







# Does The Lack of Information and Guidance About Career Opportunities in the Science Field Cause Students to Lose Interest in Choosing This Stream?

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## ABSTRACT

A key issue in Malaysian education is the declining interest among students in pursuing the science stream, which has been linked to insufficient career information and guidance. This study investigates whether the lack of career information and guidance contributes to students losing interest in the science stream. Conducted among 30 Form 4 Science stream students in Johor Bahru, the research employed a quantitative survey to assess perceptions of career guidance, access to information, and its influence on interest in science-related careers. The findings reveal that while most students (83.3%) remain interested in pursuing science-related professions, inadequate career counselling leads to uncertainty and reduced confidence in making informed career decisions. Many students rely on the internet for career information, which may expose them to misinformation and further confusion. Although a lack of guidance does not directly diminish interest in science, it significantly affects students' self-assurance in choosing suitable science-based pathways. Respondents emphasized the importance of structured career counselling, career talks, and exposure to professionals in science fields. Such initiatives help clarify job scopes, required qualifications, and available opportunities, thus supporting better career planning. The study concludes that strengthening career guidance in schools is essential to ensure students are well-informed and motivated to pursue careers in science. Addressing this gap is crucial for Malaysia's efforts to boost STEM enrolment and develop a skilled workforce for future economic growth.

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## 1. Introduction

Recent advancements in technology are changing our world. The convergence of the cyber environment characterizes industry revolution 4.0, the Internet of Things (IoT), and advanced technologies are changing our lives, including our economy, industry, and work environment, creating new opportunities while presenting challenges for nations worldwide (Mustafa et al., 2021). To remain competitive in this digital era, a workforce trained in Science, Technology, Engineering, and Mathematics (STEM) is essential (Tey et al., 2019).

Since the 1980s, Malaysia has been trying to achieve a highly developed national status by emphasizing these elements. It was reported that Malaysia needed to train at least 1 million highly skilled STEM workers by 2020, with a projection of up to 8 million by 2050, to support the needs of growing industries such as biotechnology, renewable energy, artificial intelligence, and vice versa (The Academy of Sciences Malaysia, 2018). However, this aspiration was hampered by a chronic shortage of STEM talent due to a lack of interest among secondary students. According to Radhi and Sallehuddin (2024), 50.8% of students in Malaysia enrolled in STEM fields in 2024. Despite this improvement, the enrolment rate still falls short of the 60:40 policy introduced by the Malaysian Higher Education Planning Committee in 1967. This policy aimed to address the growing demand for science graduates by mandating that 60% of students pursue Science or Technical streams, while the remaining 40% enroll in Arts (Ministry of Education, 2012). The relatively low participation in STEM fields may contribute to an insufficient number of workers in STEM sectors and hence hinder the country's ability to meet the demands of its evolving industries.

One contributing factor to this shortfall is the need for more awareness and guidance regarding the diverse and exciting career opportunities in science. Without clear information about science education, students may perceive science as overly challenging and cannot imagine its real-world application and career paths. For example, many students claim that they are unaware of the career fairs or receive minimal guidance from school counsellors (Elias et al., 2023). The lack of professional career counselling is associated with students feeling unprepared and uncertain about their career paths. This uncertainty has been linked to a reduced interest in science-related fields (R. Ali & Shafiq, 2019). Besides, without adequate support, students struggle with self-awareness of their interests and skills. This might affect students' choices and hinder interest in pursuing careers in the science field (J. O. Boye et al., 2023).

To address the growing demand for STEM professionals, especially in the science field, it is important to not only improve STEM education but also enhance career guidance for students. Therefore, this study aims to explore whether the lack of information and guidance about career opportunities in the science field causes students to lose interest in choosing this stream. The findings of this study highlight the potential for strengthening career awareness and support initiatives, which in turn could help students better recognize the value of pursuing science-related fields and contribute to Malaysia's efforts to build a future-ready workforce.

## 2. Objectives

Generally, this research is conducted to identify whether the lack of information and guidance about career opportunities in the science field causes students to lose interest in choosing this stream. In order to realize that purpose, the objective of this study is specific as follows:

1. To explore whether the lack of information and guidance about career opportunities in the science field causes students to lose interest in choosing the science stream.
2. To assess the influence of career information and guidance in the science field on students' interest in pursuing the science stream.

### 3. Literature Review

STEM refers to Science, Technology, Engineering and Mathematics. Interest and enrolment in STEM fields have been an important focus of the educational system globally since these fields can overcome workforce demands, fostering innovation and supporting economic growth (Sellami et al., 2022). STEM is essential in this era also due to its role in addressing critical global challenges such as climate change, food security and water scarcity which relate to environmental issues, health and energy. Therefore, it is important to cultivate and expand the field of STEM.

Looking at the global trend, there is some disparity in the STEM interest with the enrolment between the countries. Some of the countries' citizens show high support for STEM while some do not. The countries that show high engagement in the STEM field are China, Germany, Singapore, Finland and Sweden (Education in China and the World, 2024). These can be seen through the student enrolment in the STEM stream in middle school, the bachelor's degree and their enrolment in the STEM professions such as doctor, engineering, STEM teachers and architecture. For instance, the STEM enrolment for undergraduate students to the bachelor of degree in China hit 40% recently and became the top among 10 countries, then followed by Germany with 35% (Education in China and the World, 2024). The high enrolment in the STEM field during the university credits to the primary and secondary teachers who cultivate the love of STEM among the students.

