High School Physics Students' Perceptions of the Preference of Interest in Learning Using Technology and Interest in Careers in Technology

Siti Nurqualbiah Mat Karim and Aidah Abdul Karim

Abstract – **The integration of technology in educational settings has become a significant factor, fundamentally altering conventional models of teaching and learning. The use of technology in education as perceived by students and how it affects their ideas on careers is still a question. How are they being dependent and to what extent is the level of preference of interest in learning using technology towards the interest in careers in technology among high school physics students. Therefore, this study was conducted with the objective to identify the level of preference of interest in learning using technology and the interest in careers in technology. The methodology of the study is to use a quantitative approach and survey study design. An adapted questionnaire was constructed for the purpose of data collection. This instrument was distributed to 147 respondents among physics students in public schools. SPSS version 29 was utilized for data analysis. The relationship between variables was examined in this correlation study. The inferential statistics Spearman's rho is used. The results indicated that the correlation between preference of interest in learning using technology and the interest in careers in technology was established to be medium (r=0.452, n=147, p<0.001), There is a significant relationship between preference of interest in learning using technology towards the interest in careers in technology. The study suggested a forward-looking perspective, that assists educational institutions and policymakers in anticipating and preparing for upcoming technological trends in learning settings.**

Keywords – **physics students, interest in career, interest in technology**

I. INTRODUCTION

In the evolving context of modern education and professional development, comprehending students' perceptions and conceptualizations of career opportunities is a significant area of academic and societal relevance. The shift from educational settings to professional contexts is becoming more intricate, necessitating a detailed examination of how students formulate their career expectations, aspirations, and comprehension. Motivation and attitude have a considerable impact on students' career expectations, for example in a study in tourism and hotel industries (Kim et al., 2023). Students that are highly motivated tend to have clearer career goals. Knowledge of educational paths is critical. Students' comprehension of the procedures required to accomplish their career goals influenced by their aspirations, with variances depending on gender and prior achievement (Berger et al., 2020).

Siti Nurqualbiah Mat Karim, University Kebangsaan Malaysia, Malaysia (Email address: sitinurqualbiah@gmail.com).
Aidah Abdul Karim, University Kebangsaan Malaysia, Malaysia (Email address: eda@ukm.edu.my).

High school is a significant period in which students begin to establish opinions about educational technology and future career paths in technological disciplines. In Malaysian context, high schools' students are at the age of thirteen until seventeen years old. Physics is one of the subjects in the science stream being offered among students. It is offered with other subjects such as Chemistry, Biology and Additional Mathematics. Understanding how students see the significance of technology in their learning experiences, as well as its potential as a future career path, is critical for educators and industry. This study selected those students who are taking physics in the school to take part in the study.

By examining students' preferences, and experiences with technology-enhanced learning, researchers can acquire useful insights on how educational institutions and technology developers might better build engaging materials involving technology. Furthermore, recognizing these preferences might aid in addressing potential impediments or misconceptions that may deter students from choosing technology-related educational routes and employment. This study aims to find what is the correlation between high school students' perceptions of the preference of interest in learning using technology and interest in careers in technology.

II. PROBLEM STATEMENT

The rapid advancement of technology has fundamentally transformed educational landscapes and professional environments, but there is still a significant gap in understanding how high school physics students perceive and interact with technological tools in their learning experiences and future career goals. The continuous gap between accessible technological tools in educational settings and students' engagement and perceived utility can be traced to several interconnected issues. The educational digital gap has turned toward equitable participation in technology-mediated activities, highlighting impediments to effective integration (Wilson, 2020).

The impact of technology experiences on students' job conceptions and goals is complex, incorporating a variety of psychological and contextual elements. Students' career goals in technology are highly influenced by their self-concept and values, which predict their interest in science-based careers in technology (Smit et al., 2020). The favourable views of STEM experts can increase career goals, particularly for students with strong self-concepts (Chen et al., 2024). It is also shown that the incorporation of digital technologies in STEM education has been found to boost students' enthusiasm and competency, which directly affects their career goals (Subasman & Rusmiati Aliyyah, 2023).

