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Assessing Student Engagement and Preferences Pathways: A Case Study of Science and Social Pathways at Hun Sen KrongTepNimithPailin High School, Cambodia

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A B S T R A C T

This study investigates the attitudes and preferences of upper secondary school students at Hun Sen KrongTepNimithPailin High School in Cambodia towards the Science and Social Science pathways. Using a quantitative research design, data were collected via an online survey comprising Likert-scale questions. The survey explored students' liking for subjects like Khmer Studies, mathematics, reading, writing, and their perceptions of autonomous learning, science, and technology. Descriptive statistics and model analyses revealed key insights: a significant dislike for memorizing lessons, a moderate to high enjoyment of Khmer Studies and reading, and a varied interest in writing and presenting. Notably, students showed a strong and statistically significant liking for mathematics in Model 2 (positive coefficient of 16.49, P-value: 0.002) compared to Model 1. Although students favored technology, their knowledge of it was not statistically significant in either model. Overall, Model 2 provided better explanatory power and statistical significance (Prob > F: 0.000, R-squared: 0.136), highlighting the need for targeted educational strategies to enhance student engagement and success in both STEM and social science disciplines.

Keywords: *Social Pathways, Science Pathways, Educational Disparities, STEM Education, Student Engagement, Student Preferences*

1. Introduction

Historically, Cambodia's education system has undergone significant transformations, shaped by both internal developments and external influences. Before the 1970s, Cambodia had a traditional education system focused primarily on religious and cultural teachings, with Buddhist monasteries serving as centers of learning. Formal education under French colonial rule introduced Western-style schooling, although access was limited mostly to urban areas and the elite (LWB, 2023)[1]. Yet by the year 1795 the Khmer Rouge regime severely disrupted Cambodia's educational progress, as schools were closed and intellectuals were targeted and killed. Following the regime's overthrow, the country faced a long period of reconstruction. Since the 1990s, Cambodia has made substantial efforts to rebuild its education system, focusing on expanding access and improving quality. Key reforms included the establishment of the Ministry of Education, Youth, and Sport (MoEYS) to oversee educational policies and initiatives (The World's Children's Prize, 2024)[2]. Today, Cambodia's education system comprises three main levels: primary education (grades 1-6), lower secondary education (grades 7-9), and upper secondary education (grades 10-12). Education is free and compulsory up to grade 9. The curriculum includes a mix of academic subjects and vocational training, with recent emphasis on STEM education to meet the demands of a modernizing economy. Challenges remain, such as disparities in access between rural and urban areas, quality of infrastructure and resources, and teacher training. Efforts continue to address these challenges through policy reforms, international cooperation, and investments in educational infrastructure and technology (Bun, 2023)[3].

1.1 Overview of Hun Sen KrongTepNimithPailin High School

Hun Sen KrongTepNimithPailin High School is located in Pailin Province, Cambodia. It serves as a prominent educational institution in the region, catering to students in their upper secondary years, typically aged 15 to 18 years old. The school plays a crucial role in providing academic and vocational education, preparing students for higher education or entry into the workforce. The high school likely offers a curriculum that includes both general education subjects and specialized tracks such as Science and Social Science pathways, reflecting Cambodia's educational reforms aimed at enhancing STEM education and broader academic opportunities. Facilities at the school may vary, encompassing classrooms, laboratories, and possibly additional resources aimed at supporting students' learning and development. Overall, Hun Sen KrongTepNimithPailin High School serves as a key institution in its community, striving to equip students with the skills and knowledge necessary for their future endeavors.