However, high enrolment in STEM subjects during primary, secondary and tertiary education does not mean it will align with the enrolment of graduates in the STEM career. Finland, Germany and Taiwan saw a decline in students in the STEM field. Between 2011 to 2020, the number of students who enrolled in the STEM-related department decreased from 35.4% to 31.8% (Lee & Lee, 2022). To address this issue, many countries have reformed the policies and steps to emphasize STEM in formal and informal education. Some countries also focus on the STEM teachers' professional development to make STEM teaching more engaging and motivate students to explore deeply in this field. This shows that without effective strategies to sustain interest, initial enrolment in STEM does not guarantee long-term commitment to STEM careers.

The Malaysian government is aware of the importance of STEM education for the country's economic and social development. Therefore, a comprehensive plan to promote students' interest and careers in the STEM field was outlined in the Malaysia Education Blueprint 2012-2025 and the National STEM Transformation Plan in 2019 (Mahmud et al., 2022). The Ministry of Education increases the students' STEM interest by equipping them with the necessary skills and knowledge by addressing the misconception (Mahmud et al., 2022) and organizing more STEM activities such as the STEM carnival and Innovation Day. To align with the Fourth Industrial Revolution and Society 5.0, the government also focuses more on the collaboration of STEM teacher training with the industry so that teachers can train students who can encounter global economic challenges and be a high-quality STEM workforce (Foi & Kean, 2023). Despite these efforts, the current enrolment rate in Malaysia's science stream remains below the 60:40 target, raising concerns about whether students are receiving enough support and guidance to pursue science-related fields.

#### **3.1. Theoretical Framework of Career Education**

One of the most relevant frameworks for understanding students' career decisions making is the Social Cognitive Career Theory (SCCT), which was developed by Lent, Brown and Hackett in 1994 (Lent et al., 2017). There are three foundational factors in SCCT, which include self-efficacy beliefs, outcome expectations, and personal goals. These factors are playing important roles in shaping how students develop their career interests, make choices, and achieve success in their desired fields (Wang et al., 2022).

According to Lent and Brown (2019), SCCT has good applicability in school career education guidance and provides a comprehensive framework for explaining and predicting career development. Compared to other career theories, SCCT offers a new perspective on guiding adolescents' interest formation, career choice, and performance, with potential for cross-cultural research (Lent et al., 2013). This makes SCCT particularly relevant in diverse

educational contexts such as Malaysia, where students may face varying levels of access to information, guidance, and resources.

In the context of science-related careers, SCCT explains that the students are more likely to set goals and choose science-related careers if they can perform well in the science subjects (self-efficacy), and when they expect positive outcomes from pursuing such careers (Ye, 2021). Conversely, if students lack confidence in their abilities or are unaware of the opportunities available, their motivation to pursue the science stream may decline.

In addition, SCCT also emphasizes the role of contextual influences, such as access to career information, guidance, role models, and supportive school environments (Zola et al., 2022). Limited access to these resources can restrict students' exposure to science-related opportunities and thus shaping their career aspirations. This shows that career information and guidance are not only external support but also critical contextual factors in shaping students' self-efficacy, outcome expectations, and career decisions, which will be discussed in the following section.

### ***3.2. The Importance of Career Information and Guidance***

Career information and guidance play an important role in helping students explore various career options and understand the educational steps needed to achieve their goals (Davenport, 2024). According to Holt-White et al. (2022), students might face difficulties in choosing course combinations that are related to their interests and desired careers. Therefore, effective career guidance is important in addressing these challenges by equipping students with the knowledge, resources, and support they need to make well-informed decisions about their futures.

On the other hand, one of the platforms that provide students with career guidance and information is the school counselling service. According to Uche (2020), individual career counselling services have a substantial impact on students' adherence to school rules, their ability to adapt to the school environment, and their motivation to engage with learning. Such counselling helps students better understand the range of career opportunities available to them, enhancing their interest and participation in relevant academic subjects. However, the problem arises when such counselling is limited or unavailable, leaving many students without sufficient guidance to explore potential career pathways (Hussain et al., 2023). This lack of support may weaken their interest in related academic subjects and reduce their motivation to pursue them.

Josephat et al. (2024) also highlighted that the teacher-counselors who provide personalized support to their students can help students in creating tailored career plans. With the guidance, the students may develop their interest in specific fields like science. Therefore, the individualized interactions have been especially effective in guiding students toward science-related careers, offering them a structured pathway to achieve their goals and realize their potential. However, the problem is that not all schools have sufficient teacher-counsellors, and those available are often overburdened with teaching duties. As a result, many students do not receive individualized interactions that could guide them toward science-related careers.

### ***3.3. Impact of Insufficient Information and Guidance on Students' Career Decisions***

The lack of sufficient information and guidance can significantly influence students' ability to make informed decisions about careers in science. Ali and Shafiq (2019) emphasize that students who lack access to proper career counselling are often unaware of potential career options. As a result, they rely on informal sources such as teachers, friends, and family, which may not provide comprehensive or accurate guidance. This over-reliance on informal or incomplete sources can lead to misconceptions and reduce students' willingness to pursue science pathways.

J. O. Boye et al. (2023) found that high school seniors frequently struggle to decide on their future career paths due to limited access to structured career information and counselling. This aligns with the findings of Elias et al. (2023), where 100% of respondents identified the absence of career-related information as a primary barrier to achieving their desired career goals. A significant number of students revealed that they had never participated in or were even aware of career fairs designed to provide them with such information.

As career guidance and information from formal sources like school counsellors or career fairs are insufficient, students choose to find career information on the Internet (Elias et al., 2023). However, fake or outdated information might lead to inconsistencies or misconceptions. Boye et al. (2023) highlighted that a lack of accurate and detailed information can result in misunderstandings about job requirements, salary expectations, training pathways, and job security. Consequently, this will ultimately lead students to make poorly informed decisions about their careers.

