

LEVEL 7 ASSESSMENT SPECIFICATION

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Academic honesty / referencing:	Academic honesty is required. In the main body of your submission, you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

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1 Title

How do Product-Related and Social Media Perceived Values Influence Parents' Decisions to Select STEM Courses for Their Children in Hong Kong?

Abstract

This study examines the effects of product-related perceived value and social media influence on Hong Kong Parents' decisions to enrol their children in STEM courses. A quantitative method is used and data was collected by the survey questionnaire from 65 parents. The results of the study indicated a positive relationship between higher perceived values of STEM courses and parents' decisions to enrol their children, and social media plays a small but significant role in it. This research advances the field of educational marketing by providing a statistical analysis of the factors that influence parental choice for STEM education in the context of Hong Kong. Management implications for academic institutions and future research implications of the findings are discussed.

This article proceeds in the following manner. First, we provide a review of the perceived value and social media literature. Second, we examine and discuss the relationship between each of the dimensions and parental decisions. Third, we describe the research design and report the results of the hypothesis tests and regression analysis. Finally, we examine the implications of the results for marketers and researchers.

This study investigates the impact of product-related perceived value and perceived effectiveness of social media marketing on Hong Kong parents' decisions to enrol their children in STEM courses. The research employs a quantitative method, utilising a survey questionnaire to gather data from a sample of parents in Hong Kong. The primary objectives are to assess the relationship between perceived values and parental decisions and to determine the extent to which social media influences these decisions. The findings indicate a strong positive correlation between higher perceived values of STEM courses and parents' decisions to enrol their children, with social media playing a moderate yet significant role. The study concludes with actionable insights for educational institutions and course providers, suggesting that enhancing the perceived value of STEM courses and actively engaging on social media platforms can significantly influence parental decisions. This research contributes to the field of educational marketing by providing a quantitative analysis of the factors influencing parental choice in STEM education within the Hong Kong context.

Keywords: STEM Education, Parental Decision-Making, Perceived Value, Social Media Influence, Consumer Behavior, Word-of-Mouth (WOM)

2 Introduction

Science, technology, engineering and mathematics (STEM) education is rapidly expanding in the education sector. This research was developed due to the growing interest of parents in STEM education and the need to understand the factors that influence parents' to enrol their children in STEM courses.

Previous empirical studies have focused on the importance of perceived value in the consumer decision-making process. Zeithaml (1988) and Sweeney and Soutar (2001) provide foundational insights into how perceived value influences consumer judgments and decisions. Additionally, according to Kaplan and Haenlein (2010) and Mangold and Faulds (2010), the transformative role of social media in consumer behavior has been identified as a significant influence on educational choices.

Unfortunately, no study has focused specifically on the impact of product's perceived value and social media on parental choice to enrol their children in STEM education in the context of Hong Kong. This research attempts to bridge the gap by the following.

1. to examine the influence of a product's perceived value on parents ' choice of STEM courses.
2. to access how social media marketing impacts the parent's choice of STEM courses.
3. to provide information on how social media can be used effectively to increase the perceived value of STEM courses

This study will contribute in different aspects. First, it performs a statistical analysis of the factors that affect Hong Kong parent's choice of STEM courses. Besides, it provides valuable insights for educational institutions on how to attract and retain students appropriately and develop more effective marketing strategies. Finally, this study can provide a suitable groundwork for improving Hong Kong's marketing position of STEM education in the world.

3 Literature Review

This literature review provides a complete analysis of consumer behaviour in the field of STEM education with a particular focus on the Hong Kong education market. It is important to understand the parental decision-making process when choosing STEM courses for their children.

For many years, it began with a review of the development of perceived value, which has evolved from an academic perspective of customer decision-making in education. This shift marks a paradigm shift in the perceived value of education from abstract theoretical discussions to real-life applications on customer behaviour. Furthermore, it will explore the importance of social media in choosing STEM courses. Nowadays, social media platforms become an integral part of everyday life. It influences parents' and children's educational decisions in many ways. It allows us to think about the deep changes in educational consumer behaviour patterns.

The two main themes of this literature review are perceived value and social media influence. Perceived value, which includes product-related prices, plays a major role in parents' decision-making process. Sweeney and Soutar (2001) found that the various aspects of perceived value, such as performance attributes, quality attributes and emotional gains, are crucial factors in determining the consumer outcome. It suggests that parents might enrol their children on STEM courses if they have a more positive perception of value in these dimensions. The second theme is about the influence of social media. Social media platforms, peer recommendations and marketing campaigns will affect parents' thoughts and ultimately influence their decision to choose the courses for their children. Kaplan and Haenlein (2010) found that there are benefits and difficulties in using social media. It also demonstrated that the means-end model (Zeithaml, 1988) can be used to understand how parents relate the traits of STEM courses to their goals.

Consumer behaviour has completely changed as a result of the exponential growth of social media platforms, with users increasingly relying on peer-generated content and online interactions. (Kaplan and Haenlein, 2010). According to Mangold and Faulds (2009), social media has become a crucial part of the marketing mix which a company uses to influence the demand for its products in the target markets. They also point out that social media allows customers and businesses to communicate in two ways or between customers as well. Companies may not be able to impact customer relations directly, but they can use proper means to influence how they communicate with online conversations to achieve organisational goals. Social media serves a dual purpose which can influence consumer opinions and decisions effectively.