1.2 Overview of New Guideline for Education Curriculum in Upper Secondary (High) School

In 2010, the Ministry of Education, Youth and Sport (MoEYS) introduced the "Guidelines on Implementing the General Education Curriculum in Upper Secondary Schools" to enhance preparedness for higher education and advance STEM education in Cambodia. These guidelines established a new framework for upper secondary education, delineating two separate pathways: one focused on sciences and the other on social sciences (MoEYS, 2010)[4]. Yet, by 2020 a study shows that there exists a considerable disparity in enrollment rates between the science and social science tracks at upper secondary schools. Enrollment in the science track plummeted from 96% in 2014 to just 34% by 2020, whereas enrollment in the social science track surged from 4% in 2014 to 66% in the year of this study (MoEYS, 2020)[5]. Thorough research is necessary to explore the factors influencing students' choice to switch from the science track to the social science track. The lack of sufficient literature underscores the critical need for evidence that can guide policymakers and development partners in identifying effective interventions. According to a study conducted by Pov et al. (2024)[6] through a cluster sampling method, it is found that a majority of older students preferred the social science path instead of the science path. Notably, while the official school age for grade 12 students is 18 years old, approximately 37.6% of the participants were aged between 19 and 24 years, categorizing them as overage students. Yet another study by Van (2023)[7] found that challenges like inadequate funding, educational resources, and qualified teachers are the challenges.

1.3 Problem Statements and Objectives of the Study

Despite ongoing efforts to promote STEM education in Cambodia, significant challenges persist in effectively meeting the educational needs of upper upper secondary school students. These challenges include issues such as inadequate funding, limited access to educational resources like textbooks and laboratories, and a shortage of highly qualified STEM teachers. Moreover, the overall student enrollment in STEM-related disciplines, particularly in upper secondary schools, faces disparities between the Science and Social Science pathways. Understanding the underlying reasons for these disparities is crucial for developing targeted interventions that can enhance educational outcomes and career opportunities for Cambodian students.

This study focuses on exploring the attitudes and preferences of students attending Hun Sen KrongTepNimithPailin High School towards the Science and Social Science pathways. By investigating factors such as students' perceptions of career prospects, academic interests, and their educational experiences within these pathways, this research aims to provide actionable insights for policymakers and educators. The findings will contribute to the development of evidence-based strategies that promote greater student engagement and success in both STEM and social science disciplines, thereby fostering a more robust and inclusive educational environment in Cambodian upper secondary schools.

2. Literature Review

2.1 What is STEM?

STEM stands for Science, Technology, Engineering, and Mathematics (Granovskiy, 2018)[8], and it represents an interdisciplinary approach to education and professional fields that integrate these core disciplines. The STEM disciplines are interconnected and emphasize problem-solving (Iwuanyanwu, 2020)[9], critical thinking, innovation, and collaboration, preparing individuals to tackle complex real-world challenges. Each component of STEM plays a crucial role in advancing technology, driving innovation, and addressing global issues.

Science forms the foundational pillar of STEM, encompassing the study of natural phenomena, principles, and empirical methods of inquiry. It includes fields such as biology, chemistry, physics, and earth sciences, focusing on understanding the natural world through observation, experimentation, and evidence-based reasoning (Siverling, E. A., Flores, E. S., & Moore, T. J., 2018)[10]. Scientific knowledge underpins advancements in medicine, environmental sustainability, and technological development.

Technology encompasses the tools, systems, and processes that humans use to solve problems and achieve goals (Alatas, F., & Yakin, N. A., 2021) [11]. It ranges from digital technologies like computers, software, and information systems to physical technologies like machinery and manufacturing processes. Technological advancements in STEM drive automation, communication, and the development of new products and services, shaping modern society and economies.

Engineering applies scientific principles and mathematics to design and create solutions for practical problems (Utley, J., Ivey, T. A., & Cribbs, J., 2020) [12]. It involves the application of knowledge in fields such as civil, mechanical, electrical, and chemical engineering to innovate, build infrastructure, improve processes, and develop new technologies. Engineers play a crucial role in designing sustainable cities, improving transportation systems, and advancing medical devices and equipment.

