/file/d/1zNQzJPiqdQLd3fgM-rvgK30CUpiKpnW9/view?usp=share_link

The data was analysed using descriptive statistics. The calculation was presented based on percentage, frequency, mean and standard deviation.

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RESULTS AND DISCUSSION

Respondents' Profiles

A total of 779 undergraduate students from Universiti Teknologi MARA (UiTM) from all over Malaysia participated in this survey. However, responses from 5 respondents were rejected as they were not from diploma programmes. The data were collected via a google form, which was disseminated to the diploma students from Semester 1 and Semester 2 of April – August 2022 session. Table 4 shows the demographic profiles of the respondents.

As illustrated in Table 4, 548 (70.8%) of the respondents are females, and the remaining 226 (29.2%) are males. The respondents' origin has a 50:50 distribution from West Malaysia and East Malaysia respectively. With regards to the campus of study, 397 (51.3%) of the respondents are from Sarawak campus, while 377 (48.7%) are from other campuses in West Malaysia. As in terms of faculty, 185 (23.9%) of the respondents are from Business and Management, 97 (12.5%) are from Accountancy, 92 (11.9%) are from Computer Sciences and 79 (10.2%) are from Architecture, Planning and Surveying.

In terms of family income, 462 (59.7%) of the respondents are from the B40 group family whose total monthly income per household is less than RM4850 (Department of Statistics Malaysia, 2020). On the other hand, 252 (32.6%) of the respondents are from the M40 group whereas 60 (7.8%) are from the T20 group.

With regards to the subject package taken by the respondents for their SPM, 408 (52.7%) of the respondents were from the Arts and Humanities Package while the remaining 366 (47.3%) were from the STEM Package.

Table 4
Profiles of the respondents

Profiles	Total
Gender (n=774)	
Female	548 (70.8%)
Male	226 (29.2%)
Area of Origin (n=774)	
West Malaysia	387 (50.0%)
East Malaysia	387 (50.0%)
Campus of Study (n=774)	
Sarawak	397 (51.3%)
Negeri Sembilan	106 (13.7%)
Perak	88 (11.4%)
Kedah	77 (9.9%)
Johor	55 (7.1%)
Terengganu	31 (4.0%)
Pahang	20 (2.6%)
Diploma Programme (n=774)	
Business and Management	185 (23.9%)
Accountancy	97 (12.5%)
Computer Sciences	92 (11.9%)
Architecture, Planning and Surveying	79 (10.2%)
Information Management	60 (7.8%)
Public Administration	56 (7.2%)
Plantation and Agrotechnology	49 (6.3%)
Applied Sciences	34 (4.4%)
Engineering	30 (3.9%)
Communication and Media	25 (3.2%)
Language Studies	24 (3.1%)
Art and Design	18 (2.3%)
Sports Science and Recreation	16 (2.1%)
Islamic Studies	8 (1.0%)
Hotel and Tourism	1 (0.1%)
Family Income Household (n=774)	
Less than RM4850 (B40)	462 (59.7%)
RM4850 to less than RM10959 (M40)	252 (32.6%)
RM10960 or more (T20)	60 (7.8%)
SPM Subject Package (n=774)	
Arts and Humanities (non-STEM)	408 (52.7%)
Science, Technology, Engineering and Mathematics (STEM)	366 (47.3%)

Influence of People

Table 5 presents the feedback from 774 respondents on the person who has influenced them in making the choice of the institution or diploma programme to attend. The results show that the top four are oneself (M=5.17; SD=1.108), parents (M=4.98; SD=1.222), relatives/siblings (M=4.41; SD=1.451), and friends (M=4.24; SD=1.410).

