The Relationship between Live Streaming and Consumers' Purchase Intention in Perak

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Abstract

Live-streaming services have been adopted as a direct marketing method by many small individual sellers. The emergence of the COVID-19 epidemic has brought about a trend toward online shopping, creating consumer interest in new online shopping habits. Most previous studies have focused on consumers' purchasing behavior towards e-commerce live streaming and online shopping, but these studies still need clarification. This study investigates the relationship between live streaming and consumers' purchase intention in Perak. The objective is to determine the level of live streaming and the level of consumers' purchase intention and investigate the relationship between live streaming and consumers' purchase intention in Perak. This study used the Theory of Planned Behavior (TPB) model as a theoretical foundation. The data have been collected by distributing survey questionnaires to Perak consumers using a quantitative method. 384 questionnaires have been distributed online to Perak consumers via Google Forms. There were 286 questionnaires returned and analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. The analysis shows that all the hypotheses are achieved at Spearman's rho correlation test. This study found a positive and significant relationship between the independent variables (live streaming, such as streamer's credibility, media richness, and interactivity) and the dependent variable (consumers' purchase intention). Therefore, this study has provided valuable insights for online marketers and future academic researchers to understand the relationship between live streaming and consumers' purchase intention.

1. Introduction

In recent years, live-streaming services have been adopted as a direct marketing method by many small individual sellers (Wongkitrungrueng & Assarut, 2020). Live streaming allows shoppers to interact with sellers in real time, leading to a more immersive and engaging shopping experience (Cai *et al.*, 2018). In contrast with other live-streaming platforms, live-streaming is an e-commerce platform with a strong result-oriented goal of increasing sales (Song & Liu, 2021). Many live-streaming platforms exist, such as Facebook Live, TikTok Live, Instagram Live, and other social application apps (Rezek, 2022).

Malaysians use online platforms more frequently, with an average of growing by 1.9 times used per person in 2021 and 2022. Based on Mentek (2021) reports that approximately 28 million Malaysians use social media. Internet penetration has increased, and consumers are starting to shop online, leading to the rapid growth of

mobile commerce and e-commerce (Pop *et al.*, 2023). The popularity of live streaming worldwide has increased in recent years. During e-commerce live streaming, e-commerce transactions and activities can be carried out via a live-streaming platform (Xu *et al.*, 2020). Sun *et al.* (2019) proposed live-streaming shopping as an excellent new form of social commerce for research. In addition, very few studies have examined the influence of live streaming on consumer purchase intention. Evidence shows that live streaming boosts customer engagement (Wongkitrungrueng & Assarut, 2020). However, it still needs to be determined whether live streaming will improve social commerce purchase intentions. Therefore, there is potential to explore consumers' purchase intentions in live streaming.

In consumer behavior research, consumer perception, as the internal cognitive states of individuals, plays an active role in formulating purchase intentions (Lidija *et al.*, 2020). Generally, purchase intentions result from consumer behavior, perceptions, and attitudes concerning consumers' access and evaluation of specific products. In live streaming, various factors affect the purchase process, such as the streamer's credibility, media richness, and interactivity (Song & Liu, 2021). Streamer's credibility has only been found to positively impact purchase behavior in live-streaming commerce based on the audience's perception of the streamer's attractiveness, expertise, and trustworthiness (Xu *et al.*, 2020). In live streaming, appearance, performance, and personality will influence the streamer's attractiveness. Media richness positively predicted social presence and social presence positively predicted continuance intentions (Wang, 2022). Sun *et al.* (2019) explained live streaming interactivity through meta-voicing affordances. Consumers were provided with a sense of immersion and presence, which increased consumers' purchase intention.

1.1 Problem Statement

One of the main issues is that the emergence of the COVID-19 pandemic influenced a change in consumer purchase intentions. The emergence of the COVID-19 epidemic has brought about a trend toward online shopping, creating consumer interest in new online shopping habits (Valaskova *et al.*, 2021). The COVID-19 pandemic has led to the country's lockdown, and social distance between people has hampered consumers' purchasing of daily essentials. Many consumers exhibited panic or impulsive buying behaviors during the early stages of the COVID-19 pandemic (Stuart *et al.*, 2021). Consumers even displayed compulsive purchasing behavior (Celik & Kose, 2021).

According to May *et al.* (2022), recent research shows that growth across all platforms has slowed from last year. To prevent the spread of COVID-19, people reduce their exposure to crowds and shop online to meet the needs of daily life. In addition, regardless of the growing trend in live-streaming popularity among consumers, there needs to be more research examining the impact between live-streaming and customer purchase intention (Yu *et al.*, 2018). Previous studies mainly focusing on consumers' purchase behaviors towards live e-commerce and online shopping still need to be clarified. There are few statistics on live streaming preferences on consumers' purchase intention in the Malaysian market.