According to Huete-Alcocer (2017), the switch from word-of-mouth (WOM) to electronic WOM (eWOM) has a significant impact on consumer trust and decision-making. In order to further this discussion, Ilieva, Yankova et al. (2024) examine the influence of social media influencers, whose endorsements can have a significant impact on purchasing decisions. This demonstrates how important influencer marketing is to increase brand awareness and sales. In addition, Chen and Xie (2008) highlight the value of online consumer reviews as a cutting-edge form of WOM that provides consumers with personalised guidance in order to make informed decisions. These studies emphasise the important roles that social media and online word-of-mouth play in contemporary consumer behaviour. It also provides opportunities for the marketers.

However, research in these areas is still in its initial stage, especially in STEM disciplines. There is a relatively small body of literature that concerns the unique situation of Hong Kong parents when they decide to enrol their children in STEM courses. This uniqueness includes different cultural and educational values. Further investigation is needed to explore the impact of social media in the context of Hong Kong, particularly in terms of STEM education.

In addition, current research often uses qualitative methods to uncover the complexity of consumer behaviour in the education sector. Future studies should address the limitations of research by adopting the quantitative approach to measure the perceived value and the impact on parental decision-making. It can contribute to our understanding of how these results can be interpreted in the context of Hong Kong's primary and secondary education. Besides, data-driven analysis can help us to reveal how this particular environment works.

Numerous studies have explored the strengths and weaknesses of educational consumer behaviour. Qualitative research provides invaluable insights into how parents make their decisions about choosing courses for their children. However, these findings have limited reliability because of the small sample size and the lack of generalisability. It may also not be applicable to the context of Hong Kong, which has a different culture. To advance knowledge in this area, future studies with different analytical frameworks could better understand consumer behaviour in the education sector.

It is essential for the educational institution to raise the parent's perceived value of STEM courses. It can be done by effectively communicating the academic and social benefits of taking these courses. In addition, social media should be used strategically to influence the parents' decisions, assuming that the contents align with the specific cultural and educational values of the Hong Kong market. This review highlights the significance of exploring the most influential aspects of perceived value and the most effective methods for using social media in marketing.

4 Methodology

The study aimed to evaluate the impact of perceived value and social media effectiveness on parents' decisions to enrol their children in STEM courses. The research hypotheses were:

H₁: Higher product-related perceived values have a positive relationship with the parents' decisions to enrol their children in STEM courses.

H₂: Greater effectiveness of social media marketing has a positive relationship with the parents' decisions to enrol their children in STEM courses.

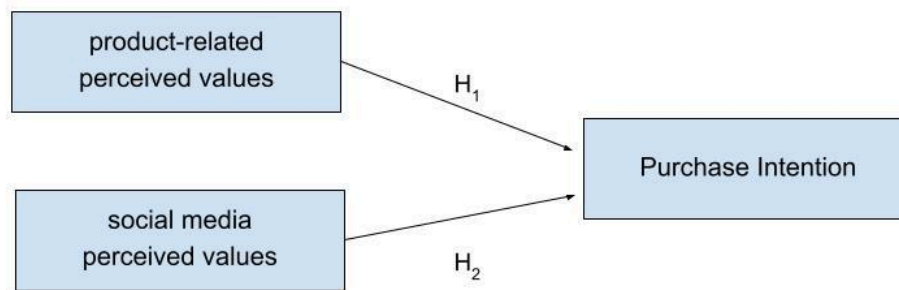


Figure 1

The quantitative approach was used in this study. It utilised a survey questionnaire to collect data from a sample of parents who have enrolled their children in STEM courses in Hong Kong. The survey will measure perceived value, social media influence, and purchase decisions using established psychometric scales adapted for the context of this study. The sample will be selected using random sampling to ensure representation across key demographics.

Methods

We conducted this study in two phases. First, we adopted items and obtained feedback from 10 individuals on all items by conducting a pilot test survey. Second, we tested the revised items with 65 parents and examined each construct scale's reliability and validity.

Item Development

Design

Due to limited time, we didn't develop our items in this study. Instead, we adopted survey items from previous research to measure perceived value, social media and word of mouth (WOM). Five DBA students from different professional backgrounds reviewed the item pool, which has 26 items in total.

Sample

The sample of parents who participated in the study included 65 individuals from the training centre of the Robot Institute of Hong Kong (RIHK), located in Yau Ma Tei, Kowloon. These parents have enrolled their kids in the RIHK robot class. It is believed that they are the primary contact and most likely, they are the decision-makers about enrolment.

We employed two criteria to determine the specific population from which we drew the sample: (1) to ensure that their kids are participating in the RIHK STEM courses and (2) to ensure that they can read the questions in Traditional Chinese.

We collected data using a survey created with Google Forms. All surveys were completed within two days of distribution. Sixty-five surveys were returned, and thanks to the required field function of Google Forms, none were excluded from the study due to incomplete responses. The response rate for the final sample can be calculated as the number of returned responses (65) divided by the total number of surveys distributed (163), yielding a usable response rate of approximately 40 percent ($65/163$). The final sample consisted of 59 females and 6 males. We collected parents' demographic data, including their gender, their children's gender, parents' education level, children's school level, and their grades in school.