Table 5
People who have influenced the students' choice of HEU and diploma programme

Items	6-Point Likert Scale						Mean	SD
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree		
Oneself	17 (2.2%)	14 (1.8%)	28 (3.6%)	81 (10.5%)	253 (32.7%)	381 (49.2%)	5.17	1.108
Parents	23 (3.0%)	29 (3.7%)	24 (3.1%)	109 (14.1%)	269 (34.8%)	320 (41.3%)	4.98	1.222
Relatives/ Siblings	56 (7.2%)	55 (7.1%)	45 (5.8%)	148 (19.1%)	296 (38.2%)	174 (22.5%)	4.41	1.451
Friends	56 (7.2%)	60 (7.8%)	65 (8.4%)	172 (22.2%)	304 (39.3%)	117 (15.1%)	4.24	1.410
Teachers	61 (7.9%)	65 (8.4%)	71 (9.2%)	173 (22.4%)	280 (36.2%)	124 (16.0%)	4.19	1.452
Social Media Influencers	58 (7.5%)	56 (7.2%)	72 (9.3%)	183 (23.6%)	307 (39.7%)	98 (12.7%)	4.19	1.388
Community	66 (8.5%)	78 (10.1%)	82 (10.6%)	199 (25.7%)	267 (34.5%)	82 (10.6%)	3.99	1.431
School Counselors	80 (10.3%)	88 (11.4%)	96 (12.4%)	172 (22.2%)	240 (31.0%)	98 (12.7%)	3.90	1.523
Idols	112 (14.5%)	92 (11.9%)	98 (12.7%)	174 (22.7%)	215 (27.8%)	83 (10.7%)	3.69	1.588

The finding revealed that most students chose their HEI or programme of study according to their own choices. This finding is consistent with Briones and Bueno (2019) who stated that it was the students' personal choice to enroll in their chosen school and degree

programme. Similarly, a study by Pascual (2014) found that the students' course preference was not much affected by the decision of others.

Likewise, the person who influenced the students the most are those closest to them in their daily life i.e., the family members and the friends they lingered with. The result is consistent with Hoyer and MacInnis (2007) who reported that the reference group with direct and extensive contact tends to exert the greatest influence. The result is also supported by Johnston (2010) who indicated that parents, along with other family and friends, were the most influential sources of information on students' choice of university. According to Yamamoto (2006), most students made their university selection based on their own decisions and those affected by external and situational factors, parental influence had a high impact on students' choice. Garwe (2016) reported influences from families, teachers, friends, and peers contributed to factors of decision making to enroll in HEI.

Other Influential Factors

The following two tables present the findings from 774 respondents on the factors influencing their choices of HEI (Table 6) and diploma programmes (Table 7). Based on the mean values reported in Table 6, programmes or courses offered (M=5.16, SD=.894) was the most influential factor that contributed to the students' choice of HEI. The finding is in line with Osman et al. (2013) who highlighted that the programmes offered in a particular higher education institution is said to be the main contributing factor in determining the choice of student enrolment.

This is followed by the institution's learning environment (M=4.89, SD=1.006), financial support (M=4.88, SD=1.031), the reputation of the institution (M=4.82, SD=1.031), location of the institution (M=4.75, SD=1.235) and educational and sports facilities (M=4.62, SD=1.079). Institution advertisement (M=4.38, SD=1.185) and family tradition (M=3.90, SD=1.454) were the least influential factors to the student's choice of HEI.

The findings are consistent with other studies which reported the availability of required programmes or courses as the important factor in the selection of HEI (Sia, 2010; Rohaizat, 2004; Nagaraj et al., 2008; Yusof et al., 2008). Sia (2010) also indicated that other institutional factors such as

reputation, location and facilities were crucial in the students' selection of HEI in Malaysia. Similarly, findings from international studies show that the institution's good image (Bourke, 2000; Gutman & Miaoulis, 2003) as well as the location (Shanka et al., 2005, Garwe, 2016) can strongly affect students' preferences. According to Garwe (2016), students may prefer to study in an institution that is close to their hometown to save on the cost of transportation.