Mathematics serves as the language and framework for understanding patterns, relationships, and quantitative data in STEM fields (Kristensen, M. A., Larsen, D. M., Seidelin, L., & Svabo, C, 2023) [13]. It provides the tools for modeling, analyzing, and solving complex problems across disciplines. Mathematics is fundamental in fields such as computer science, finance, physics, and engineering, enabling advancements in cryptography, data analysis, and mathematical modeling for scientific research and technological development.

Together, STEM disciplines form the backbone of innovation and progress in the modern world, driving economic growth, scientific discovery, and technological advancements that shape our lives and address global challenges. STEM education emphasizes interdisciplinary learning, creativity, and critical thinking skills essential for preparing future generations to succeed in an increasingly complex and technology-driven world.

2.2 Science and Social Science Tracking in Cambodia Education System

Tracking is the method by which students are categorized based on certain criteria and then placed into different groups. These groups are subsequently assigned to various types of classes. This system allows for a more tailored educational experience, where students with similar academic abilities or interests can learn together in an environment suited to their specific needs (Oakes, 1985) [14]. In Cambodia, the primary goal of tracking is to enhance students' abilities in science and mathematics during their upper secondary school years. This system aims to create clear and distinct educational pathways that are closely connected to students' future academic majors and career choices. By focusing on these key areas, tracking helps ensure that students are well-prepared for higher education and professional opportunities, particularly in fields that require strong scientific and mathematical skills(MoEYS, 2010b)[15].

A substantial amount of research on students' decisions to pursue science majors is grounded in various theoretical frameworks. Behaviorists analyze the factors influencing students' choice of academic majors through the lens of their behaviors. Psychologists and experts in academic achievement investigate this phenomenon from psychological or academic performance perspectives. Key areas of focus when examining the factors that influence students' decisions to choose science majors include personal ability and affective factors. Studies from these perspectives have identified gender as a significant factor (Kao, S., & Shimizu, K., 2019) [16]. Additionally, social science researchers frequently attribute the varying outcomes in students' choice of academic majors (science versus social science) to deficiencies in their home environments (Miller, J. D., & Kimmel, L. G., 2012) [17]. According to human capital theory, students acquire varying levels of cultural knowledge and social connections based on their families, homes, and community networks (Niu, 2017) [18].

Finally, school practices play a crucial role in shaping students' decisions regarding their choice of academic majors. Specifically, the period during upper secondary school allows students to determine whether they will pursue STEM majors and careers after graduation (Darolia, et al., 2018) [19]. Factors in upper secondary school can either inspire students to engage deeply in science and mathematics, thus influencing their decision to pursue STEM majors, or conversely, deter them from entering the STEM pipeline. The impact of educational institutions' positive influences was also noted as significant (Wang, X., & Lee, S. Y., 2019) [20].

The study findings by Kao Sovansophal, Chea Phal and Song Sopheak (2022)[21] suggest that Cambodian upper secondary school students, particularly female science-track students, are prone to changing their majors when transitioning to higher education. Despite initially choosing the science track, female students often shift towards non-STEM majors like business management and finance. This decision is influenced by individual academic abilities, preferences, family socioeconomic status, and support from both schools and universities. Recommendations include enhancing teaching methods in science and mathematics to foster practical application and engagement, promoting interactive learning experiences, providing targeted career guidance in STEM fields for underrepresented female groups, and challenging gender stereotypes in science and mathematics education. Improving the quality and inclusivity of higher education entrance criteria is also suggested to support students in pursuing their chosen academic paths effectively.

3. Methodology

3.1 Descriptive Statistics

In relation to students' perception towards Khmer Studies, the survey results provide a comprehensive view of students' attitudes towards education, skills, and technology. Students strongly endorse the practical benefits of science (mean score of 3.74) and exhibit moderate to high enjoyment of reading (mean score of 3.38). Writing received moderate enjoyment with a mean score of 2.96, indicating a less pronounced interest, while presenting showed a neutral stance. Technology was generally viewed positively, with many expressing moderate to high levels of enjoyment. Specifically, students showed a moderate to high liking for Khmer Studies (mean score of 3.42), a moderate to above-average liking for reading (mean score of 3.38), a moderate to slightly below-average liking for writing (mean score of 2.96), and a moderate enjoyment of memorizing lessons (mean score of 3.07). Autonomous learning was also viewed favorably, with a mean score of 3.29 indicating moderate to above-average liking.