Procedures

The survey was distributed via a WhatsApp group. As the investigator, I sent a message with the survey link and explained the purpose of the study. Participants were instructed to fill in the questionnaire anonymously to ensure their comfort. We mentioned that the data would be saved for internal reference only. Each participant received a small gift after submission. They could redeem it by showing a screenshot of the "Thank you" page, which was displayed after submission.

Item Revisions Based on Feedback

We made edits to the items throughout the expert review and pilot test (see Table 1).

Examples of feedback and item Revisions from expert review

Example	Items, before	Issues identified	Revision	Item, After
1	STEM courses help to develop my child's problem-solving skills.	The word "develop" may be too appropriate.	Changed the word "develop" to "improve"	STEM courses help to improve my child's problem-solving skills.
2	The information provided by the STEM course providers on social media is trustworthy.	The word "course information" is too specific	Changed the word "course information" to "information"	The information provided by the STEM course providers on social media is trustworthy

Table 1

Measures

The survey questionnaire included four content areas: product-related value, social media and word-of-mouth (WOM), purchase decision, and parent characteristics. The survey instrument included psychometric scales designed to measure these areas. Product-related value, social media and WOM sections each contained 8 items, while the purchase decision section included 4 items. Each of the multi-item measures was based on a 5-point Likert scale. The complete survey questionnaire is included in the Appendix. The survey distributed to parents uses Google Forms and the questions are written in traditional Chinese.

Pilot Test

In the pilot phase of our study, we assessed the readiness measures through a survey administered to ten individuals, conveniently sampled from my immediate circle. The survey, which covered product-related value, social media, word-of-mouth, and purchase decision sections, was adapted from existing research. It was distributed via WhatsApp, yielding a total response rate of 100% as all ten invited friends completed and returned usable surveys. The reliability of the study was confirmed with a Cronbach's alpha internal consistency coefficient of .83 across 20 questions, indicating that the measures were sufficiently reliable for further analysis.

Limitations

The study is limited by a small sample size ($n=65$) and a specific geographical context. Future research should aim to replicate the study with a more extensive and more diverse sample to validate the findings.

5 Results

Descriptive Results

The results will present the descriptive statistics of the respondents, including their demographic profiles and their ratings on product-related value, social media influence, and purchase decisions.

Descriptives of the sample (n=65)

	Frequency	Percent
Gender		
Male	6	9.2
Female	59	90.8
Child's Gender		
Male	59	90.8
Female	6	9.2
Child is in		
Primary School	55	84.6
Secondary School	10	15.4
Grade		
Grade 1	7	10.8
Grade 2	8	12.3
Grade 3	12	18.5

Grade 4	8	12.3
Grade 5	13	20.0
Grade 6	6	9.2
Grade 7	5	7.7
Grade 8	5	7.7
Grade 9	1	1.5
Learning Duration		
Less than 1 year	28	43.1
1 to 2 years	21	32.3
2 to 3 years	10	15.4
3 to 4 years	2	3.1
More than 4 years	4	6.2
Education Level		
Secondary	13	20
College	10	15.4
Bachelor	25	38.5
Master or above	17	26.2

Table 2

A total of 65 parents completed the survey (Table 2). The majority of respondents were female (90.8%), and the majority of their children were enrolled in primary school (84.6%). The majority of respondents had a bachelor's degree (38.5%).

The measures of central tendency which include means, median and mode and the measures of dispersion which include range, variance and standard deviation are shown in Table 3.

Displays key descriptors of the sample

Descriptives										
	N	Missing	Mean	Median	Mode	SD	Variance	Range	Minimum	Maximum
Gender	65	0	3.91	4	4.00	0.292	0.0851	1	3	4
Q1	65	0	4.02	4	4.00	0.875	0.7654	4	1	5
Q2	65	0	3.65	4	3.00	0.959	0.9197	4	1	5
Q3	65	0	4.23	4	5.00	0.806	0.6490	3	2	5
Q4	65	0	3.55	4	3.00	0.771	0.5947	3	2	5
Q5	65	0	4.22	4	5.00	0.800	0.6404	3	2	5
Q6	65	0	4.31	4	5.00	0.769	0.5913	3	2	5
Q7	65	0	4.08	4	4.00	0.797	0.6346	3	2	5
Q8	65	0	3.42	3	3.00	0.846	0.7154	3	2	5
Q9	65	0	3.78	4	4.00	0.857	0.7341	4	1	5
Q10	65	0	4.00	4	4.00	0.829	0.6875	3	2	5
Q11	65	0	3.49	3	3.00	0.831	0.6913	3	2	5
Q12	65	0	3.94	4	4.00	0.899	0.8087	3	2	5
Q13	65	0	3.98	4	4.00	0.838	0.7029	4	1	5
Q14	65	0	3.86	4	4.00	0.808	0.6524	3	2	5
Q15	65	0	3.85	4	4.00	0.795	0.6322	3	2	5
Q16	65	0	3.95	4	4.00	0.799	0.6385	3	2	5
Q17	65	0	4.00	4	4.00	0.771	0.5938	4	1	5
Q18	65	0	4.28	4	4.00	0.696	0.4846	3	2	5
Q19	65	0	3.68	4	3.00 ^a	1.032	1.0659	4	1	5
Q20	65	0	3.77	4	4.00	0.844	0.7115	3	2	5

^a More than one mode exists, only the first is reported

Table 3

Scale Characteristics

The readiness items were divided among scales representing 3 constructs. Scales for the first three constructs (product-value related, 8 items; social media and WOM, 8 items; Purchase decision, 4 items) were scored using 5-point Likert-type scales (1= strongly disagree, 5=strongly agree).