### **3.4. Connection Between Career Guidance and Student Interest in Science**

Several career guidance strategies can help us to connect students' interests in the science field. These strategies not only help students enhance their understanding of potential career paths but also motivate them to choose the science stream. Drymiotou et al. (2021) mentioned that students' interest in science may increase if career-oriented curricula are included in science classrooms. Based on their results, the career-oriented curriculum can provide students with an active engagement through career-based scenarios. This not only helps the students to connect the discussions in the classroom and real-world settings but also helps them to apply scientific ideas to specific situations that are personally relevant to one's life. These opportunities enhance students' situational interest and understanding of the STEM career. According to Drymiotou et al. (2021), when students can relate scientific concepts to practical use and interact with experts in science, students express more interest in learning about science.

Besides, exposure to role models provides a lot of guidance and advice. This can inspire and motivate students to decide. Zhang et al. (2023) found that role models significantly influence students' interest in science. In their study, students interact with professionals working in related STEM fields during the career modelling sessions. Students are encouraged to discuss and ask professionals questions about career-related topics. Based on the result, students have a deep understanding of biotechnology and become more aware of the steps to accomplish their future career goals. Students' curiosity and motivation are enhanced when they observe successful individuals in the STEM field. This makes them imagine themselves following similar career paths. However, many students do not have regular exposure to science role models, which limits their ability to connect classroom learning with real-world career opportunities.

In summary, gaps in career counselling services, insufficient teacher-counsellors, limited access to accurate information, and the absence of role models contribute to students' declining interest in the science stream. These challenges highlight the urgent need to better understand how students perceive career information and guidance in relation to science. Therefore, this study explores students' perspectives on whether the lack of information and guidance about science-related careers leads to reduced interest in pursuing the science stream.

## **4. Problem Statement**

Nowadays, the demands of STEM professionals in Malaysia are increasing, especially in industries like biotechnology, renewable energy and artificial intelligence. This is due to the poor student participation in science-related fields that lead Malaysia to a shortage of professionals in the STEM field. The current STEM enrolment rate is 50.8%, which falls short of the goal despite the 60:40 policy's intention to increase science involvement. This causes Malaysia to face difficulties in developing the industrial and economic sectors. Several factors contribute to this shortfall. One of the factors is the lack of effective career information and guidance about opportunities in the science field. Many students have misunderstandings about science being too hard to study and it is not related to their aspirations. This is because they are not aware of the real-world application of science and the wide range of career options. Besides, insufficient school counselling services and a shortage of teacher-counsellors further restrict individualized support, while a lack of exposure to role models reduces students' motivation and interest in science subjects. Consequently, many students are uncertain about their academic and career pathways, which may influence their decision to avoid the science stream. Therefore, in this study, researchers will explore the perspectives of the students and whether the lack of information and guidance about career opportunities in the science field causes students to lose interest in choosing the science stream.

## 5. Methodology

Research methodology is the systematic approach used to conduct this study (Khan et al., 2023). A quantitative approach using a descriptive survey was employed to examine the relationship between career information and guidance and students' interest in the science stream. According to J. O. Boye et al. (2023), this design is effective for collecting descriptive data from a wider population, while also being cost-effective and time-efficient (Nyamwange, 2016; Salama et al., 2020). Anonymity in responses encouraged honest feedback on potentially sensitive topics.

The target population was secondary school students in Johor Bahru, specifically 30 Form 4 Science Stream students from three schools. A population refers to the entire group of individuals sharing common traits relevant to the study (Ahmad et al., 2023; Sileyew, 2019; Garg, 2016). Purposive sampling was used to select students based on their relevance to the research aims (Campbell et al., 2020), ensuring reliable data (Nyimbili & Nyimbili, 2024). Form 4 students were selected as they are beginning to explore academic and career pathways in science.

Data was collected using a questionnaire adapted from J. O. Boye et al. (2023), modified to align with this study's objectives. A pilot study was not conducted due to the limited scope and small sample size of this research. However, to ensure content validity and clarity, the instrument was reviewed and validated by an experienced lecturer in science education. This expert validation helped refine the wording and alignment of items with the study's aims, thereby strengthening the appropriateness of the instrument for data collection. The questionnaire consisted of two parts: demographic information and items related to science aspirations, access to guidance, and its influence. A four-point Likert scale was used to eliminate neutrality and obtain clearer data (Hertanto, 2017). The collected data were analyzed using Microsoft Excel 2016 in terms of frequency and percentage (Alem, 2020), enabling meaningful interpretation of students' perceptions and decision-making in relation to science career guidance.

## 6. Result

### 6.1. Demography

**Table 1**  
*Respondents' Gender*

Gender	Frequency	Percentage (%)
Male	9	30
Female	21	70
Total	30	100

Table 1 shows the gender of the respondent. A total of 21 respondents, constituting 70% of the respondents are female while 30 % or 9 respondents are male.

### 6.2. Science Career Aspirations

**Table 2**  
*Science Career Aspirations*

Aspect	Frequency	Percentage (%)
I aspire to work in a science-related field.	25	83.3
I do not aspire to work in a science-related field.	5	16.7
Total	30	100

Table 2 presents the distribution of career aspirations among Form 4 science stream students. A large proportion of respondents (25 students, 83.3%) indicated an intention to pursue science-related careers, while a smaller group (5 students, 16.7%) reported no such interest.