Table1: Descriptive Analysis on Students' Perception towards Khmer Studies

Variable	Definition	%					Mean
		1	2	3	4	5	
Q1	How much do you like Khmer Studies?	5.32	11.7	32.98	35.64	14.36	3.42
Q2	How much do you like reading?	2.66	9.04	45.74	32.98	9.57	3.38
Q3	How much do you like writing?	8.51	20.21	42.55	24.47	4.26	2.96
Q4	How much do you like memorizing the lesson?	10.11	18.09	35.11	27.66	9.04	3.07
Q5	How much do you like autonomous learning?	5.35	12.83	39.04	32.62	10.16	3.29

Note: 1: Very Dissatisfied, 2: Dissatisfied, 3: Neutral, 4: Satisfied, 5: Very Satisfied

In regard to students' perception towards mathematics, the survey results reveal students' attitudes towards mathematics, critical thinking, problem-solving, and presenting. Mathematics received an overall moderate to high level of enjoyment, with a mean score of 3.43, and 51.60% of students rating it 4 or 5. Critical thinking and problem-solving also had a moderate to high enjoyment level, with a mean score of 3.39, and 47.87% of students rating it 4 or 5. Presenting had a moderate level of enjoyment, with a mean score of 3.12, and the largest group (46.52%) rating it 3. A smaller but significant portion of students expressed a higher level of liking for presenting, with 22.46% rating it 4 and 9.09% rating it 5

Table2: Descriptive Analysis on Students' Perception towards Mathematics

Variable	Definition	%					Mean
		1	2	3	4	5	
Q6	How much do you like mathematics?	8.51	13.3	26.6	30.32	21.28	3.43
Q7	How much do you like critical thing or problem-solving?	4.79	13.83	33.51	32.98	14.89	3.39
Q8	How much do you like presenting?	6.42	15.51	46.52	22.46	9.09	3.12

Note: 1: Very Dissatisfied, 2: Dissatisfied, 3: Neutral, 4: Satisfied, 5: Very Satisfied

Moreover, in response to their perception and attitude towards science and technology, the survey results reveal diverse attitudes towards science, technology, and their benefits. For science, 55.32% of respondents rated their liking at 4 or 5, with an average score of 3.56, indicating moderate to high enjoyment. Technology also received moderate to high enjoyment, with 45.22% rating it 4 or 5, and an average score of 3.46. Knowledge of technology showed moderate understanding, with 50.27% rating it a 3, and an average score of 3.17. Knowledge of technology for survival similarly reflected moderate familiarity, with 50% rating it a 3, and an average score of 3.13. Perceptions of science's daily benefits were largely positive, with 63.83% rating it 4 or 5, and an average score of 3.74, indicating science is seen as moderately to highly beneficial.

Table3: Descriptive Analysis on Students' Perception and Attitude towards Sciences and Technology

Variable	Definition	%					Mean
		1	2	3	4	5	
Q9	How much do you like science?	9.04	11.17	24.47	25.53	29.79	3.56
Q10	How much do you like technology?	5.85	9.04	39.89	23.94	21.28	3.46
Q11	How much do you know about technology?	4.28	14.44	50.27	22.46	8.56	3.17
Q12	How much do you know about technology for survival?	2.66	18.09	50	21.81	7.45	3.13
Q13	How beneficial is science to your daily life.	6.38	6.91	22.87	34.04	29.79	3.74

Note: 1: Very Dissatisfied, 2: Dissatisfied, 3: Neutral, 4: Satisfied, 5: Very Satisfied