We conducted an item analysis to determine whether items within scales correlated as predicted and dropped items that did not correlate well within scales. Two measures were considered in the item analysis: (1) Cronbach's alpha for reliability (for the items measuring each construct), and (2) item-rest correlations to identify items that do not correlate well with others in a given scale. We used a minimum threshold of .70 for Cronbach's alpha (Cronbach, 1951) and .20 for item-rest correlation. Statistical analyses were performed using Jamovi (<https://www.jamovi.org/>).

Reliability Analysis

The Cronbach's alpha internal consistency coefficient for the survey was 0.94, indicating acceptable reliability.

Reliability Analysis

Scale Reliability Statistics	
Cronbach's α	
scale	0.940

Table 4

Confirmatory Factor Analysis (CFA)

CFA is often used to validate the structure of a measurement model, where the factors are hypothesised to underlie the observed variables.

Factor Estimates

Factor Covariances							
		Estimate	SE	95% Confidence Interval		Z	p
				Lower	Upper		
Factor 1	Factor 1	1.000 ^a					
	Factor 2	0.594	0.0933	0.411	0.776	6.37	<.001
	Factor 3	0.889	0.0407	0.810	0.969	21.84	<.001
Factor 2	Factor 2	1.000 ^a					
	Factor 3	0.623	0.0902	0.446	0.800	6.90	<.001
Factor 3	Factor 3	1.000 ^a					
^a fixed parameter							

^a fixed parameter

Table 5

Confirmatory Factor Analysis

Factor Loadings							
Factor	Indicator	Estimate	SE	95% Confidence Interval		Z	p
				Lower	Upper		
Factor 1	Q1	0.717	0.0894	0.542	0.892	8.02	<.001
	Q2	0.750	0.1006	0.553	0.947	7.46	<.001
	Q3	0.568	0.0879	0.395	0.740	6.46	<.001
	Q4	0.510	0.0862	0.341	0.679	5.91	<.001
	Q5	0.632	0.0834	0.468	0.795	7.58	<.001
	Q6	0.646	0.0775	0.494	0.798	8.34	<.001
	Q7	0.650	0.0815	0.491	0.810	7.98	<.001
	Q8	0.597	0.0927	0.416	0.779	6.44	<.001
Factor 2	Q9	0.737	0.0887	0.563	0.910	8.31	<.001
	Q10	0.605	0.0924	0.424	0.786	6.55	<.001
	Q11	0.542	0.0950	0.355	0.728	5.70	<.001
	Q12	0.648	0.0993	0.454	0.843	6.53	<.001
	Q13	0.506	0.0993	0.311	0.700	5.09	<.001
	Q14	0.560	0.0926	0.379	0.742	6.05	<.001
	Q15	0.595	0.0894	0.420	0.771	6.66	<.001
	Q16	0.523	0.0905	0.346	0.700	5.78	<.001
Factor 3	Q17	0.674	0.0762	0.525	0.824	8.85	<.001
	Q18	0.618	0.0684	0.484	0.752	9.04	<.001
	Q19	0.727	0.1136	0.504	0.950	6.40	<.001
	Q20	0.502	0.0974	0.311	0.693	5.15	<.001

[4]

Table 6

All factor loadings in Table 6 are statistically significant, as indicated by the p-values less than .001. The factor loadings range from 0.502 to 0.889, suggesting that all observed variables have a significant relationship with at least one latent factor. The factor correlations are also statistically significant, with the highest correlation being between Factor 1 and Factor 3 (0.889), and the lowest being between Factor 2 and Factor 3 (0.623).

In summary, the CFA results suggest that the observed variables are significantly related to their respective latent factors, and there are significant correlations between the factors. This indicates that the measurement model used in this study is structurally valid.

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Inferential Results

Correlation Matrix

Correlation Matrix

		PV	SM	PD
PV	Pearson's r	—		
	df	—		
	p-value	—		
SM	Pearson's r	0.558 ^{***}	—	
	df	63	—	
	p-value	<.001	—	
PD	Pearson's r	0.770 ^{***}	0.556 ^{***}	—
	df	63	63	—
	p-value	<.001	<.001	—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 7

The correlation matrix shows the correlation coefficients between Perceived Value (PV), Social Media (SM), and Purchase Decision (PD). The matrix also includes the degrees of freedom (df) and p-values for each correlation. The analysis is as follows:

1. Correlation between PV and SM:

- The Pearson's r of 0.558 indicates a moderate positive correlation. It suggests that social media efficiency tends to increase as perceived value increases and vice versa.
- The p-value is less than .001, which is highly significant. It suggests that there is a relationship between PV and SM.

2. Correlation between PV and PD:

- The Pearson's r of 0.770 indicates a strong positive correlation. It implies that the potential for making a purchase increases as the perceived value rises and vice versa.
- The p -value is less than .001, which is highly significant. It suggests that there is a relationship between PV and PD.

