

The Role of Family Income and Parental Influence on STEM Participation: Implications for Career Guidance

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Abstract: This study examined the association between family income, perceived parental influence in taking STEM, and performance in the specialized fields of STEM learners in one public senior high school in Eastern Visayas, Philippines. The study utilized descriptive and correlational research designs involving ninety-eight (98) senior high school learners taking the Science, Technology, Engineering, and Mathematics (STEM) strand. The study used an adopted “Adolescent-Parent Career Congruence Scale (APCC)” survey questionnaire to measure the learners' perceived parental influence in taking STEM. Spearman's rank correlation coefficient (r_s) was utilized to examine the association between family income and perceived parental influence and specialized fields' performances. Likewise, the Pearson product-moment correlation coefficient (r) was used to determine the association between parental influence and the specialized fields' performances of STEM learners. Results indicated no association between family income and parental influence on STEM learners and a significant negative association between the family income group and the STEM learners' performance in the specialized fields. There is also a weak and positive association between the STEM learners' perceived level of parental influence in taking STEM and their performance in the specialized fields. Therefore, learners' career guidance should be reinforced so that they can be guided in making sound decisions. Future related studies are likewise recommended to further substantiate this study's findings.

Keywords: Family Income, Parental Influence, Senior High School Learners, Specialized Fields, STEM

1. Introduction

One of the critical features of the Enhanced Basic Education Act of 2013 (RA 10533) in the Philippines was the provision of Grades 11 and 12, also recognized as the Senior High School (SHS) level (Brillantes et al., 2019), which is the second part of the Philippines' secondary basic education (Sarmiento & Orale, 2016). The goal of this enhanced basic education act, adding two more years from its previous 10-year basic education, was to equip the learners with the necessary 21st-century skills while also producing well-rounded citizens in the country (Barrot, 2021; Dizon et al., 2019; & Mohammad, 2016). In addition, the SHS Curriculum included four (4) contextualized tracks, one of which is the Academic track, which contains four (4) academic strands.

The Science, Technology, Engineering, and Mathematics (STEM) strand under the Academic track plays a vital role in a nation's development and growth. Maksimović (2020) claimed that the STEM strand is one of the most essential and in-demand professions, accounting for most industrial innovations. However, several studies reported a decline in high school learners wanting to choose STEM as a career (Abe & Chikoko, 2020; Rafanan et al., 2020; Blotnick et al., 2018; Vijandren, 2018; Halim & Meerah, 2016; Bottia et al., 2015; Cannady et al., 2014), thereby resulting in countries seriously needing human resources who are STEM graduates to help the country's productivity rating and as well as to stay competitive on the global stage. A learner's understanding of a STEM career will directly impact his or her desire to pursue one in the future (Razali, 2021).

In the United States, Vu et al. (2019) cited that those choosing STEM are focused and determined to complete this field, perhaps implying how difficult STEM is for many learners, which has discouraged some from pursuing this field. Correspondingly, Lichtenberger and George (2012) noted that high school learners with greater educational aspirations are more likely to be inclined toward STEM. On the other hand, Niu (2016) indicated that receiving external incentives for good grades from parents regularly reduces learners' likelihood of choosing STEM compared to receiving such rewards on an irregular basis. Meanwhile, in the Philippines, Rafanan et al. (2020) indicated that learners' aspirations and their preferred college course after completing SHS are the reasons that impelled them to engage in STEM.

The influence of family on the STEM cradle-to-career pathway is a well-known but understudied phenomenon (Craig et al., 2018). Those learners who choose to pursue a career in STEM are observed to have been fostered and accompanied by their parents. Correspondingly, Coşkun and Katıtaş (2021) added that the participation of parents has led to multiple meanings, which can be classified as "home-based or school-based involvement." A high sense of self-worth, the stimulus for learning, and positive academic results are all associated with a high level of home and school family involvement (Alaçam & Olgan, 2019; Marin & Bocoş, 2017). What happens at home then influences the learners' school experience, with teachers gratifying them with more thought-provoking tasks, which leads to improved grades, test scores, and, eventually, degrees (PSU, 2021).