### 6.3. Perceptions of Career Guidance in Science

#### 6.3.1. My school provides sufficient career counselling about science-related careers.

**Table 3**

*My school provides sufficient career counselling about science-related careers*

Options	Frequency	Percentage (%)
Strongly Disagree	0	0
Disagree	4	13.3
Agree	18	60.0
Strongly Agree	8	26.7
Total	30	100

Table 3 illustrates students' views on the adequacy of school-based career counselling for science-related fields. Most respondents (18 students, 60%) agreed that their schools provide sufficient guidance, while 8 students (26.7%) strongly agreed. A smaller group (4 students, 13.3%) disagreed, and none of them strongly disagreed. This suggests that although schools are offering career counselling in science to a certain extent, the quality and depth of support appear inconsistent across different schools.

#### 6.3.2. I have received helpful guidance about career options in the science field from teachers or school counsellors.

**Table 4**

*I have received helpful guidance about career options in the science field from teachers or school counsellors.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	4	13.3
Agree	18	60.0
Strongly Agree	7	23.3
Total	30	100

Based on Table 4, a significant majority of the respondents, of which is 18 respondents (60%) agreed that they have received helpful guidance about career options in the science field from teachers or school counsellors. There are 7 respondents of which 23.3% strongly agreed with this statement while 4 respondents (13.3%) disagreed. In addition, only one respondent (3.3%) strongly disagreed with this statement.

#### 6.3.3. Career counsellors at my school help me understand the various science career paths available to me.

**Table 5**

*Career counsellors at my school help me understand the various science career paths available to me.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	7	23.3
Agree	17	57.7
Strongly Agree	5	16.7
Total	30	100

Table 5 presents students' views on whether career counsellors help them understand the range of science-related career paths. The majority (17 students, 57.7%) agreed with the statement, while 5 students (16.7%) strongly agreed. In contrast, 7 students (23.3%) disagreed, and only 1 student (3.3%) strongly disagreed. These results suggest

that although many students benefit from counsellors' guidance, a notable proportion remain unconvinced about the adequacy of this support.

**6.3.4. I feel confident in my ability to choose a career in the science field due to the information provided by my school.**

**Table 6**

*I feel confident in my ability to choose a career in the science field due to the information provided by my school.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	9	30.0
Agree	12	40.0
Strongly Agree	8	26.7
Total	30	100

Based on Table 6, 12 respondents (40%) agreed that they feel confident in their ability to choose a career in the science field due to the information provided by their school. However, there are 9 respondents (30%) who disagree with this point of view. 8 of the 30 respondents (26.7%) strongly agreed with this point of view while only one respondent strongly disagreed that he or she feels confident in the ability to choose a career in the science field due to the information provided by the school.

**6.3.5. My school organizes programs, such as workshops or career talks, that effectively introduce science-related career paths.**

**Table 7**

*My school organizes programs, such as workshops or career talks, that effectively introduce science-related career paths.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	4	13.3
Agree	17	56.7
Strongly Agree	8	26.7
Total	30	100

Table 7 shows students' perceptions of school programs, such as workshops and career talks, aimed at introducing science-related career paths. Most respondents (17 students, 56.7%) agreed that such programs were effective, while 8 students (26.7%) strongly agreed. In contrast, 4 students (13.3%) disagreed, and 1 student (3.3%) strongly disagreed. These findings indicate that while most students value the initiatives, a small group still question their effectiveness.

**6.4. Access to Career Information in Science**

**6.4.1. I receive information about science careers through school events, such as career fairs or guest speakers.**

**Table 8**

*I receive information about science careers through school events, such as career fairs or guest speakers.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	10	33.3
Agree	12	40.0
Strongly Agree	7	26.7
Total	30	100

Table 8 presents students' responses on receiving science career information through school events such as career fairs and guest speakers. Twelve students (40%) agreed with the statement, while 7 students (26.7%) strongly agreed. On the other hand, 10 students (33.3%) disagreed, and only 1 student (3.3%) strongly disagreed. These results suggest that while many students benefit from school events as a source of career information, a considerable proportion feel that such initiatives are insufficient or less impactful.

**6.4.2. I have access to clear and detailed information about the different science-related careers through my school.**

**Table 9**

*I have access to clear and detailed information about the different science-related careers through my school.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	6	20.0
Agree	18	60.0
Strongly Agree	5	8.3
Total	30	100

Table 9 shows most respondents, comprising 18 respondents (60%) chose to agree option. They have access to clear and detailed information about the different science-related careers through their school. There are 6 respondents (20%) who disagree with this point of view. 5 respondents (8.3%) strongly agreed that they have access to clear and detailed information about the different science-related careers through their school while only 1 respondent strongly disagreed with it.

**6.4.3. I rely on the internet to gather information about careers in the science field.**

**Table 10**

*I rely on the internet to gather information about careers in the science field.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	0	0.0
Agree	14	46.7
Strongly Agree	15	50.0
Total	30	100

Table 10 illustrates students' reliance on the Internet as a source of science career information. Half of the respondents (15 students, 50%) strongly agreed with the statement, and nearly as many (14 students, 46.7%) agreed. Only 1 student (3.3%) strongly disagreed, while none selected the "disagree" option. These results suggest that the Internet is the primary and most consistent source of career information for the majority of students.

**6.4.4. I have enough information about the qualifications and skills required for science-related careers.**

**Table 11**

*I have enough information about the qualifications and skills required for science-related careers.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	11	36.7
Agree	13	43.3
Strongly Agree	5	16.7
Total	30	100

Table 11 shows that 13 respondents (43.3%) agreed with the statement: I have enough information about the qualifications and skills required for science-related careers while 11 respondents (36.7%) disagreed with it.

Besides, there are only 5 respondents, 16.7% strongly agree with the statement and only 1 respondent (3.3%) strongly disagreed with the statement.