3. Correlation between SM and PD:

- The Pearson's r of 0.556 indicates a moderate positive correlation. It suggests that the potential for making a purchase decision increases as the influence of social media rises and vice versa.
- The p -value is less than .001, which is highly significant. It suggests that there is a relationship between SM and PD.

In summary, all three correlations are positive. It indicates that higher perceived value and a higher level of social media perceived value are related to a higher likelihood of making a purchase decision. The strength of these relationships varies, with the strongest link being between perceived value and purchase decision ($r = 0.770$), followed by the relationship between social media and purchase decision ($r = 0.556$), and then the relationship between perceived value and social media ($r = 0.558$).

For hypothesis 1 (H1), the significance value is less than 0.01. We reject the null hypothesis and conclude that the product-related perceived values are related to parents' decisions to enrol their children in STEM courses.

For hypothesis 2 (H2), the significance value is less than 0.01. We reject the null hypothesis and conclude that the perceived effectiveness of social media marketing is related to parents' decisions to enrol their children in STEM courses.

T-Tests

Inferential statistics, such as T-tests and ANOVA, will be used to compare means and explore the relationships between the variables.

In order to explore whether the variables of Perceived Value (PV), Social Media (SM), and Purchase Decision (PD) are affected by different demographic characteristics, independent sample t-test and ANOVA analysis were used to examine the differences in Perceived Value (PV), Social Media (SM), and Purchase Decision (PD) among different parent types, child gender, child education level, course participation period and parent education level.

T-Test 1: Gender Differences in STEM Course Purchase Decisions

Independent Samples T-Test								
Independent Samples T-Test								
		Statistic	df	p	95% Confidence Interval			
					Effect Size	Lower	Upper	
PD	Student's t	-1.94	63.0	0.057	Cohen's d	-0.830	-1.78	0.176
Note. H ₀ : μ_1 Male = μ_2 Female								
Group Descriptives								
		Group	N	Mean	Median	SD	SE	
PD	1 Male		6	3.42	3.25	0.904	0.369	
	2 Female		59	3.98	4.00	0.660	0.0859	

Table 8

An Independent Samples T-Test is used to compare the means of two independent groups. In this test (T-test 1), the groups are based on gender, with one group being male and the other female. The variable being tested is purchase decision (PD).

1. Statistical Test Results:

- **P-value:** The p-value is 0.057. This value is close to the conventional significance level of 0.05, suggesting a marginally significant result. This means that there is some evidence to suggest a difference in purchase decisions between males and females, but it is not strong enough to be considered statistically significant at the 0.05 level.
- **Effect Size:** The effect size is -0.830. This is considered a medium to large effect size, indicating that the difference in purchase decisions between the two groups is meaningful.

2. 95% Confidence Interval:

- The 95% Confidence Interval for the difference in means is from -1.78 to 0.176. Since this interval includes 0, it suggests that there is no significant difference between the means of the two groups. However, the interval is very close to excluding 0, which aligns with the marginal p-value.

In summary, the analysis shows a marginally significant difference in purchase decisions between males and females, with females having a higher mean purchase decision score. The effect size is medium to large, indicating a meaningful difference. However, due to the p-value being just above 0.05, we should interpret this result with caution and consider the possibility of a Type I error (false positive). The larger sample size for females ($n=59$) compared to males ($n=6$) suggests that the female group's mean is more reliable.

T-Test 2: Child Gender Impact on STEM Course Purchase Decisions

Independent Samples T-Test

Independent Samples T-Test								
					95% Confidence Interval			
	Statistic	df	p	Effect Size	Lower	Upper		
PD	Student's t	1.29 ^a	63.0	0.202	Cohen's d	0.552	-0.296	1.40
<i>Note.</i> H ₁ μ 1 Boy $\neq$ μ 2 Girl								
^a Levene's test is significant (p < .05), suggesting a violation of the assumption of equal variances								
Group Descriptives								
	Group	N	Mean	Median	SD	SE		
PD	1 Boy	59	3.97	4.00	0.636	0.0827		
	2 Girl	6	3.58	3.63	1.17	0.477		

Table 9

In T-test 2, the groups are based on the child's gender, with one group being parents of boys and the other parents of girls. The variable being tested is the purchase decision (PD).

1. Statistical Test Results:

- **P-value:** The p-value is 0.202. Since this value is greater than the conventional significance level of 0.05, we fail to reject the null hypothesis. This suggests that there is not enough evidence to conclude that there is a statistically significant difference in purchase decisions between parents of boys and parents of girls.
- **Effect Size:** The effect size is 0.552. This is considered a medium effect size, indicating that the difference in purchase decisions between the two groups is meaningful. However, the p-value suggests that this difference is not statistically significant.

2. 95% Confidence Interval:

- The 95% Confidence Interval for the difference in means is from -0.296 to 1.40. This interval includes 0, which further supports the conclusion that there is no significant difference between the means of the two groups.

In summary, the analysis shows no statistically significant difference in purchase decisions between parents of boys and parents of girls. The means are close, and the effect size is medium, but the p-value is greater than 0.05, indicating that any difference in purchase decisions is not practically significant.