The study by Thomas et al. (2020) confirmed that parents are hesitant to support their children's interest in STEM-related careers when they think they need more content knowledge to assist them in learning the subject matter. As a result, a learner may pursue a career unrelated to his or her interests and may need to be more personally fulfilling. Likewise, Hornby and Blackwell (2018) found that parents with limited educational backgrounds were reluctant to participate in their children's learning endeavors. In the same way, a parent's educational background could impact their children's early development of knowledge and skills, and so do their values and expectations.

Similarly, Dawes et al. (2015) stated that, aside from teacher guidance, their parents greatly stimulate the learners' choices in STEM-related fields. Tey et al. (2020) and An et al. (2018) also mentioned that parents significantly impacted the learner's willingness to STEM and their intention to take up STEM careers. As early as kindergarten, parents can inspire their children to develop an interest in STEM, assist them in deciding on a future career path, provide opportunities for learning STEM-related knowledge and skills, and serve as role models (Dorie et al., 2014; Cabuquin, 2022). This also suggests that parental influence could mean providing learners with a positive learning environment at home, monitoring their progress in school, keeping an eye on their behaviors outside of the classroom, and supporting their decisions.

Regarding family context, Lichtenberger and George (2012) disclosed that learners from families with high and mid-high incomes had lower chances of showing an early interest in STEM than their low-income counterparts. This could indicate that majoring in a STEM field may be influenced more by economic factors than by social factors for some learners. Mitsopoulou and Pavlato (2021) added that learners from low-income and low-to-moderate-income families are more likely to pursue STEM. Compared to a high-income group, learners from low-income families may be more decisive in choosing STEM or focusing only on a specific field because they want to avoid switching college programs, which would cost them time and money. Their early interest in STEM could also be due to their desperate need for work and potential employment opportunities (Haryanti et al., 2016), which could relieve their family's financial stress.

Li and Qiu (2018) revealed that when compared to rural learners, learners' scholastic performance in an urban setting is more influenced by their socioeconomic status, citing that rural learners' academic success is more reliant on their study habits. While according to Adzido (2016), a low-income status only sometimes implies poor scholastic performance. While high-income families may provide learners with quality learning resources that may improve their performance, for motivated learners, low-family income should not be used as a ground for poor scholastic performance. On the contrary, Ahmed and Hanif (2016) indicated a significantly positive difference in the performance of low-income and high-income learners. Inadequate guidance and support from parents due to financial stress may cause learners to perform poorly in class, eventually leading to poor scholastic performance.

Moreover, apart from learners' attitudes and career awareness, their success in STEM and the development of 21st-century skills are likewise shaped by the efficacy of teachers (Han et al., 2021). Comparably, learners' scholastic aptitude is also crucial to their success in STEM (Mingoa & Abocejo, 2021), especially in major subjects like mathematics and science (Awang et al., 2021; Blotnick et al., 2018; Cabuquin & Abocejo, 2023). Therefore, augmenting 21st-century competencies through STEM teaching and learning is highly essential for the improvement of a nation, as well as the various factors that may influence a learner's likelihood of pursuing STEM-related fields must be considered.

Although there is some research on parental influence, most of them are conducted on elementary children in an international setting, with only a few focusing on secondary school learners (Coşkun & Katıtaş, 2021; Tey et al., 2020; Alaçam & Olgan, 2019; Craig et al., 2018; An et al., 2018; Marin & Bocoş, 2017; Dawes et al., 2015; Dorie et al., 2014), particularly those majoring in STEM. Moreover, there is also a dearth of research in the Philippine setting investigating the influence of parents on learners' STEM choices as perceived by senior high school learners under the STEM strand. Moreover, the association between the perceived parental influence in taking STEM, family income, and the performance of STEM learners in the specialized fields has also not been thoroughly established. Hence, a crucial need to examine the association between family income and perceived parental influence in taking the STEM strand and performance in the specialized fields of STEM learners must be compelled. This present study intends to assist not only parents but also senior high school teachers and administrators in strengthening career guidance for senior high school learners so that they can make wise decisions and improve their scholastic performance.