The significance of this research lies in its potential to

enhance understanding of technology's role in student learning and career development and enhance understanding of technology's role in student learning and career development.

III. LITERATURE REVIEW

Interest in learning using technology

Interest in education is a multidimensional concept that plays an important role in improving students' learning and have higher engagement in the classroom. Understanding and developing interest can lead to better academic performance and student retention. Existing studies reveals trends in how to foster enthusiasm in learning, particularly in business, science, and mathematics. There are several factors that influence interest in learning, one of it is curiosity and motivation.

Interest can refer to both a fleeting fascination with an object and a long-lasting desire to explore it deeper. Judith (Harackiewicz et al., 2016). Interest is a psychological condition that involves increased attention, effort, and affect in each instant (situational interest), as well as a long-term desire to revisit a certain object or topic (individual interest) (Hidi & Ann Renninger, 2006). The four-phase model of interest development emphasizes the connection of cognitive and emotional components, emphasizing the significance of external support and good situations for teaching. Relationships also play an important role in fostering interest. An interest-based education practice strives to provide personally relevant learning experiences, which enhance student engagement (Jahner & Raveendaran, 2023).

Interest in careers in technology

Educational endeavours, personal incentives, and external influences all determine student's interest in career in technology. The impact of structured pathways and experiential learning are important in increasing students' engagement in technology disciplines. A study involved initiatives like the Cleveland Tech Talent Pipeline strive to establish multiple avenues for students, including courses, internships, and apprenticeships, to increase participating in computer science (Odom-Bartel et al., 2023). This study has the aims to achieve the learning outcomes among students in computer science and information technology-based subject areas.

Another study in Swiss secondary schools that aims to foster students' interest in science-based technology involving a cooperation project involving local industry. Industry-school relationships give authentic experiences that can drive interest in STEM careers (Smit et al., 2020). However, they may not always lead to greater career interest over time.

Intrinsic motivation and happiness in Information Technology (IT) have a greater influence on students' decisions to pursue technology degrees than extrinsic factors such as money (McKenzie & Bennett, 2022). This study focused into the major choices and career goals of undergraduate information technology students at an Australian university. However, students were unable to explain what these careers may involve, and many were unsure how much time they would spend in the IT field.

Social Cognitive Career Theory

A social and psychological framework called social cognitive career theory (SCCT) aims to clarify and illustrate the steps involved in researching, selecting, and achieving success in a variety of professions. Theorists Gail Hackett, Steven D. Brown, and Robert W. Lent created this idea in 1994. Drawing on Bandura's three-factor causal model, SCCT creates a three-factor interaction model of career, in which the three key concepts are self-efficacy, outcome expectations and personal goals (Buthelezi et al., 2009). Rooted in learning experiences influenced by personal successes and failures, vicarious learning, verbal persuasion, and affective states, self-efficacy and outcome expectations significantly influence one's interests, which in turn influence career choices and achievement performance (Lent et al., 1989).

Self-efficacy refers to a person's belief in their ability to attain specified goals, which influences job choices and tenacity (Zola et al., 2022). Higher levels of career decision-making self-efficacy, CDMSE improve the link between work values and career decisions (Wang et al., 2023). The interrelated self-efficacy with career goal helps students especially in shaping on what they believed and what they can possibly achieved.

On the other hand, higher socioeconomic status (SES) leads to fewer perceived hurdles and more support from family and friends, positively impacting professional interests and activities, especially in STEM disciplines (Turner et al., 2019). Gender and socioeconomic background influence perceptions of supports and barriers, impacting self-efficacy and professional development outcomes (Sevilla M.P & Snodgrass Rangel V., 2022). Social networks play a crucial role in professional development by influencing outcome expectations and predicting interests (Turner et al., 2019).

IV. METHOD

The study focuses on quantitative method research. It is a study among 147 students in two secondary school that have the permission from the parents and the headmaster. They are all at the age of seventeen years old. The respondents were anonymous, and participation was completely voluntary. Random sampling was used and emphasizing the value of participants' availability and desire to take part in the research. A total of 74 students were selected randomly from the name list of the whole form five students in each of the school.