**6.4.5. My school provides adequate resources to explore career opportunities in the science field.**

**Table 12**

*My school provides adequate resources to explore career opportunities in the science field.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	7	23.3
Agree	17	56.7
Strongly Agree	5	16.7
Total	30	100

Table 12 indicates that most respondents, 17 (56.7%), agreed that their school provides adequate resources to explore career opportunities in the science field while 5 respondents (16.7%) strongly agreed. In contrast, 7 respondents (23.3%) disagreed, and 1 respondent (3.3%) strongly disagreed.

**6.5. School STEM Career Opportunities (Science-related)**

**6.5.1. My school offers science-related extracurricular activities, such as science clubs or competitions, that help explore careers in science.**

**Table 13**

*My school offers science-related extracurricular activities, such as science clubs or competitions, that help explore careers in science.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	4	13.3
Agree	11	36.7
Strongly Agree	14	46.7
Total	30	100

Table 13 shows the respondents' perspectives on whether the school offers science-related extracurricular activities, such as science clubs or competitions, that help explore careers in science. There are 14 respondents (46.7%) who strongly agreed with this statement, followed by 11 respondents (36.7%) agreed, 4 respondents disagreed, and 1 respondent (3.3%) strongly disagreed with it.

**6.5.2. My school organizes events or workshops that connect students with professionals in science-related fields.**

**Table 14**

*My school organizes events or workshops that connect students with professionals in science-related fields.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	7	23.3
Agree	14	46.7
Strongly Agree	8	26.7
Total	30	100

Table 14 presents the respondents' views on whether their school organizes events or workshops that connect students with professionals in science-related fields. The majority, 14 respondents (46.7%), agreed with this

statement, while 8 respondents (26.7%) strongly agreed. In contrast, 7 respondents (23.3%) disagreed, suggesting that such events are seldom organized, and only 1 respondent (3.3%) strongly disagreed.

**6.5.3. My science teachers share career opportunities within the science field during lessons.**

**Table 15**

*My science teachers share career opportunities within the science field during lessons.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	3	10.0
Agree	17	56.7
Strongly Agree	9	30.0
Total	30	100

Table 15 shows respondents’ perspectives on whether science teachers share career opportunities within the science field during lessons. Most of the respondents, comprising 17 respondents (56.7%) agreed that their science teachers always share career opportunities within the science field during lessons. 9 respondents (30%) strongly agreed with this statement. However, there are still 3 respondents (10%) and only 1 respondent (3.3%) strongly disagreed with this statement. Their science teacher seldom shares career opportunities within the science field during lessons.

**6.5.4. I have opportunities at school to learn about careers in scientific research or other science-related professions.**

**Table 16**

*I have opportunities at school to learn about careers in scientific research or other science-related professions.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	3	10.0
Agree	15	50.0
Strongly Agree	11	36.7
Total	30	100

Based on Table 16, 50% of the respondents, which are 15 respondents, agreed that they have opportunities at school to learn about careers in scientific research or other science-related professions. Besides, 11 respondents (36.7%) strongly agreed with this statement. There were 3 respondents (10%) who disagreed, and 1 respondent (3.3%) strongly disagreed with this statement. They found that they have fewer opportunities at school to learn about careers in scientific research or other science-related professions.

**6.5.5. My school provides opportunities for exploring science-related careers outside of regular science lessons.**

**Table 17**

*My school provides opportunities for exploring science-related careers outside of regular science lessons.*

Options	Frequency	Percentage (%)
Strongly Disagree	1	3.3
Disagree	8	26.7
Agree	14	46.7
Strongly Agree	7	23.3
Total	30	100

Table 17 illustrates the respondents’ views on whether their school provides opportunities to explore science-related careers beyond regular science lessons. A total of 14 respondents (46.7%) agreed with this statement,

while 7 respondents (23.3%) strongly agreed. On the other hand, 8 respondents (26.7%) disagreed, and 1 respondent (3.3%) strongly disagreed.

### **6.6. Influence of Career Information and Guidance on Interest in Science Stream**

#### **6.6.1. The lack of career information and guidance has made me less interested in pursuing the science field.**

**Table 18**

*The lack of career information and guidance has made me less interested in pursuing the science field.*

Options	Frequency	Percentage (%)
Strongly Disagree	6	20.0
Disagree	11	36.7
Agree	10	33.3
Strongly Agree	3	10.0
Total	30	100

Table 18 presents the respondents' views on whether the lack of career information and guidance has reduced their interest in pursuing the science field. A total of 11 respondents (36.7%) disagreed with this statement, while 10 respondents (33.3%) agreed. Additionally, 3 respondents (10%) strongly agreed, whereas 6 respondents (20%) strongly disagreed, indicating that they believe the lack of information and guidance does not influence their interest in science-related careers.

#### **6.6.2. The lack of career information and guidance has made me not sure what profession would be best for me.**

**Table 19**

*The lack of career information and guidance has made me not sure what profession would be best for me.*

Options	Frequency	Percentage (%)
Strongly Disagree	4	13.3
Disagree	6	20.0
Agree	15	50.0
Strongly Agree	5	16.7
Total	30	100

Based on Table 19, 50% of the respondents, of which 15 respondents agreed that lack of career information and guidance has made them not sure what profession would be best for them. 6 respondents (20%) disagreed with this statement and 5 respondents (16.7%) strongly agreed with it. Besides, 13.3% of the respondents comprising 4 respondents strongly disagreed with it. They believe that the lack of career information and guidance does not make them unsure of what profession would be best for them.