1.1 Research Objectives

This study examined the associations among family annual income, parental influence towards the choice of taking the STEM strand, and performance in the specialized fields of STEM learners in a government-owned Secondary Institution in Eastern Visayas, Philippines. Specifically, this study determined the (1) levels of family annual income, parental influence, and learners' performance in specialized fields, and (2) the association between family annual income, parental influence, and specialized fields' performances. This present study proceeded with the null hypothesis of no significant association between the family annual income and the STEM learners' parental influence and specialized fields' performances, as well as no significant association between the parental influence in taking the STEM strand and STEM learners' performances in the specialized fields.

1.2 Theoretical and Conceptual Frameworks

This study is anchored on the Self-determination theory established by psychologists Ryan and Deci (2017). SDT represents a scientifically based theory of human personality growth and behavior that describes intrinsic and extrinsic drives, as well as their origins and functions in individuals' cognitive and social development (Turner, 2019). The notion of self-determination has been used in various contexts, including education, work, and parenting, to name a few. In psychology, self-determination indicates an individual's capability to make decisions and manage his or her own life. It gives people a sense of control over their decisions, and they are more inclined to act if they feel their actions will influence the outcome (Cherry, 2021).

Concerning this study, the learners' decisions of what career to pursue in SHS may also be influenced by either external or internal motivation. Ryan and Deci (2017) argued that high-quality types of motivation and engagement, such as improved performance, persistence, and creativity, are fueled by settings that support an individual's perception of autonomy, competence, and relatedness. In a school context, self-determined learners are more likely to feel inspired to achieve their educational goals. Likewise, there are ways that parents and educators can assist learners in developing this trait and be intrinsically motivated. For instance, when learners perform well, giving positive feedback might aid their development, and averting excessive external rewards for activities that they already grasp can help them boost their internal motivation or self-determination (Salikhova et al., 2020).

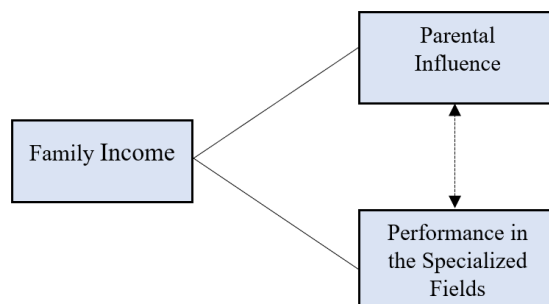


Figure 1. Conceptual Framework of the Study

In Figure 1, the variables employed by the researchers were presented and classified as dependent and independent variables. The independent variables in the study include the learners' family income and parental influence. On the other hand, the dependent variable was identified as the SHS learners' performance in the

specialized fields as the continuous level of measurement. These variables were categorically measured as the nominal and continuous levels of measurement. Correlation analyses were calculated between the variables to investigate the influence of family income and parental influence on SHS learners' specialized fields of performance.

2. Materials and Methods

2.1 Research Design

The study utilized descriptive and correlational research designs. A correlation was used to measure the extent of associations between variables in the study. Further, it explored the association between family income, perceived parental influence on STEM choice, and learners' performances in the specialized fields.

2.2 Research Locale

The study was conducted in a certain Laboratory School in the Eastern Visayas region. The said laboratory school is situated in the City of Tacloban, the capital of the Leyte province in Eastern Visayas, Philippines. Further, it is under the institution's teacher education department and is currently offering Junior high school and Senior high school programs for its constituents. In the academic year 2020-2021, the laboratory school had a total population of 679 enrolled learners, 66.27% were coming from the Junior high level, and 33.73% were in the Senior high level.