The selection of this approach is based on the purpose of this study. The minimum size sample in a study is believed to be 32 ((Krejcie & Morgan, 1970). It is known that not many students were able to join in this questionnaire and would really have the permission of the principal. The study seeks to enhance the understanding of perception among students in interest in learning using technology and interest in career in technology.

Quantitative data analysis was analysed using SPSS (Version 29). The questionnaires that are being used were adapted from a previous study by (W.Romine, 2012). The questionnaires use Likert Scale [1] strongly disagree, [2] disagree, [3] intermediate,[4] agree and [5] strongly agree.

V. FINDINGS

The findings are presented following the survey structure. The mean score obtained will be interpreted based on a five-point Likert scale adapted from (Nunnally & Bernstein, 1994).

TABLE I: MEAN SCORE INTEPRETS BASED ON A FIVE-POINT LIKERT SCALE

Mean score	Interpretation
1.00-2.00	Low
2.01-3.00	Medium Low
3.01-4.00	Medium High
4.01-5.00	High

Source: Nunnally & Bernstein (1994)

Table 1 shows the mean interpretation based on a five -point Likert that will be use in this study.

TABLE II: CRONBACH'S ALPHA COEFFICIENT RELIABILITY TEST

Variables	Items	Alpha
Interest in learning using technology in Physics	5	0.847
Interest in career in technology	10	0.873

Table 2 shows Cronbach's alpha coefficient in the study. The value that is obtained for interest in learning using technology is 0.847. The value for interest in career in technology is 0.873. Reliability of the research instrument (Derman et al., 2024) states that Cronbach's Alpha Coefficient Reliability Test value of 0.8 is regarded as extremely dependable. Given that every variable obtained a value greater than 0.8, it can be stated that the questionnaires are a reliable instrument for measurement.

TABLE III: PREFERENCE OF INTEREST IN LEARNING USING TECHNOLOGY AND INTEREST IN CAREER IN TECHNOLOGY

Item		Frequency %			
	INTEREST IN LEARNING USING TECHNOLOGY				
	SD	D	I	A	SA
1	I enjoy learning using technology to solve Physics related problems				
Freq	0	2	16	69	60
%	0.0	1.4	10.8	46.6	40.5
Mean = 4.27					
2	The use of technology helped me learn Physics				
Freq	0	0	17	60	70
%	0.0	0.0	11.5	40.5	47.3
Mean = 4.36					
3	Technology makes learning Physics more interesting.				
Freq	0	0	8	58	81
%	0.0	0.0	5.4	39.2	54.7
Mean= 4.50					
4	I enjoy using technology to learn Physics				
Freq	0	0	11	62	74
%	0.0	0.0	7.4	41.0	50.0
Mean= 4.42					
5	I think more time is allocated using technology in learning Physics				
Freq	1	9	33	46	58
%	0.7	6.1	22.3	31.1	39.2
Mean = 4.03					
	INTEREST IN CAREER IN TECHNOLOGY				
	SD	D	I	A	SA
1	I would be more likely to choose a job if it involves working with technology.				
Freq	0	6	35	60	46
%	0.0	4.1	23.6	40.5	31.1
Mean = 3.40					
2	Having a job in a field related to technology will be interesting				
Freq	0	3	26	66	52
%	0.0	2.0	17.6	44.6	35.1
Mean= 4.13					
3	I would like to work in a science-related field.				
Freq	2	11	38	42	54
%	1.4	7.4	25.7	28.4	36.5
Mean = 3.91					
4	I want to work in a technology related field.				
Freq	1	9	39	60	38
%	0.7	6.1	26.4	40.5	25.7
Mean = 3.85					
5	I want to work in a science-related field that uses technology.				
Freq	1	10	35	56	45
%	0.7	6.8	23.6	37.8	30.4
Mean = 3.91					
6	I want to work in that part solving science-related problems with technology.				
Freq	1	14	51	48	33
%	0.7	9.5	34.5	32.4	22.3
Mean = 3.67					
7	I would enjoy a job that uses technology.				
Freq	0	2	34	65	46
%	0.0	1.4	23.0	43.9	31.1
Mean = 4.05					
8	I would probably choose that job if it involved the use of technology.				
Freq	1	9	35	63	39
%	0.7	6.1	23.6	42.6	36.4
Mean = 3.88					
9	I would enjoy working in a science related field.				
Freq	1	11	39	47	49
%	0.7	7.4	26.4	31.8	33.1
Mean = 3.89					
10	I would like to work in a laboratory environment or science field				
Freq	10	26	47	34	30
%	6.8	17.6	31.8	23.0	20.3
Mean = 3.32					