#### **6.6.3. The lack of career information guidance has made it harder to see the value of studying science.**

**Table 20**

*The lack of career information guidance has made it harder to see the value of studying science.*

Options	Frequency	Percentage (%)
Strongly Disagree	6	20.0
Disagree	6	20.0
Agree	14	46.7
Strongly Agree	4	13.3
Total	30	100

Table 20 shows the perspectives of respondents on whether the lack of career information guidance has made it harder to see the value of studying science. Based on the graph, the majority of the respondents, comprising

14 respondents (46.7%) agreed that lack of career information guidance has made it harder to see the value of studying science. Besides, the number of respondents who strongly disagreed and those who disagreed with this statement is the same, totaling 6 respondents (20%). Only 4 respondents strongly agreed that lack of career information guidance has made it harder to see the value of studying science.

**6.6.4. The lack of career information guidance has made me have no idea how to utilize information to choose a certain career in the science field.**

**Table 21**

*The lack of career information guidance has made me have no idea how to utilize information to choose a certain career in the science field.*

Options	Frequency	Percentage (%)
Strongly Disagree	2	6.7
Disagree	11	36.7
Agree	14	46.7
Strongly Agree	3	10.0
Total	30	100

Table 21 shows the perspectives of respondents on whether the lack of career information guidance has made them have no idea how to utilize information to choose a certain career in the science field. 14 respondents (46.7%) agreed that lack of career information guidance has made them have no idea how to utilize information to choose a certain career in the science field. 11 respondents (36.7%) disagreed with it. Besides, only 3 respondents (10%) strongly agreed with this point of view while 2 respondents (6.7%) strongly disagreed with it.

**6.6.5. The lack of career information guidance has made me uncertain about my interests.**

**Table 22**

*The lack of career information guidance has made me uncertain about my interests.*

Options	Frequency	Percentage (%)
Strongly Disagree	6	20.0
Disagree	5	16.7
Agree	15	50.0
Strongly Agree	4	13.3
Total	30	100

Based on Table 22, most of the respondents, comprising 15 respondents (50%) agreed that the lack of career information guidance has made them uncertain about their interests. 6 respondents (20%) strongly disagreed with this statement. They believe that they still can know about their interest even though there is a lack of career information guidance. Besides, 5 respondents (16.7%) disagreed with this statement while 4 respondents (13.3%) strongly agree with it.

**7. Discussion**

The results indicate a strong relationship between career information, guidance, and students' interest in pursuing a science-related career. 83.3% of respondents show high aspiration and interest in the science field. Interestingly, while the findings suggest that the lack of information and guidance does not directly diminish students' initial interest in science, it indirectly reduces their confidence and certainty when making career-related decisions. This distinction is important since students may retain an intrinsic motivation toward science but still hesitate when translating interest into concrete career choices. One possible explanation is that interest often develops from exposure in classrooms, media, or personal fascination, whereas career decision-making requires detailed and

practical knowledge about opportunities, pathways, and qualifications. This aligns with Quinlan and Renninger (2022), who emphasized that the factors such as anticipated academic performance, practical constraints, and the need for proactive career exploration significantly shape students' readiness to act on their interests. Without sufficient guidance, students may struggle to connect their personal interest with realistic career trajectories, leading to indecision despite enthusiasm.

To bridge this gap, schools have implemented strategies such as career talks, workshops, and career fairs. These initiatives are consistent with Super's Career Development Theory, which stresses the importance of exploration during adolescence for career maturity (Alfred et al., 2021). Most of the respondents revealed that their school provides them with sufficient information and pathways about science-related careers. Looking at the benefits and the necessity of having career talks, it allows the students to have direct interactions with the professionals. Professionals share first-hand experiences, up-to-date industry trends, and personal career journeys that make science-related professions more relatable (Sharapova et al., 2023). Similarly, workshops give students the chance to participate in hands-on activities that foster curiosity and make abstract careers feel more tangible. Such interventions are important because they link students' pre-existing interest in science with clearer, more practical understanding of possible career pathways.

Although the school provides the information, many students also collect science-related job information using alternative ways. Most of the respondents, which are 50% strongly agree and 46.7% agree with the statement about using the Internet to gather information. This aligns with the career construction theory which emphasizes the importance of social interaction in shaping career identities (Hartung & Vess, 2018). Students often explore official resources such as government portals, professional organization websites, and platforms like JobStreet and LinkedIn to learn about job scopes, qualifications, and expectations. In addition, they frequently turn to YouTube interviews with professionals in science-related fields. These videos not only showcase individuals who have achieved success but also present relatable role models whose stories students can internalize. By engaging with such self-sought resources, students actively construct their career identities, reducing uncertainty and enhancing confidence. As Zhang et al. (2023) highlight, seeing relatable figures enables students to imagine themselves in similar roles, thereby strengthening their self-belief and motivating them to pursue aspirations in the science stream.

At the same time, inadequate guidance creates clear consequences. Nearly half of respondents (46.7%) reported uncertainty in utilizing career information to make informed choices, and 50% agreed that insufficient information made them uncertain about their own career interests. This distinction can be better understood through the Social Cognitive Career Theory (SCCT), which the roles of self-efficacy and outcome expectations in shaping career choices. According to SCCT, higher self-efficacy and positive outcome expectations increase the likelihood that individuals will pursue and persist in activities consistent with their interests and perceived capabilities (Zola et al., 2022). In the context of this study, while students' intrinsic interest in science may remain strong, insufficient guidance weakens their self-efficacy, creating a confidence gap that manifests as hesitation, delayed decision-making, or eventual withdrawal from science pathways. In other words, passion without structured support and guidance may be insufficient to sustain long-term commitment to science careers.

There are several limitations in this study. First, the analysis is descriptive and does not establish causal relationships between guidance and career interest. Second, the findings rely on self-reported data, which may be influenced by social desirability bias or students' limited self-awareness of their actual career readiness. Besides, the study was conducted within a specific school context, limiting generalizability to broader student populations. These factors should be considered when interpreting the results.