Table 6
Factors influencing the students' choice of HEI

Items	6-Point Likert Scale						Mean	SD
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree		
Programmes / Courses offered	8 (1.0%)	5 (0.6%)	16 (2.1%)	100 (12.9%)	346 (44.7%)	299 (38.6%)	5.16	.894
Institution's learning environment	12 (1.6%)	15 (1.9%)	32 (4.1%)	131 (16.9%)	379 (49.0%)	205 (26.5%)	4.89	1.006
Financial support	11 (1.4%)	15 (1.9%)	45 (5.8%)	129 (16.7%)	361 (46.6%)	213 (27.5%)	4.88	1.031
Reputation of the institution	12 (1.6%)	24 (3.1%)	38 (4.9%)	135 (17.4%)	370 (47.8%)	195 (25.2%)	4.82	1.059
Location of the institution	23 (3.0%)	34 (4.4%)	49 (6.3%)	125 (16.1%)	314 (40.6%)	229 (29.6%)	4.75	1.235
Educational and sports facilities	15 (1.9%)	23 (3.0%)	57 (7.4%)	192 (24.8%)	344 (44.4%)	143 (18.5%)	4.62	1.079
Institution's effort to communicate with the public	24 (3.1%)	28 (3.6%)	64 (8.3%)	174 (22.5%)	357 (46.1%)	127 (16.4%)	4.54	1.154
Institution's advertisement	26 (3.4%)	41 (5.3%)	79 (10.2%)	187 (24.2%)	348 (45.0%)	93 (12.0%)	4.38	1.185
Family tradition	72 (9.3%)	71 (9.2%)	131 (16.9%)	173 (22.4%)	243 (31.4%)	84 (10.9%)	3.90	1.454

Additionally, financial support also plays an important role in the student's selection. According to Hayden (2010), financial aid has been a priority compared to other factors. Yusof et al. (2008) reported the financial assistance offered by the university as one of the important attributes

expected from a particular HEI of choice. A study by Diana (2013) revealed that respondents chose UiTM to further their studies due to the cheaper enrolment fees as compared to other government or private HEIs. Foskett, Maringe and Roberts (2006) found that flexibility of fee payment, availability of financial aid, and reasonable accommodation costs exert a significant influence on students' choice of a higher education institution.

On the other hand, as shown in Table 7, employment opportunities (M=5.01, SD=1.001) was the most influential factor that contributed to the students' choice of the diploma programme. This was followed by the academic qualification (M=4.99, SD=1.104), career desire (M=4.98, SD=1.075), personal interest (M=4.95, SD=1.104), personal expectation (M=4.86, SD=1.040) and recognition of programme (M=4.75, SD=1.055). Recommendations by people as discussed in Table 4 (M=3.87, SD=1.459) and family business (M=3.58, SD=1.428) were the least influential factors in the student's choice of the diploma programme.

Table 7
Factors influencing the students' choice of the diploma programme

Items	6-Point Likert Scale						Mean	SD
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree		
Employment opportunities	13 (1.7%)	12 (1.6%)	23 (3.0%)	112 (14.5%)	360 (46.5%)	254 (32.8%)	5.01	1.001
Academic qualification	11 (1.4%)	12 (1.6%)	21 (2.7%)	111 (14.3%)	392 (50.6%)	227 (29.3%)	4.99	1.104
Career desire	15 (1.9%)	12 (1.6%)	33 (4.3%)	134 (17.3%)	300 (38.8%)	280 (36.2%)	4.98	1.075
Personal interest	17 (2.2%)	18 (2.3%)	29 (3.7%)	127 (16.4%)	316 (40.8%)	267 (34.5%)	4.95	1.104
Personal expectation	14 (1.8%)	14 (1.8%)	32 (4.1%)	160 (20.7%)	341 (44.1%)	213 (27.5%)	4.86	1.040
Recognition of programme	14 (1.8%)	22 (2.8%)	44 (5.7%)	147 (19.0%)	383 (49.5%)	164 (21.2%)	4.75	1.055
Recommendation by influencers (as in Table 5)	73 (9.4%)	81 (10.5%)	118 (15.2%)	183 (23.6%)	239 (30.9%)	80 (10.3%)	3.87	1.459
Family business	85 (11.0%)	96 (12.4%)	166 (21.4%)	194 (25.1%)	178 (23.0%)	55 (7.1%)	3.58	1.428