Table 3 shows descriptive analysis of the preference of interest in learning using technology and preference of interest in career in technology. The Likert Scale involved are [1] strongly disagree, SD [2] disagreed, D [3] intermediate I,[4] agree, A and [5] strongly agree, SA. Preferences of interest in learning using technology show that 46.6 % of students agreed on enjoy learning using technology to solve Physics related problems. While a total of 40.5% strongly agreed, 10.8% were on intermediate and only 1.4% disagreed. The mean is 4.27 that is interpreted as high.

A total of 47.5 % of students strongly agreed on the use of technology helped them to learn Physics. Only 11.5% intermediate and 40.5% agreed on the use of technology helped the students. The mean is 4.36 which was also high. Majority of the students, with 54.7% strongly agreed on technology makes learning Physics more interesting. Only 5.4% intermediate agree and 39.2% agreed on the use of technology makes learning Physics more interesting. The mean is 4.50 which is interpreted as high. Half of the students, 50 % were strongly agreed stating they enjoy using

technology to learn Physics. Only 7.4% intermediate agree and 41.0 % were agreed on stating they enjoy using technology to learn Physics.

Only 0.7% strongly disagreed on more time is allocated using technology in learning, 6.1% disagreed, 22.3% intermediate, 31.1% agreed and 39.2% strongly agreed. It means they agreed that more teaching and learning should be involved with the integration of technology. It has mean 4.03 which is interpreted as high.

The preference of interest in career in technology with 40.5% agreed they would be more likely to choose a job if it involves working with technology, 31.1% strongly agreed, 23.6% intermediate and 4.1% disagreed. The mean 3.40 which is interpreted as medium high. Only 2.0% disagreed on having a job in a field related to technology will be interesting, 17.6% intermediate, 44.6% agreed and 35.1 % strongly agreed. The mean 4.13 which is high. Several 36.5% strongly agreed on they would like to work in a science-related field. Only 1.4 % strongly disagreed, 7.4 % disagreed, 25.7 % intermediate and 28.4 % agreed. The mean is 3.91 which is interpreted as medium high.

Students are strongly agreed with 25.7% that they would want to work in a technology related field. Only 0.7% strongly disagreed, 6.1% Disagreed, 26.4%intermediate and 40.5% agreed. It has mean 3.85 with an interpretation as medium high. Students with a percentage of 30.4 strongly agreed on working in a science-related field that uses technology. Only 0.7% strongly disagreed, 6.8% disagreed, 23.6% intermediate and 37.8 % agreed. The mean is 3.91 which is medium high.

The finding further indicated 22.3 % strongly agreed on working in solving science-related problems with technology, 32.4% agreed, 34.5% intermediate, 9.5 % disagreed and 0.7% strongly disagreed. The mean is 3.67 which interpreted as medium high. Only 1.4% disagreed that they would enjoy a job that uses technology, 23.0% intermediate, 43.9% agreed and 31.1% strongly agreed. The mean is 4.05 which is high.

Students with 36.4% strongly agreed that they would probably choose that job if it involved the use of technology. Only 0.7% strongly disagreed, 6.1% disagreed, 23.6% intermediate and 42.6% agreed. The mean is 3.88 which is medium high. Students also strongly agreed on they would enjoy working in a science related field. It has 33.1 % strongly agreed, 31.8% agreed, 26.4% intermediate, 7.4 % disagreed and 0.7% strongly disagreed. The mean is 3.89 which is medium high. Only 6.8% strongly disagreed on they would like to work in a laboratory environment or science field. The rest 17.6% disagreed, 31.8 % intermediate, 23.0% agreed and 20.3% strongly agreed. It has mean 3.32 which interpreted as medium high.