Therefore, future research should employ more robust designs, such as longitudinal studies to examine how early interest in science translates into actual career choices over time. Besides, comparative studies across different schools, regions, or socioeconomic backgrounds could also highlight whether access to career guidance resources shapes outcomes differently. Furthermore, qualitative approaches such as interviews or focus groups may provide deeper insights into why students remain interested yet feel uncertain, revealing the psychological, social, and structural factors that influence their career decision-making. Finally, future work could explore interventions that

not only provide career information but also build students' self-efficacy, thereby bridging the gap between interest and action.

## 8. Conclusion

From the study, the lack of guidance and information on science careers does not significantly affect the interest of sample students in pursuing such careers. However, most of the students claim that sufficient guidance and information from a school counsellor will boost their confidence in choosing the science-related career that suits their ability, interests and skills. The personality test, workshop and seminars that invite science-related field professionals provide students with valuable insight into the qualifications, skills and paths. These efforts provide a transformative impact on enlightened students. Therefore, schools and counsellors must actively strengthen career counselling to ensure students have access to accurate information and feel inspired to join the science-related workforce in the future. This is crucial for a country's prosperity as the generation with science and professional skills can promote the country's economic growth and global competitiveness.

### Declarations

#### **Acknowledgements**

None.

#### **Competing Interests**

None.

#### **Ethical Approval**

This study was granted an exemption from requiring ethics approval as it does not involve human participants or the collection of sensitive personal data. The research is based on bibliometric methods, utilising secondary data exclusively from the Scopus database. As such, it adheres to institutional guidelines that classify this type of study as low-risk and not subject to formal ethics approval.

#### **Author's Contribution**

**Author<sup>1</sup>:** Conceptualization, Data curation, Formal analysis, Writing – original draft

**Author<sup>2</sup>:** Methodology, Formal analysis

**Author<sup>3</sup>:** Analysis Data, Formal analysis

**Author<sup>4</sup>:** Supervision, Writing – review and editing

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#### **Data availability**

None.

## Reference

- Academy of Sciences Malaysia. (2018). Science outlook 2017: Converging towards progressive Malaysia 2050. Kuala Lumpur, Malaysia: *Academy of Sciences Malaysia*.
- Ahmad, N., Alias, F. A., & Abdul Razak, N. 'Aina. (2023). Understanding population and sample in research: key concept for valid conclusion. *SIG e-Learning@CS*.
- Alem, D. D. (2020). An overview of data analysis and interpretations in research. *Academic Research Journal*, 8(1), 1–27.

- Alfred, A. A., John, N., & Joseph, A. (2021). Career decision making among young adults in Ghanaian secondary schools using supers career choice theory as a lens. *International Journal of Psychology and Counselling*, 13(3), 41–51. <https://doi.org/10.5897/ijpc2021.0651>
- Ali, R., & Shafiq, F. (2019). Student's experiences of career counselling and their perceptions of outcomes in Rawalpindi (Pakistan) Colleges. *Pertanika Journals*, 139–153.
- Boye, J. O., Omotosho, J. A., Ria, S. D., Selvia, Eyiah-Bediako, Bentil, J. A., & Dabone, K. T. (2023). Self-knowledge, lack of career information and lack of career counselling as reasons for career indecision among senior high school students in Ghana. *Journal of Humanities and Social Science*, 29(5).
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), 652–661. <https://doi.org/10.1177/1744987120927206>
- Drymiotou, I., Constantinou, C. P., & Avraamidou, L. (2021). Enhancing students' interest in science and understandings of STEM careers: The role of career-based scenarios. *International Journal of Science Education*, 1–20. <https://doi.org/10.1080/09500693.2021.1880664>
- Elias, S., Din, D. R. @. R. H. M., Ali, M. S., Hussain, M. a. M., Ali, M. S., & Hussain, M. a. M. (2023). career guidance for students: Awareness towards course selection and career planning among secondary students. *International Journal of Academic Research in Progressive Education and Development*, 13(3). <https://doi.org/10.6007/ijarped/v13-i3/17487>
- Foi, L. Y., & Kean, T. H. (2023). STEM education in Malaysia: An organisational development approach?. *International Journal of Advanced Research in Future Ready Learning and Education*, 29(1), 1–19.
- Garg, R. (2016). Methodology for research I. *Indian Journal of Anaesthesia*, 60(9), 640. <https://doi.org/10.4103/0019-5049.190619>
- Hartung, P. J., & Vess, L. (2018). Career construction for life design. In *Routledge eBooks* (pp. 91–104). <https://doi.org/10.4324/9781315276175-9>
- Holt-White, E., Montacute, R., & Tibbs, L. (2022). Paving the way: Careers guidance in secondary schools. *Journal of Education*, 4(4), 12.
- Hussain, S., Hussan, K. H. U., & Ahmed, M. (2023). Exploring the need of career counselling for choosing the career at school level in Pakistan: Parents and teachers' perception. *Global Educational Studies Review*, VIII(I), 142–153. [https://doi.org/10.31703/gesr.2023\(viii-i\).13](https://doi.org/10.31703/gesr.2023(viii-i).13)
- Josephat, V., Timothy, M., & Semali, L. M. (2024). Individual career guidance approach for science subject selection among public secondary school students of Karagwe District, Tanzania. *International Journal of Scientific Research and Management (IJSRM)*, 12(10), 3679–3690. <https://doi.org/10.18535/ijprm/v12i10.el01>
- Khan, J. A., Raman, A. M., Sambamoorthy, N., & Prashanth, K. (2023). Research methodology (methods, approaches and techniques). *San International Scientific Publications*. <https://doi.org/10.59646/rmmethods/040>
- Lee, Y.-F., & Lee, L.-S. (2022). Status and trends of stem education in highly competitive countries: country reports and international comparison. *ERIC*. <https://eric.ed.gov/?id=ED623352>
- Lent, R. W., & Brown, S. D. (2013). Social cognitive model of career self-management: Toward a unifying view of adaptive career behavior across the life span. *Journal of Counseling Psychology*, 60(4), 557–568. <https://doi.org/10.1037/a0033446>
- Lent, R. W., & Brown, S. D. (2019). Social cognitive career theory at 25: Empirical status of the interest, choice, and performance models. *Journal of Vocational Behavior*, 115, 103316. <https://doi.org/10.1016/j.jvb.2019.06.004>
- Lent, R. W., Ireland, G. W., Penn, L. T., Morris, T. R., & Sappington, R. (2017). Sources of self-efficacy and outcome expectations for career exploration and decision-making: A test of the social cognitive model of career self-management. *Journal of Vocational Behavior*, 99, 107–117. <https://doi.org/10.1016/j.jvb.2017.01.002>
- Lohr, S. L. (2019). Sampling design and analysis (2nd ed.). *CRC Press*.
- Mahmud, M. I., Kari, N. P. M., & Ai, T. Y. (2022). The relationship between career interest and STEM careers of secondary school students. *Journal of Positive School Psychology*, 6,(2), 587-595.
- Ministry of Education. (2012). Malaysia education blueprint 2013-2025 (Preschool to post-secondary education). Putrajaya, Malaysia.