STEM and Non-STEM vs S&T and Non-S&T

In Universiti Teknologi MARA (UiTM), the faculties are grouped under three clusters of knowledge namely Science & Technology; Social Sciences & Humanities and Business & Management (see Table 8).

Table 8
Faculties in UiTM according to clusters

Science & Technology (S&T)	Social Sciences & Humanities	Business & Management
Faculty of Medicine	Faculty of Administrative Science and Policy Studies	Faculty of Business and Management
Faculty of Pharmacy	Faculty of Art and Design	Arshad Ayub Graduate Business School
Faculty of Dentistry	Faculty of Communication and Media Studies	Faculty of Accountancy
Faculty of Health Science	Faculty of Education	Accounting Research Institute
School of Civil Engineering	Faculty of Film, Theatre and Animation	Faculty of Information Management
School of Chemical Engineering	Faculty of Law	Faculty of Hotel & Tourism Management
School of Electrical Engineering	Faculty of Music	
School of Mechanical Engineering	Academy of Contemporary Islamic Studies	
Faculty of Architecture, Planning and Surveying	Academy of Language Studies	
Faculty of Applied Science		
Faculty of Computer & Mathematical Sciences		
Faculty of Sports Science & Recreation		
Faculty of Plantation and Agrotechnology		

Source: http://study.uitm.edu.my

In 2018, the total number of academic programmes offered in UiTM was 508, where 281 programmes were from Science and Technology (S&T) cluster and the remaining 227 programmes were from non-S&T clusters, i.e. Social Sciences & Humanities and Business & Management (see Table 9).

Table 9
Academic Programme in UiTM according to S&T and non-S&T

Academic Programme	Total
S&T	281
Non-S&T	227
Total	508

Source: https://korporat.uitm.edu.my/images/Document/2018/ProfileUiTM2018.pdf

As shown in Table 10, 54.1% of the respondents who enrolled in the SPM STEM package in upper secondary school have chosen the diploma programme in Science and Technology (S&T) while the remaining 45.9% chose the non-S&T academic programme. On the other hand, 75.0% of the respondents who enrolled in the SPM non-STEM package have chosen the non-S&T diploma programme. However, 25.0% of them chose the S&T academic programme.

Table 10
STEM and Non-STEM vs S&T and Non-S&T

SPM Subject Package	Academic Program		Total
	S&T	Non-S&T	
STEM	198 (54.1%)	168 (45.9%)	366
Non-STEM (Art And Humanities)	102 (25.0%)	306 (75.0%)	408

The above finding indicates that not all students who took the SPM STEM package chose the STEM-related programme for their diploma studies. Further analysis on gender (Table 11) shows that female students contribute a higher percentage (48.4%) in choosing the Non-S&T instead of the S&T programme, as compared to male students (39.8%).

Table 11
STEM and Non-STEM vs S&T and Non-S&T

SPM STEM Package	Academic Program		Total
	S&T	Non-S&T	
Male	65 (60.2%)	43 (39.8%)	108
Female	133 (51.6%)	125 (48.4%)	258

CONCLUSION

The findings revealed that most students chose their HEI or programme of study according to their own choices. However, people who are close to them do have a certain significant influence on their choices. In addition, the inward characteristic of the HEI itself, for instance the academic programmes that are offered, is also a crucial factor. In terms of the academic programme, apparently employment opportunities are indeed the dominant factor while making their choice.