TABLE IV: SPEARMAN'S RHO CORRELATIONS

			Interest in Learning using technology	Interest in Career in technology
Spearman's rho	Interest in Learning using technology	Correlation Coefficient	1.000	0.452
		Sig(2-tailed)		0.001
		N	147	147
	Interest in Career in technology	Correlation Coefficient	0.452	1.000
		Sig(2-tailed)	0.001	
		N	147	147

As shown in Table 5, the correlation coefficient of Spearman's rho between preference on interest in learning using technology and interest in career in technology is 0.452. The strength of a relationship, strong that is r = 0.50 to 1.0, medium which is r = 0.30-0.49 and small which is r= 0.10 to 0.29 (Cohen, 2013). It shows that it has a medium correlation. The p-value obtained is 0.001 which is less than 0.05, so there is a significant relationship between preference on interest in learning using technology and interest in career in technology.

VI. DISCUSSION

The preference of high school students in interest in learning using technology were mostly be interpreted by the scale as high. On the other hand, mostly the preference of interest in career in technology has been interpreted as medium high. This is in line with a study in finding the attitudes of the secondary school students related to value of technology that were not very high on the scale ratings (Smit et al., 2020).

This study shows that that there is a significant relationship between preference on interest in learning using technology on learning using technology and interest in career in technology. According to study using an expectancy-value model, students' attitudes toward technology are critical determinants of their professional choices, with self-concept and values playing important roles(Smit et al., 2020). The study further indicated the importance of practical experiences in technology education to encourage interest in related vocations, particularly among students who may not immediately indicate interest. This is in line with a study that shows specific classroom activities, such hands-on projects and interactive learning, greatly increase students' interest in technology jobs (Ardies et al., 2015).

Another study that shows the increased motivation can lead to higher understanding of job prospects in technology, as indicated by the moderate correlation between learning interest and career planning awareness. The study involved students in a vocational high school (Herlambang et al., 2023).

Interest in using technology to learn has gain benefits, with studies demonstrating its ability to boost student engagement and motivation. Several studies show that technology not only sparks early interest but also sustains and expands it through interactive and individualized learning experiences. The Interest-Driven Creator (IDC) theory demonstrates how engaging course content can inspire situational interest, leading to deeper immersion and eventually an extension of interest in educational technology (Wong et al., 2023). The interest-driven creator (IDC) theory is being created as a

collaborative effort by Asian researchers to describe a comprehensive learning design theory for future education in Asia. The notion proposes that students, motivated by curiosity, can participate in the creation of knowledge (creating ideas and objects)(Chan et al., 2019). According to the Interest-Driven Creator (IDC) idea, interesting course material can spark situational interest, which in turn can result in greater immersion and a longer-lasting interest in educational technology.(Luan Wong et al., 2023).

According to a study, using technology-based learning materials greatly increases students' interest and improves their involvement with Christian Religious Education (Tambunan & Iskandar, 2024). It shows the use of technology helps improves learning among students. There are a lot of resources using technologies such as *YouTube* have been found to be useful resources for boosting students' interest in a variety of courses (Puhka et al., 2023).

A study also shows that by combining students' interests with technology, Interest-Based Learning (IBL) increases motivation and self-efficacy and produces a more relevant learning environment (Kulkarni & Chu, 2024).

VII. CONCLUSION

The study revealed that there is a significant relationship between preference on interest in learning using technology and interest in career in technology among high school students. Technology in education help students to gain interest in their learning. It is then also increasing their interest in career in technology. Students spend one-third of their day at school, as the primary learning environment to ignite students' interest. Administrators and teachers can properly plan the school environment and teaching material for education with the integration of technology to enhance students' physical, mental, and environmental development, as well as provide intangible environmental value to help shape their interest in learning and will further increase their future career interest. Schools should offer education trainings using technology especially to the teachers. Based on the limitations of the study, it is suggested that future research will include studies among gender preferences, the used of Seven Likert scale to have better precision and with a bigger number of participants.

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