2.3 Research Respondents

A total of 98 learners (composed of 52 male and 46 female) were selected using the purposive sampling technique with the inclusion criteria of taking Science, Technology, Engineering, and Mathematics (STEM) who were officially enrolled in the first and second semesters of the academic year 2020-2021.

2.4 Ethical Considerations

The researchers secured permission from the Laboratory School Department of Eastern Visayas State University. The researchers secured informed consent from the respondents, and the nature and purpose of the study were explained at the beginning of the survey. The respondent's participation was voluntary, and they could withdraw from participating at any time, which would not affect their academic grades. Additionally, all relevant data gathered from the respondents were solely utilized for this study, and their identities were treated with confidentiality. All data collected were deleted from the researcher's computer after data analysis.

2.4 Research Instrument

The study utilized the "Adolescent-Parent Career Congruence Scale (APCC)" survey questionnaire adopted from the study of Sawitri et al. (2013) and Suryadi et al. (2020). This questionnaire comprised 12 statements that describe two aspects of congruence. Seven statements depict the "needs-supplies and demands-abilities congruence," while five represent the similarities between parents and adolescents regarding career choice. The statements found in the APCC were highly relevant to the study's objective to measure the perceived parental influence in the learners' choice of STEM strand.

2.5 Data Gathering Procedure

Before conducting this study, we made a request letter to ask permission from the school head with attached copies of the study's objectives, the research questionnaire, and a rationale explaining the purpose of the study. After permission was granted, informed consent was provided to the target group, likewise informing them of the purpose of the study. Then, the research questionnaire through Google survey forms was given to the STEM learners, providing them adequate time to respond. Further, the performances of the STEM learners in the Specialized fields, as measured by their grades in the subjects, were retrieved from the Registrar's Office. The gathered records included the STEM learners' performances in Pre-Calculus, General Biology 1, and Basic Calculus. These subjects were taken by the learners who were in their first year of Senior high, particularly in the first and second semesters of the academic year 2020-2021 under the STEM strand.

2.6 Data Analysis

The gathered data in this study were summarized and presented in tabular and graphical formats. Similarly, we used frequency counts, percentages, standard deviations, and weighted means to describe the data. We utilized Spearman's rank correlation coefficient (r_s) to examine the association between family income and the STEM learners' perceived level of parental influence and specialized fields' performances. The Pearson product-moment correlation coefficient (r) was likewise used to determine the association between parental

influence and specialized fields' performances of STEM learners. A significance alpha of 0.05 was set for the study.

3. Results and Discussion

Table 1 presents the level of parental influence in taking the STEM strand as perceived by the Senior high school learners.

Table 1. Perceived Level of Parental Influence in Taking the STEM Strand

Indicator	WM	SD	Interpretation
My parents encouraged me to explore the career areas I am interested in.	4.17	1.03	Very influential
My parents support me in my career plans.	4.26	0.96	Extremely influential
My parents show me how to get the information I need for my career interest (e.g., go to a career exhibition, see someone).	3.73	1.17	Very influential
My parents approve of the plans I am making for my future career.	4.13	0.94	Very influential
The progress I have made towards my career goals makes my parents happy.	4.23	1.01	Extremely influential
My parents help me to explore my career interests (e.g., by buying me books, taking me to career fairs).	3.60	1.22	Very influential
My parents are satisfied with the effort I have put in so far to achieve my career goals.	4.12	0.99	Very influential
My parents want the same career for me as I want for myself.	3.71	1.18	Very influential
My parents and I have similar career interests.	2.92	1.24	Somewhat influential
The career plans I have for myself are similar to the plans that my parents have for me.	3.22	1.13	Somewhat influential
I am interested in the career areas that my parents expect me to enter.	3.45	1.15	Very influential
My parents and I have the same way of defining career success.	3.62	1.20	Very influential
Grand Mean	3.77	1.10	Very influential