Based on the survey analysis, it revealed significant insights into students' attitudes and perceptions. Question 13, which assessed the benefits of science in daily life, received the highest mean score of 3.74, indicating a positive view of science's practical value. Conversely, question 3, regarding enjoyment of writing, had the lowest mean score of 2.96, suggesting less enthusiasm for this activity. Question 8 showed a neutral sentiment towards presenting, with 46.52% selecting a middle option. Questions 9 and 10 demonstrated positive attitudes toward science and technology, with mean scores of 3.56 and 3.46, respectively. Overall, students expressed moderate to high enjoyment for Khmer Studies (mean score of 3.42) and reading (mean score of 3.38), while showing varied preferences, especially towards writing and presenting. These findings highlight a generally favorable attitude towards science and technology and underscore the diverse educational preferences among respondents.

3.2 Data Collection and Analyses

This study employs a quantitative research design to investigate high school students' attitudes and preferences towards various educational subjects and activities at Hun Sen KrongTepNimithPailin High School. Utilizing an electronic online survey administered via Google Forms, the research collects data through Likert-scale questions ranging from 1 to 5. These questions assess students' liking for specific subjects such as Khmer Studies, reading, and mathematics, as well as their enjoyment of activities like writing and presenting. Additionally, the survey explores students' attitudes towards autonomous learning and their perceptions of science and technology. The quantitative approach allows for systematic data collection and analysis, providing numerical insights into the extent and distribution of preferences and perceptions among the student population. This methodological framework aims to offer a clear understanding of how students at the school engage with and prioritize various aspects of their educational experience.

Data Collection: The survey instrument employed in this study utilized Likert-scale questions ranging from 1 to 5, enabling respondents to express their preferences and perceptions across various domains. These questions encompassed a wide range of topics including the liking for specific subjects like Khmer Studies, reading, and mathematics. Additionally, the survey explored respondents' enjoyment levels regarding activities such as writing and

presenting, their attitudes towards autonomous learning, and their perceptions of science and technology. This structured approach allowed for a comprehensive assessment of students' attitudes and preferences towards different educational subjects and activities at Hun Sen KrongTepNimithPailin High School.

Data Analysis: Descriptive statistics formed the backbone of data analysis in this study, focusing on the attitudes and preferences of high school students at Hun Sen KrongTepNimithPailin High School. Mean scores were meticulously computed for each survey question, providing a clear measure of the overall liking or enjoyment levels reported by respondents. This approach allowed for a nuanced understanding of student sentiments across various educational domains, including their attitudes towards subjects like Khmer Studies, reading, mathematics, and activities such as writing and presenting. Additionally, percentage distributions were utilized to highlight the variability in responses across the Likert-scale options ranging from 1 (indicating low preference or enjoyment) to 5 (indicating high preference or enjoyment). This method not only quantified the degree of consensus or divergence among students but also revealed insightful patterns in how they perceive and engage with different facets of their educational experience.

3.3 Model and Sampling size

Sample Selection: Out of the 500 eligible students at Hun Sen KrongTepNimithPailin High School, 260 valid responses were collected for the survey. From these, 200 responses were carefully selected for comprehensive analysis based on stringent criteria for completeness and validity. This selection process ensured that only responses with all survey questions fully answered were included in the final dataset. Responses with missing data or incomplete answers across any survey question were intentionally excluded to uphold the integrity and reliability of the data analysis. This methodological rigor aimed to provide a robust examination of students' attitudes and preferences towards various educational aspects, thereby minimizing potential biases that incomplete data could introduce. By focusing exclusively on complete and valid responses, the study aimed to accurately depict student perceptions and engagement levels across different academic domains and activities surveyed at Hun Sen KrongTepNimithPailin High School.