- Mustafa, N. A., Mohamed Shah, N., Waheda Hashim, N., & Md Desa, M. (2021). An overview of stem education and industry 4.0 for early childhood education in Malaysia. *Journal of Positive School Psychology*, 6(4), 53–62.
- Nik Mat, N. H., Salleh, H. S., Yusof, Y., Mohamed, W. N., & Mohd Noor, N. A. (2021). Panduan penyelidikan ilmiah: kaedah dan penulisan (1st ed.). *UUM Press*.
- Nyamwange, J. (2016). Influence of Student's Interest on Career choice among first year university students in public and private universities in Kisii County, Kenya. *Journal of Education and Practice*.7(4).
- Nyimbili, F., & Nyimbili, L. (2024). Types of purposive sampling techniques with their examples and application in qualitative research studies. *British Journal of Multidisciplinary and Advanced Studies*, 5(1), 90–99. <https://doi.org/10.37745/bjmas.2022.0419>
- Quinlan, K. M., & Renninger, K. A. (2022). Rethinking employability: how students build on interest in a subject to plan a career. *Higher Education*, 84(4), 863–883. <https://doi.org/10.1007/s10734-021-00804-6>
- Radhi, N. a. M., & Sallehuddin, Q. (2024, June 27). STEM enrollment jumps to 50.83 per cent among upper secondary school students. *NST Online*. <https://www.nst.com.my/news/nation/2024/06/1068962/stem-enrollment-jumps-5083-cent-among-upper-secondary-school-students>
- Salama, R., Uzunboylu, H., & El Muti, M. A. (2020). Implementing online questionnaires and surveys by using mobile applications. *New Trends and Issues Proceedings on Humanities and Social Sciences*, 7(3), 48–70.
- Sellami, A., Abdelkader, N., & Umer, S. (2022). A systematic review of STEM education research in the GCC countries: Trends, gaps and barriers. *International Journal of STEM Education*, 9(1), 1-24. <https://doi.org/10.1186/s40594-021-00319-7>
- Sharapova, N., Zholdasbekova, S., Arzymbetova, S., Zaimoglu, O., & Bozshatayeva, G. (2023). Efficacy of school-based career guidance interventions: A review of recent research. *Journal of Education and e-Learning Research*, 10(2), 215–222. <https://doi.org/10.20448/jeelr.v10i2.4554>
- Sileyew, K. J. (2019). Research design and methodology. In *IntechOpen eBooks*. <https://doi.org/10.5772/intechopen.85731>
- Tey, T. C. Y., Moses, P., Cheah, P. K., & Wong, S. L. (2019). Malaysian students' career interest and perception towards STEM programmes and strategies. In *The 7th Workshop on Technology-Enhanced STEM Education (TESTEM WORKSHOP) (Vol. 2)*. Asia-Pacific Society for Computers in Education (APSCE). [https://www.researchgate.net/publication/349310057\\_Malaysian\\_students'\\_career\\_interest\\_and\\_perception\\_towards\\_STEM\\_programmes\\_and\\_strategies](https://www.researchgate.net/publication/349310057_Malaysian_students'_career_interest_and_perception_towards_STEM_programmes_and_strategies)
- Uche, N. (2020). Influence of Counseling Services on Students Career Choice in Secondary Schools: Implication for Career Counseling. *Social Development*, 8(3), 10.
- Wang, D., Liu, X., & Deng, H. (2022). The perspectives of social cognitive career theory approach in current times. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.1023994>
- Ye, J. (2021). The relationship of academic self-efficacy, goal orientation, and personal goal setting among high school students. *Frontiers in Educational Research*, 4(11). <https://doi.org/10.25236/fer.2021.041109>
- Zhang, H., Couch, S., Estabrooks, L., Perry, A., & Kalainoff, M. (2023). Role models' influence on student interest in and awareness of career opportunities in life sciences. *International Journal of Science Education Part B*, 13(4), 381–399. <https://doi.org/10.1080/21548455.2023.2180333>
- Zola, N., Yusuf, A. M., & Firman, F. (2022). Konsep social cognitive career theory. *JRTI (Jurnal Riset Tindakan Indonesia)*, 7(1), 24. <https://doi.org/10.29210/30031454000>

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