T-Test 3: School-Level Effects on STEM Course Purchase Decisions

Independent Samples T-Test

Independent Samples T-Test

		Statistic	df	p	Effect Size	95% Confidence Interval	
						Lower	Upper
PD	Student's t	1.02	63.0	0.314	Cohen's d	0.349	-0.329 1.02

Note. $H_1: \mu_1 \neq \mu_2$ Primary Student * μ_2 Secondary Student

Group Descriptives

		N	Mean	Median	SD	SE
PD	1 Primary Student	55	3.97	4.00	0.706	0.0951
	2 Secondary Student	10	3.73	3.75	0.640	0.202

Table 10

In T-test 3, the Independent Samples T-Test compares the purchase decision (PD) between two groups based on the child's school level: primary students and secondary students.

1. Statistical Test Results:

- **P-value:** The p-value is 0.314. Since this value is greater than the conventional significance level of 0.05, we fail to reject the null hypothesis. This suggests that there is not enough evidence to conclude that there is a statistically significant difference in purchase decisions between parents of primary students and parents of secondary students.
- **Effect Size:** The effect size is 0.349. This is considered a small effect size, indicating that even if there is a difference, it is not very large.

2. 95% Confidence Interval:

- The 95% Confidence Interval for the difference in means is from -0.329 to 1.02. This interval includes 0, which further supports the conclusion that there is no significant difference between the means of the two groups.

In summary, the analysis shows no statistically significant difference in purchase decisions between primary and secondary students. The means are close, and the effect size is small. The larger sample size for primary students (n=55) compared to secondary students (n=10) suggests that the primary group's mean is more reliable, but even with this imbalance, the conclusion remains the same. There is no significant difference in perceived value between the two school levels at the 0.05 significance level.

ANOVA Tests

ANOVA 1: Learning Duration Variation in STEM Course Purchase Decisions

One-Way ANOVA

One-Way ANOVA (Welch's)

	F	df1	df2	p
PD	0.801	4	5.69	0.568

Group Descriptives

	Learning Duration	N	Mean	SD	SE
PD	1 less than 1 year	28	4.00	0.531	0.100
	2 1 to 2 years	21	3.79	0.807	0.176
	3 2 to 3 years	10	4.15	0.503	0.159
	4 3 to 4 years	2	2.75	1.414	1.000
	5 More than 4 years	4	4.25	0.791	0.395

Table 11

A One-Way ANOVA test compares the purchase decision (PD) across five groups based on the child's learning duration. The learning duration is the period for which the child has been enrolled in STEM courses.

Statistical Test Results:

- **F:** The F-value is 0.801. This is the test statistic used in ANOVA to determine if there are any significant differences between the group means.
- **P-value:** The p-value is 0.568. Since this value is greater than the conventional significance level of 0.05, we fail to reject the null hypothesis. It suggests that there is no significant difference in purchase decisions between the different learning duration groups.

In summary, the analysis found that there is no significant difference between the different learning duration events when making buying decisions. According to the F-value and p-value, the variation between the group means is not significantly greater than the variance within the groups. The relatively small sample sizes for groups 4 and 5 ($n=2$ and $n=4$, respectively) may contribute to the lack of statistical significance.

ANOVA 2: Parental Education Level and STEM Course Purchase Decisions

One-Way ANOVA

One-Way ANOVA (Welch's)

	F	df1	df2	p
PD	0.102	3	25.9	0.958

Group Descriptives

	Parent's Education Level	N	Mean	SD	SE
PD	1 Secondary	13	4.02	0.739	0.205
	2 College	10	3.95	0.956	0.302
	3 Bachelor	25	3.88	0.693	0.139
	4 Master or above	17	3.93	0.536	0.130

Table 12

A One-Way ANOVA test compares the purchase decision (PD) between four groups based on the parent's level of education.

Statistical Test Results:

- **F:** The F-value is 0.102. This is the test statistic used in ANOVA to determine if there are any significant differences between the group means.
- **P-value:** The p-value is 0.958. Since this value is greater than the conventional significance level of 0.05, we fail to reject the null hypothesis. It suggests that there is no significant difference in purchase decisions between the different parent's education level groups.

In summary, the analysis finds that there are no statistically significant differences between different parent education level groups when making buying decisions. The F-value is very small, and the p-value is well above the significance level, indicating that the observed differences in means could be caused by random chance. The means are quite close, and there is no clear pattern suggesting that parent's education level has a substantial impact on purchase decisions in this sample.

Regression Analysis

Predicting STEM Course Enrolment from Perceived Value and Social Media Influence

A linear regression analysis was conducted to examine the influence of product-related perceived value (PV) and social media (SM) on parents' decisions to purchase STEM courses for their children (PD). The results supported both hypotheses, indicating that higher product-related perceived values and greater perceived effectiveness of social media marketing are positively related to parents' decisions to enrol their children in STEM courses.

Linear Regression

Model Fit Measures

Model	R	R ²
1	0.785	0.616

Model Coefficients - PD

Predictor	Estimate	SE	t	p	Stand. Estimate	95% Confidence Interval	
						Lower	Upper
Intercept	0.395	0.3788	1.04	0.301			
PV	0.698	0.0993	7.03	<.001	0.667	0.47700	0.856
SM	0.205	0.1052	1.95	0.056	0.185	-0.00502	0.374

Table 13

Model Fit Measures

R: The correlation coefficient of 0.785 indicates a strong positive relationship between the independent variables (PV and SM) and the dependent variable (PD).