This equation indicates how each factor contributes to Total Score of the students as the dependent variable.

$$score_{total} = \beta_0 + \beta_1 Q_1 + \beta_2 Q_2 + \beta_3 Q_3 + \beta_4 Q_4 + \beta_5 Q_5 + \beta_6 Q_6 + \beta_7 Q_7 + \beta_8 Q_8 + \beta_9 Q_9 + \beta_{10} Q_{10} + \beta_{11} Q_{11} + \beta_{12} Q_{12} + \beta_{13} Q_{13} + \varepsilon_i$$

Where: β_0 is the intercept.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_6 \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}, \beta_{12}, \beta_{13}$ are the coefficients for each independent variable.

$\boldsymbol{\varepsilon_i}$ represents the error term.

4. Results of the Study

The survey results from Hun Sen KrongTepNimithPailin High School in Model 1 revealed that students have a moderate to high liking for Khmer Study (positive coefficient of 10.396, P-value: 0.213) and Mathematics (positive coefficient of 12.463, P-value: 0.151), though neither was statistically significant. A significant dislike was noted for memorizing lessons (negative coefficient of -20.304, P-value: 0.006). Autonomous learning showed neutrality (coefficient of 0.728, P-value: 0.935). Although students favored technology (positive coefficient of 13.787, P-value: 0.137), their knowledge of technology for survival was only slightly positive (coefficient of 3.389, P-value: 0.728). Despite some positive attitudes, the model's overall statistical significance (Prob > F: 0.0031) contrasted with low explanatory power (R-squared: 0.1622, Adjusted R-squared: 0.0985).

Table 4: Comparison of the Two Models

Variables	Definition	Model 1			Model 2		
		Coef.	T-value	P-value	Coef.	T-value	P-value
q1	How much do you like Khmer Studies?	10.396	1.25	0.213			
q2	How much do you like reading?	-4.869	-0.52	0.605			
q3	How much do you like writing?	-5.805	-0.7	0.483			
q4	How much do you like memorizing the lesson?	-20.304	-2.77	0.006***	-18.32	-3.32	0.001***
q5	How much do you like autonomous learning?	0.728	0.08	0.935			
q6	How much do you like mathematics?	12.463	1.44	0.151*	16.49	3.07	0.002***
q7	How much do you like critical thing or problem-solving?	10.136	0.95	0.346			
q8	How much do you like presenting?	-4.325	-0.56	0.576			
q9	How much do you like science?	-3.341	-0.36	0.718			

q10	How much do you like technology?	-12.496	-1.38	0.169			
q11	How much do you know about technology?	13.787	1.49	0.137*	11.10	1.6	0.112*
q12	How much do you know about technology for survival?	3.389	0.35	0.728			
q13	How beneficial is science to your daily life.	7.349	0.86	0.393			
_cons		642.53	17.65	0.000	639.11	21.68	0.000
Prob > F		0.0031			0.000		
R-squared		0.1622			0.136		
Adj R-squared		0.0985			0.122		

***Note**: *10% level significant; **5% level significant; ***1% level significant*

However, in regard to Model 2, the analysis highlighted key insights into students' preferences and knowledge. Students expressed a significant dislike for memorizing lessons (Q4) with a negative coefficient of -18.32, a T-value of -3.32, and a P-value of 0.001. Conversely, they showed a strong liking for mathematics (Q6), indicated by a positive coefficient of 16.49, a T-value of 3.07, and a P-value of 0.002. Knowledge about technology (Q11) had a positive coefficient of 11.10 but was not statistically significant (T-value of 1.6, P-value of 0.112). The model's constant term had a coefficient of 639.11, a T-value of 21.68, and a P-value of 0.000. Overall, the model was statistically significant (Prob > F: 0.000) and explained a moderate portion of the variance (R-squared: 0.136, Adjusted R-squared: 0.122).