N=98; 1.00 – 1.80 Not at all influential; 1.81 – 2.60 Slightly influential; 2.61 – 3.40 Somewhat influential; 3.41 – 4.20 Very influential; 4.21 – 5.00 Extremely Influential

As shown in the table, most of the learners revealed that their parents are “very influential” in their choice of STEM strand. This could mean the learner's parents are encouraging and supportive of their chosen field and career plans. Their willingness to influence and support their sons' or daughters' choice of STEM could also be attributed to the wide range of work opportunities it can provide. Similarly, Song and Glick (as cited in Rafanan&De Guzman, 2020) stated that the learners' enthusiasts to pursue a career in STEM may be shaped by their expected potential earnings and the many job options available to STEM graduates, as there is always a high demand for careers in the STEM fields.

In addition, only a few learners indicated a “somewhat influential” level of parental influence in taking STEM. This implies that their parents may not be very engaged in deciding why they choose STEM, they do not have the same career goals as their sons or daughters, or they do not simply want them to take up STEM-related fields for some reason. This matter should be investigated to understand why parents do not support or be involved in their learner's career interests. However, as we mentioned in this study, it only accounts for a small group of learners under investigation and may be little mentioned.

As shown by the mean score of 3.77 with a standard deviation of 1.10, most of the respondent's parents are very influential in choosing STEM-related fields. However, this only means that the parents actively encourage and push their learners to do their best in their chosen fields. The parents' support and encouragement in their learner's education not only boost the enthusiasm and performance of learners but also help parents and teachers understand them better (Nevski & Siibak, 2016; Pineda et al., 2018; Liu et al., 2020).

Table 2. Frequency Distribution of STEM Learners' Family Income Group

Income Group	Frequency	Percent (%)
High income (but not rich)	4	4.08
Upper middle income	6	6.12
Middle class	14	14.29
Lower middle class	32	32.65
Low income (but not poor)	25	25.51
Poor	17	17.35

Rank	Income Range	Income Group	N=98
7	≥P219,140	Rich	
6	P131,484 - P219,139	High income (but not rich)	
5	P76,669 - P131,483	Upper middle income	
4	P43,828 - P76,668	Middle class	
3	P21,194 - P43,827	Lower middle class	
2	P10,957 to P21,193	Low income (but not poor)	
1	<P10,956	Poor	

The family income group of the Senior high school STEM learners is presented in Table 2. As can be gleaned from the table, roughly one-third (32.65%) of the STEM learners are in the lower-middle-class group, and slightly more than one-fifth of them belong to the middle class (14.29%) and upper-middle class (6.12%) income groups. The family income, which ranges from rich to poor income group, as used in this study, utilized the data from the “Philippine Institute for Development Studies (PIDS)” which is based on the Philippines’ 2020 poverty threshold (Adrian, 2021 & Albert et al., 2018).

Further, it can be observed that when categorized by family monthly income, most STEM learners fall into the low-income to middle-class income categories, indicating that their parents have sufficient resources and capacity to provide for their children's basic needs, especially their education. The Philippines, however, is one of the countries hardest hit by the COVID-19 outbreak. Consequently, the Philippines' poverty level has heightened, causing havoc on the country's educational system and inflicting hardships on many underprivileged families, including those in the low and lower-middle-income groups.

Moreover, the form of acquiring knowledge in the country has likewise transformed, with face-to-face education being suspended, shutting down classrooms, and a massive shift to online learning taking place (Miller et al., 2020). For this reason, poor-income families and even lower, middle, and upper-middle-income families have encountered financial constraints because of the COVID-19 health crisis. Similarly, in this study, STEM learners' parents are compelled to buy gadgets, internet access, and other resources that their learners can use for online learning, which adds to their everyday expenses and priorities.