R²: The coefficient of determination of 0.616 suggests that 61.6% of the variance in parents' purchase decisions can be explained by the model, which includes perceived value and social media.

Model Coefficients

- Intercept:
 - Estimate: 0.395
 - Standard Error (SE): 0.3788
 - t-value: 1.04
 - p-value: 0.301
 - 95% Confidence Interval: Not significant ($p > 0.05$)

The intercept is not statistically significant, indicating that the expected value of PD when both PV and SM are zero is not reliable.

- PV (Product-Related Perceived Value):
 - Estimate: 0.698
 - SE: 0.0993
 - t-value: 7.03
 - p-value: $<.001$
 - Standardized Estimate: 0.667
 - 95% Confidence Interval: 0.477 to 0.856

The coefficient of PV is 0.698, indicating that for every one-unit increase in PV, PD is expected to increase by 0.698 units, holding SM constant. The p-value is less than .001, which is highly significant, indicating a strong positive relationship between PV and PD. Additionally, the standardised estimate of 0.667 suggests that PV is the primary driver of PD in this model.

- SM (Social Media):
 - Estimate: 0.205
 - SE: 0.1052
 - t-value: 1.95
 - p-value: 0.056
 - Standardized Estimate: 0.185
 - 95% Confidence Interval: -0.005 to 0.374

The coefficient of SM is 0.205, indicating that for every one-unit increase in SM, PD is expected to increase by 0.205 units, holding PV constant. The p-value is 0.056, which is marginally significant (close to the 0.05 threshold), suggesting a positive relationship between SM and PD. The standardised estimate of 0.185 indicates that SM has a smaller effect on PD compared to PV.

Regression Formula

Based on the coefficients provided, the regression formula for predicting PD from PV and SM is:

$$PD = 0.395 + 0.698 \cdot PV + 0.205 \cdot SM$$

Figure 2

The linear regression analysis shows that both product-related perceived value (PV) and social media (SM) positively influence parents' decisions to enrol STEM courses for their children (PD). The model explains 61.6% of the variance in PD, with PV having a stronger effect than SM. The intercept is not statistically significant. The regression formula can be used to predict PD based on PV and SM.

6 Discussion

Education institutions should present the academic benefits and practical applications of participation in STEM courses. Besides, it should make use of social media to share more about the course information. Future studies should address the limitations of this research by including a large sample size which can generalise the findings to a broader population.

The results of the analysis indicate that both product-related perceived value and the effectiveness of social media considerably influence parents' decisions to enrol their children in STEM courses. The strong positive correlation between perceived value and purchase decisions suggests that parents are more likely to enrol their children in STEM courses which have higher product perceived value. The findings of this study offer valuable insight into the factors that influence Hong Kong parents to enrol their children in STEM courses. These findings have a variety of implications, especially for those running an educational business.

First, there is a strong positive correlation between perceived value and parents' decisions to enrol their children in STEM courses. It highlights the importance of better communication. In order to attract more parents and students, educational institutions should present the value proposition of their STEM courses effectively. At the same time, marketers should emphasise the tangible benefits of their STEM courses, such as improved computational thinking skills, problem-solving skills, and the development of coding skills.

Second, social media plays an important role in the parental decision-making process. It suggests that educational institutions need to keep a strong online presence and make better use of social media platforms to deliver their messages to prospective parents. Sharing testimonials, success stories or other relevant educational content will help to build an online community about STEM courses. It is believed that it can encourage parents to enrol their children in the courses.

The findings suggest that parents are influenced not only by the educational value of STEM courses but also by online content. It highlights the potential power of word-of-mouth marketing in the digital era. Education providers can encourage satisfied parents to share their experiences online which may influence other parents' decisions.

In short, in order to attract and retain students in STEM courses, education practitioners and marketers should focus on delivering their values, making use of social media, and exploring the decision-making process of parents. By doing so, they can help to develop a skilled workforce that is capable of addressing the challenges of the 21st century.

7 Conclusion

This study aims to investigate the influence of perceived product-related value and social media marketing on Hong Kong parents' decision-making for enrolling their children in STEM courses. Through quantitative methods and survey questionnaires, this study provides valuable insights into the decision-making dynamics of parents in the Hong Kong education market, especially in the context of STEM education.

The findings of this study show that parents' perceived value of STEM courses is high and strongly positively correlated with parents' decisions to enrol their children in STEM courses. It emphasises the importance of perceived value as a key factor in parental decisions. In addition, the study shows that social media also plays a role in influencing these decisions. The effectiveness of social media marketing is positively correlated with parents' decisions to enrol their children in STEM courses. It highlights the growing influence of digital platforms on educational choices. The study also demonstrated that perceived product-related value and social media influence significantly predicted parents' decisions to enrol their children in STEM courses. Regression analysis suggests that these variables, with perceived value acting as the main driver, could account for the majority of the variation in parents' purchase decisions.

This study contributes to the field of educational marketing in the context of Hong Kong. It provides a quantitative analysis of the factors that influence parent's decisions on STEM course, which has been under-researched. The findings offer actionable insights to educational institutions. Furthermore, this study extends the understanding of social media's role in consumer behaviour in the education sector. It highlights the strategic importance of social media marketing which can influence the consumer perceptions and decisions in the education sector.