The findings also revealed that not all students who took the SPM STEM package chose the STEM-related programme for their diploma studies. Further analysis on gender showed that the percentage of female students who chose the Non-S&T was higher than their male counterparts. We suggest that future studies can be conducted to further investigate and discuss this matter. On top of that, enhancing students' enjoyment, interest, and perceptions of their ability in STEM, as well as increasing student perceptions of its value in a future career, may result in more students taking the STEM-related programme in HEI.

The findings provide significant and useful ground information to the authorities such as the Ministry of Education (MoE), Ministry of Higher Education (MoHE), education departments, schools, and higher education institutions to assist them in a proper strategy for promotion while taking necessary action to increase the number of students taking STEM-related programmes at schools and HEI. The findings of this study could also help the school personnel, HEI administrators, as well as parents to guide the students towards the right decision which suits their personalities, goals, and talents.

CONTRIBUTIONS OF AUTHORS

The authors confirm equal contribution in each part of this work. All authors reviewed and approved the final version of this work.

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CONFLICT OF INTEREST

All authors declare that they have no conflicts of interest.

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REFERENCES

Academy of Sciences Malaysia (2018). *Science outlook 2017: Converging towards progressive Malaysia 2050*. Kuala Lumpur, Malaysia: Academy of Sciences Malaysia.

Briones, E. R., & Bueno, D. C. (2019). Factors affecting the decision of first-year students in choosing their degree program and school. *Institutional Multidisciplinary Research and Development Journal, 2*, 130–135. https://doi.org/10.13140/RG.2.2.25060.01921

Beswick, R. L. K. (1989). A study of factors associated with student choice in the HEI selection process (Unpublished master thesis). *The HEI of Lethbridge*. https://core.ac.uk/download/pdf/185289834.pdf

Bourke, A. (2000). A Model of the determinants of international trade in higher education. *The Service Industries Journal, 20*(1), 110–138. https://doi.org/10.1080/02642060000000007

Chapman, D. (1981). A model of student college choice. *Journal of Higher Education*, *52*(5), 490–505. http://www.jstor.org/stable/1981837

Department of Statistics Malaysia (2020). Household Income and Basic Amenities Survey Report 2019. https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=120&bul_id=TU00TmRhQ1N5TUxHVWN0T2VjbXJYZz09&menu_id=amVoWU54UTl0a21NWmdhMjFMMWcyZz09

Diana, F. (2013). Factors in selection of a Malaysian HEI. *2013 IEEE Business Engineering and Industrial Applications Colloquium (BEIAC)*, Langkawi, Malaysia, 399–403. https://doi.org/10.1109/BEIAC.2013.6560157.

Foskett, N., Maringe, F., & Roberts, D. (2006). Changing fee regimes and their impact on student attitude to higher education. *Higher Education Academy UK, 22*(2), 23–31. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.128.2787&rep=rep1&type=pdf.

Garwe, E.C. (2016). "Increase in the demand for private higher education: unmasking the "paradox"". *International Journal of Educational Management*,*30*, 232–251. http://doi.org/10.1108/IJEM-05-2014-0064.

Gutman, J., & Miaoulis, G. (2003). Communicating a quality position in service delivery: An application in higher education. *Managing Service Quality, 13*(2), 105–111.

Hayden, M. L. (2010). Factors That Influence the College Choice Process for African American Students. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=f626bfd205ec02b2db6db3b00316aab00712eb0d

Hossler, D., & Gallagher, K. S. (1987). Studying student college choice: A three-phase model and the implications for policymakers. College and HEI, 62(3), 207–221. http://www.aacrao.org/publications/candu/index.cfm

Hoyer, W. D. & MacInnis, D. J. (2007). *Consumer Behavior*, 4th ed. Boston: Houghton Mifflin Co.