Table 3 presents the performance of STEM learners in the Specialized fields, specifically Pre-Calculus, Basic Calculus, and General Biology 1. As gleaned from the figure, one-half (50%) of the STEM learners displayed outstanding performance in Pre-Calculus, and about two-fifths (39.8%) demonstrated satisfactory PC performance levels. In addition, most of the STEM learners (52.04%) manifested outstanding performance in Basic Calculus, while nearly one-third (29.59%) exhibited satisfactory BC performance levels. In General Biology 1, the performance of the STEM learners is quite remarkable, as most of them performed outstandingly (91.84%) in the subject. This outstanding performance of the learners in GB1 may be attributed to their strong prior knowledge of the subject since most of the GB1 lessons were already discussed in their elementary and junior high levels as compared to PC and BC, wherein there are some unfamiliar concepts that the learners need to comprehend to learn the subject contents. Moreover, the remarkable performance in GB1 may be linked to other factors like the subject's relevance to the learners, learning motivation, teaching efficacy, study habits, and attitude towards the subject.

Table 3 Distribution of STEM Learners' Performance in the Specialized Fields (SF)

Level	PC		BC		GB 1	
	f	%	f	%	f	%
Excellent	15	15.31	22	22.45	21	21.43
Superior	27	27.55	27	27.55	68	69.39
Very Good	44	44.90	29	29.59	6	6.12
Good	8	8.16	18	18.37	2	2.04
Pass	4	4.08	2	2.04	1	1.02

Grades	Description	Total Frequency = 98	
100 – 96	Excellent	PC Mean Score = 89.91	SD = 4.44
95 – 91	Superior	BC Mean Score = 90.16	SD = 5.58
90 – 86	Very Good	GB1 Mean Score = 93.49	SD = 3.45
85 – 81	Good		
80 – 75	Pass		

Their mean scores show that the STEM learners exhibited outstanding performance levels in BC ($\mu = 90.16$) with a standard deviation of 4.44 and GB1 ($\mu = 93.49$) with a standard deviation of 5.58, respectively. Meanwhile, their PC performance is satisfactory, as indicated by the mean score ($\mu = 89.91$), posting a standard deviation of 3.45. Compared to BC, the STEM learners found PC slightly more challenging. The slight difference in the mean scores between PC and BC is still surprising as we expect that the learners would find BC a more challenging subject as they must first take PC, which is a prerequisite subject of BC, as mentioned in their subject checklist. There could be reasons for this difference, such as the learners' transition from junior to senior high school, or they could be overwhelmed by the subject because it was new to them. Learners in the STEM strand perform exceptionally well in specialized fields.

The result in Table 4 revealed that there is no association between family income and parental influence on STEM learners. This suggests that family income has no bearing on whether the parents would influence their children's choice to pursue a STEM-related career. Regardless of financial conditions, families with a high or low income can be influential or not influential on their children's educational aspirations; they can either provide their children advice on how to choose the best professional path for them or allow their children to make their own choices. However, according to Bolotin et al. (2016), when learners' perceptions of their family's financial conditions are high, they become less interested in studying STEM fields in higher education. Meanwhile, Mitsopoulou and Pavlato (2021) mentioned that learners from low-income and low-to-moderate-income families are more likely to pursue STEM than learners from high-income families, contrary to the present study's finding of no association.

Table 4. Spearman's Correlation between family income and STEM students' Parental Influence and specialized fields' performances

Group		Spearman's rho	
		r_s	p
Family Income	Parental Influence	- 0.064**	0.528
	SF Performance	- 0.730*	0.000

*Significant at the 0.05 level; ** Not Significant at the 0.05 level; N=98

On the other hand, the family income group and the STEM learners' performance in the specialized fields indicated a significant negative association. This finding signifies that STEM learners from high and mid-high-income families tend to perform poorly in the specialized fields while learners from low-income families perform better. Adzido (2016) claimed that low-income status does not automatically predict poor scholastic performance, which is evident from this present study's finding that financial constraints do not prohibit the underprivileged from succeeding. Meanwhile, low interest in STEM among learners from high and mid-high-income families may be a factor in their ability to succeed in the specialized fields. When the learners' interests do not match with the disciplines they are studying, it will be difficult for them to excel and do equally well as

motivated learners, even if they are provided with the resources needed for their studies. This contradicts the findings of Ahmed and Hanif (2016), who bared a substantial difference between the performance of learners from low-income and high-income families, with the latter performing better.