Although this study provides valuable insights, it also has limitations. First, as the sample size is only 65, it limits the generalisability of the findings. Future studies with large sample size are needed to verify the results. Second, this study is limited to the geographical context of Hong Kong, which may have unique cultural and educational values that influence parental decision-making. Future studies should replicate this study in other cultural contexts to explore the generalizability of the findings.

In addition, this study relies on self-reported data, which is prone to bias. Future studies may benefit from objective measures or experimental designs to strengthen the validity of the findings. Furthermore, although the study identified social media as an influencing factor, it did not delve into the specific mechanisms or content types within social media that were most effective in influencing parents. This provides an opportunity for further research to explore the nuanced influence of social media on educational decision-making.

Overall, this study revealed the key role played by perceived value and social media in influencing Hong Kong parents' decision to enrol their children in STEM courses. Despite its limitations, this study makes a valuable contribution to both the academic knowledge and practical application of educational marketing. It provides a foundation for further research into the complexity of educational consumer behaviour and the strategic use of digital platforms to influence these decisions.

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10 Appendix I

Questionnaire Questions

Product-Related Value:

1. STEM courses help improve my child's problem-solving skills.
2. STEM courses help improve my child's communication skills.
3. STEM courses effectively improve my child's programming skills.
4. STEM courses help improve my child's mathematical level.
5. STEM courses effectively enhance my child's understanding of key concepts in science, technology, engineering, and mathematics.
6. The hands-on activities in the STEM courses engage my child and enhance their learning experience.
7. STEM courses provide practical skills for my child's future study or career.
8. Considering the benefits of STEM courses, I think the course fees are reasonable

Social Media and Word-of-Mouth (WOM):

9. Social media platforms are effective in helping me find STEM course information
10. It is easy to find information about STEM courses on social media
11. The information provided by the STEM course providers on social media is trustworthy
12. Positive reviews of STEM courses from friends on social media influenced my decision to enrol my child
13. Positive reviews of STEM courses from education experts or other parents on social media affect my decision to enrol my child
14. Social media is more influential than traditional media (e.g., newspapers, school brochures) when learning about STEM courses for my child
15. Social media plays a significant role in my decision to enrol my child in STEM courses
16. Video content on social media, such as YouTube tutorials, enhances my understanding of STEM courses.

Purchase Decision:

- 17. I am likely to recommend STEM courses to other parents.
- 18. I plan to enrol my child in STEM courses again in the future.
- 19. I prioritise STEM courses over other extracurricular activities when allocating my child's time and my family's budget.
- 20. I am likely to purchase additional STEM course resources to supplement my child's learning.

Personal Information:

- 21. Gender
- 22. Child's gender
- 23. Divison
- 24. Child's grade
- 25. Learnig period of STEM Courses
- 26. Parent's education Level

Questions in Traditional Chinese

1. STEM課程有助於提升孩子解決問題的能力。
2. STEM課程有助於提升孩子的溝通技巧。
3. STEM課程能夠有效地提升孩子的程式設計技能。
4. STEM課程有助於提升孩子的數學科成績。
5. STEM課程有效增強孩子對科學、科技、工程和數學關鍵概念的理解。
6. STEM課程中的製作活動能夠吸引孩子並增強他們的學習體驗。
7. STEM課程為孩子未來的學習或職業提供實用的技能。
8. 考慮到STEM課程的好處，課程費用是合理的。
9. 社交媒體平台能有效讓我尋找STEM課程資訊
10. 在社交媒體上很容易找到有關 STEM 課程的信息
11. 舉辦STEM課程的機構，在社交媒體上提供的資訊是值得信賴
12. 為孩子報讀STEM課程之前，我通常都會參考朋友在社交媒體上的評價再作決定
13. 教育專家或其他家長在社交媒體上對 STEM 課程的正面評價，會影響我為孩子報讀課程決定
14. 在我了解 STEM 課程時，社交媒體比傳統媒體（例如報紙、學校宣傳單張）更具影響力。
15. 社交媒體在我決定讓孩子參加 STEM 課程的過程中發揮了重要作用
16. 社交媒體上的影片內容（例如 YouTube 教學）增強了我對 STEM 課程的理解。
17. 我可能會向其他家長推薦 STEM 課程。
18. 我將計劃會再次為我的孩子報讀STEM課程。
19. 在分配孩子的時間和家庭預算時，我會優先考慮 STEM 課程而不是其他課外活動。
20. 我可能會購買額外的 STEM 課程學習資源來加強孩子的學習。
21. 性別
22. 子女性別
23. 學校組別
24. 子女年級
25. 參與STEM課程年份
26. 家長學歷

11 Appendix II

Reliability Analysis

Scale Reliability Statistics

Cronbach's α	
scale	0.940

Item Reliability Statistics

	Mean	SD
Q1	4.02	0.875
Q2	3.65	0.959
Q3	4.23	0.806
Q4	3.55	0.771
Q5	4.22	0.800
Q6	4.31	0.769
Q7	4.08	0.797
Q8	3.42	0.846
Q9	3.78	0.857
Q10	4.00	0.829
Q11	3.49	0.831
Q12	3.94	0.899
Q13	3.98	0.838
Q14	3.86	0.808
Q15	3.85	0.795
Q16	3.95	0.799
Q17	4.00	0.771
Q18	4.28	0.696
Q19	3.68	1.032
Q20	3.77	0.844