Comparing the two Models of results from Hun Sen KrongTepNimithPailin High School reveals key findings about students' attitudes and perceptions. Both models show a significant dislike for memorizing lessons, with Model 1 reporting a negative coefficient of -20.304 (P-value: 0.006) and Model 2 a negative coefficient of -18.32 (T-value: -3.32, P-value: 0.001). Students' liking for mathematics varied between the models: Model 1 indicated a moderate to high liking with a positive coefficient of 12.463 (P-value: 0.151), though not statistically significant, while Model 2 showed a strong and statistically significant liking with a positive coefficient of 16.49 (T-value: 3.07, P-value: 0.002). Knowledge about technology was positively viewed in both models but not statistically significant; Model 1 had a coefficient of 13.787 (P-value: 0.137) and a slightly positive coefficient for knowledge for survival (3.389, P-value: 0.728), while Model 2 reported a positive coefficient of 11.10 (T-value: 1.6, P-value: 0.112). The overall model significance was better in Model 2, which was statistically significant (Prob > F: 0.000) with moderate explanatory power (R-squared: 0.136, Adjusted R-squared: 0.122), compared to Model 1, which was also statistically significant (Prob > F: 0.0031) but had low explanatory power (R-squared: 0.1622, Adjusted R-squared: 0.0985).

In summary, both models highlight a significant dislike for memorizing lessons. Model 2 indicates a stronger and statistically significant liking for mathematics compared to Model 1. Positive attitudes towards technology are evident in both models, but neither shows statistical significance. Overall, Model 2 provides more reliable explanatory power and significance compared to Model 1, offering clearer insights into specific areas like mathematics and technology knowledge. Both models reflect varied student preferences, but Model 2 offers more precise information on students' attitudes towards these subjects.

5. Conclusion and Recommendation

5.1 Conclusion

In conclusion, based on the survey results from high school students at Hun Sen KrongTepNimithPailin High School, several key insights can be inferred about the students' attitudes and preferences. Students showed a moderate to high liking for subjects like Khmer Studies, reading, and mathematics. Khmer Studies, likely valued for its cultural relevance, received positive feedback, suggesting its alignment with students' heritage and identity. Similarly, reading was well-received, indicating students value literacy and the knowledge gained from texts. Mathematics was also popular, reflecting its recognized importance for both academic and real-world problem-solving skills. These interests suggest the effectiveness of current teaching methods and materials, highlighting areas where educators can continue to innovate and tailor their approaches to further engage students.

However, the survey revealed varied engagement with activities like writing and presenting, compared to more favored subjects like science and technology. Writing and presenting received mixed responses, with writing being less favored, possibly due to its perceived lack of immediate rewards. This disparity suggests a need for educational enhancement in these areas, such as integrating digital tools or project-based learning to make these activities more relevant and engaging. The positive perception of science and technology underscores their perceived relevance and value, with students recognizing the importance of these subjects for their future careers. Additionally, students exhibited a moderate to above-average preference for autonomous learning, valuing the opportunity to take ownership of their learning experiences. These findings provide valuable insights for educators to design learning experiences that empower students and foster a robust learning environment tailored to their interests and needs.

5.2 Recommendation

Based on the survey results from high school students at Hun Sen KrongTepNimithPailin High School, several recommendations can be made to enhance the educational experience and better align with students' interests and preferences:

Educators should leverage the positive feedback for Khmer Studies by emphasizing cultural and linguistic elements, incorporating local heritage, and identity content to deepen student engagement. Similarly, the strong interest in reading suggests a high value placed on literacy, which can be sustained by expanding reading materials to include diverse genres and contemporary topics, encouraging a lifelong habit of reading. Mathematics, being popular for its practical applications, should be further enhanced through real-world problem-solving scenarios and hands-on activities that demonstrate the relevance of mathematical concepts in everyday life.

The positive perception of science and technology underscores their importance for future careers, suggesting a need for enriched curricular offerings, such as advanced science projects, technology workshops, and exposure to cutting-edge developments. Encouraging participation in science fairs and technology competitions can further boost engagement. Additionally, fostering autonomous learning by designing experiences that allow for independent study and self-directed inquiry, along with creating a supportive learning environment that encourages exploration and innovation, can significantly enhance overall student engagement.

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