Table 5. Pearson Correlation between parental Influence and specialized fields' performances of STEM students

Variable	Pearson r	
	r	p
Parental Influence	0.319*	0.001
SF Performance		

*Significant at the 0.05 level; N=98

As displayed in Table 5, there is only a weak and positive association between the STEM learners' perceived level of parental influence in taking STEM and their performance in the specialized fields. This finding may imply that, while parents can influence their children who are taking STEM to do well in their chosen field, their parental influence may not be compelling as there may be other leading factors such as their educational aspirations, motivation, or the influence of teachers and peers that may likewise shape their willingness to succeed in their studies. Alternatively, low STEM learners' performance in specialized fields does not necessarily mean a lack of parental support and supervision. As Mingoa and Abocejo (2021) pointed out, learners' scholastic aptitude is equally critical for them to thrive in their chosen fields.

An et al. (2018) disclosed that the positive influence of parents increases learners' STEM scholastic performance. Lara and Saracosti (2019) further asserted that low parental participation in school could lead to lower learner performance. Similarly, in this study, the degree to which parents may influence their children's education is crucial in their educational desires, especially their performance in specialized fields. In other words, parents play a significant role in influencing learners' choices in STEM-related careers (Dawes et al., 2015). However, it should be noted that parental influence is associated with STEM learners' performance in specialized fields; the strength of the association cannot be statistically generalized since the relationship was found to be inadequate.

4. Conclusion and Recommendations

This study examined the association among family income, perceived parental influence in taking STEM, and performance in the specialized fields of STEM learners. The results indicated no association between family income and parental influence on STEM learners and a significant negative association between the family income group and the STEM learners' performance in the specialized fields. There is also a weak association between the STEM learners' perceived level of parental influence in taking STEM and their performance in the specialized fields. Hence, it is recommended that parental orientation sessions regarding the various academic tracks available in senior high school must be conducted regularly. This will enable parents to effectively guide and explain to their children which track aligns with their chosen career aspirations. Additionally, it is recommended that teachers receive appropriate training and orientation to better inspire and influence students, fostering a positive attitude towards learning.

Considering the outcomes of this study, we likewise recognize that there are some potential drawbacks. First, the present study only looked at income as a possible indicator of a family's socioeconomic status; it did not take into account the educational fulfillment and occupation of parents. Second, only three specialized fields within the STEM strand (Pre-Calculus, General Biology 1, and Basic Calculus) were considered since these were the only specialized fields obtainable during the academic year. Third, limited to just one senior high school in the Philippines, the findings may only apply to some secondary schools in the country. Similar studies involving STEM learners from larger institutions may provide a more comprehensive national view of learners' perceived parental influence on their STEM choices.

Similarly, the COVID-19 outbreak may have influenced learners' SHS career choices, as the Philippines is one of the countries hardest hit by the global pandemic. They may have chosen a senior high school that was convenient for their situation and desires at the time, as well as the learning modality used by the school, because the majority of schools in the region where the study was conducted used a modular learning modality, with only a few using online distance learning. As a result, deciding on a senior high school career path was no longer a priority. Lastly, this present study considered only the learners' perceived parental influence in STEM. Another intriguing concept is to include parents' viewpoints regarding their involvement in their children's

career choices. Other prominent aspects, such as learners' motivation, school environment, gender, teacher factor, and peer factor, should be examined to understand better what drives learners' choice of STEM-related careers. A career guidance orientation for senior high school learners should also be strengthened to guide them in making wise decisions. Future studies may likewise use a mixed-method approach to substantiate this study's findings further.

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