Johnston, T. C. (2010). Who and what influences choice of HEI? Student and HEI perceptions. *American Journal of Business Education (AJBE), 3*(10), 15–24. https://doi.org/10.19030/ajbe.v3i10.484.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610.

Malaysian Qualification Agency (2014). *Education Programme Standards*. https://www2.mqa.gov.my/qad/garispanduan/Education%20Program%20Standard%20(EPS).pdf

Ministry of Education (2019). Surat Pekeliling Ikhtisas KPM Bilangan 6 tahun 2019: *Perlaksanaan Kurikulum Standard Sekolah Menengah (Menengah Atas) dan Pakej Mata Pelajaran mulai tahun 2020.* https://www.moe.gov.my/muat-turun/pekeliling-dan-garis-panduan/ikhtisas/2019

Ministry of Education (2011). *Malaysia Education Blueprint 2013-2025*. https://www.MoE.gov.my/menumedia/media-cetak/penerbitan/dasar/1207-malaysia-education-blueprint-2013-2025/file

Ministry of Education (2020). Pelan Pembangunan Pendidikan Malaysia 2013-2025: *Laporan Tahunan 2019*. https://www.padu.edu.my/annual_report/2019/

Ministry of Education (2021). Pelan Pembangunan Pendidikan Malaysia 2013-2025: *Laporan Tahunan 2020*. https://www.padu.edu.my/annual_report/2020/

Nagaraj, S., Munisamy, S., Mohd Jaafar, N. I., Abdul Wahab, D., & Mirzaei, T. (2008). How do undergraduates choose their HEI? A study of first year HEI of Malaya Students. *FEA Working Paper Series 2008*-8. Kuala Lumpur: Faculty of Economics and Administration, HEI of Malaya.

Osman, M. Z., Muhammad,T. J. & Andy, B. I. (2013). Factors Influencing Students' Decisions in Choosing Private Institutions of Higher Education In Malaysia: A Structural Equation Modelling Approach. *Asian Academy of Management Journal,* 18, 1, 75–90.

Pascual, N. (2014). Factors affecting high school students' career preference: A basis for career planning program. *International Journal of Sciences: Basic and Applied Research, 16*(1), 1–14. http://gssrr.org/index.php?journal=journalofbasicandapplied

Polat, S., & Celik, C. (2022). HEI websites: Attractive or casual? Higher Education Governance & Policy, 3(1), 16–28. https://doi.org/10.55993/hegp.1079380

Rohaizat, B. (2004). Identifying needs and wants of HEI students in Malaysia. *Malaysian Management Review 39*(2), 59–64. http://lib.perdana.org.my/PLF/Digital_Content/Journal&Papers/00001/4/MMR/%5BVol.39%5D%5BNo.2%5D%5BDec%202004%5D/%5B59-65%5D.pdf

Sarkodie, N. A., Asare, A., & Asare, D. (2020). Factors Influencing Students' Choice of Tertiary Education. *ADRRI Journal*, *28*(11(5)), 58–92. https://doi.org/10.55058/adrrij.v28i11(5).518

Shanka, T., Quintal, V., & Taylor, R. (2005). Factors influencing international students' choice of education destination: A correspondence analysis. *Journal of Marketing for Higher Education 15*(2), 31–46. https://doi.org/10.1300/J050v15n02_02

Sia, J.K.M. (2010). Institutional Factors Influencing Students' College Choice Decision in Malaysia: A Conceptual Framework. International Journal of Business and Social Science. *1*(3), 53–58. http://www.ijbssnet.com/journals/Vol._1_No._3_December_2010/6.pdf.

Yamamoto, G. T. (2006). HEI evaluation-selection: A Turkish case. *International Journal of Educational Management*, *20*(7), 559–569. https://doi.org/10.1108/09513540610704654

Yusof, M., Ahmad, S. N. B., Tajudin, M. & Ravindran, R. (2008). A study of factors influencing the selection of a higher education institution. UNITAR e-journal, *4*(2), 27–40.