Moreover, based on some empirical results from previous studies found that streamer's credibility, media richness, and interactivity toward consumers' purchase intentions are strongly correlated (Song & Liu, 2021; Liu, 2022; Asyraf Hasim *et al.*, 2020; Ma *et al.*, 2022). In contrast, Liao *et al.* (2022) failed to establish a relationship between streamer's credibility, media richness, and interactivity toward consumers' purchase intentions. Moreover, Liu *et al.* (2022) found no correlation between streamer's credibility, media richness, interactivity, and perceived risk toward consumers' purchase intentions and called for more reliable measures in future studies. As a result, this study aims to fill the research gaps in Perak by examining the relationship between live streaming (streamer's credibility, media richness, and interactivity) and consumers' purchase intentions.

Therefore, to achieve the research objectives the level of live streaming and the level of consumers' purchase intention in Perak are determined. Consequently, the relationship between live streaming and consumers' purchase intention in Perak is identified.

1.2 Significance of study

Firstly, the study provides a better understanding of the relationship between live streaming and consumers' purchase intention in Perak. Moreover, live streamers might have gathered insight into their users' buying behavior to help boost e-commerce in Malaysia. Secondly, this study can benefit future researchers. This study provides valuable references for future researchers planning such studies. The study will also be helpful to live-stream sellers, online vendors, and businesses that still need to take advantage of live-stream commerce. The study proposes a new business model that benefits both online and traditional suppliers to small businesses. Live streaming sellers can improve relevancy to attract more revenue and sales. Last but not least, the study contributes to the body of knowledge about live-streaming. This study's findings guide relevant parties or scholars to examine the streamer's credibility, media richness, and interactivity toward consumers' purchase intention.

1.3 Scope of study

This study aims to identify the relationship between live streaming (streamer's credibility, media richness, and interactivity) and consumers' purchase intention in Perak. The unit of analysis focuses on Perak consumers. There is a lack of studies about the relationship between live streaming and consumers' purchase intention in Perak. The questionnaires were used to capture the data on the relationship between live streaming and consumers' purchase intention in Perak. The questionnaires were distributed online through social media such as Facebook, WhatsApp, WeChat, and other social applications. A five-point Likert scale was used in this study, and respondents were asked to rate their level of agreement or disagreement with each survey item. Using the table by Krejcie and Morgan (1970) to determine sample size, a total of 384 respondents from Perak consumers were required to answer the questionnaire researchers developed based on the total population of 2,496,041 consumers in Perak.

2. Literature Review

2.1 Consumers' Purchase Intention

Purchasing intention refers to the intent to make a purchase, such as buying a product or service (Marlien *et al.*, 2021). Consumers' purchasing intentions for private label products may threaten the popularity of branded products. Besides that, Sun *et al.* (2019) defined consumer purchase intention as the intention of a consumer to buy goods or services from a seller through live streaming. In live-streaming e-commerce, purchase intention determines whether consumers purchase products (Liu *et al.*, 2022). Understanding consumers' purchase intentions is crucial for predicting their behavior, and purchase intentions depend upon many factors, making measurement challenging in many situations. Generally, purchase intention is often used to predict customers' buying activity (Kamalul Ariffin *et al.*, 2018). Moreover, consumers' purchase intentions are understood to be consumers' intention to purchase a product online in the live-streaming context. In live streaming, consumers' purchase intention is directly related to determining whether they will purchase. Therefore, understanding the influence of purchase intention is significant in live-streaming marketing and crucial for marketers and businesses. This study examined the relationship between variables such as live streaming and consumers' purchasing intention in Perak.

2.2 Live Streaming

2.2.1 Streamer's Credibility

Credibility refers to the belief that a customer has in an advertisement's authenticity, integrity, and reliability (Rajesh *et al.*, 2019). Online communities' credibility can be measured through the trustworthiness of the content and information produced (Hajli, 2018). Consumer attitudes are positively influenced by advertising credibility in the online environment (Gaber *et al.*, 2019). According to Arora and Agarwal (2019), credible advertisements can positively influence consumers' attitudes and behavior. Furthermore, the credibility of advertising plays a significant role in positively influencing customer sentiments and is considered one of the main sources of advertising value in the online environment. (Gaber *et al.*, 2019). Arora and Agarwal (2019) found that credible advertisements positively affected consumers' behaviors and attitudes. A study on social media advertising showed that credibility affects consumers' perception of advertising's value, influencing consumers' purchase intention (Gaber *et al.*, 2019).

2.2.2 Media Richness

Media richness refers to the contribution of varying amounts of content to transmitting and delivering information (Li *et al.*, 2021). Media is used to deliver information and give consumers a perception of it. From the perspective of information dissemination, different media have diverse effects on the ability of information to be communicated. Media richness includes the richness of expression, content, and quality information. The richness of information expression refers to the degree to which the platform provides learners with information, such as pictures, text, and audio. An information platform's information content richness is determined by how well it can meet the needs of learners in terms of the quality of information it provides. The level of information quality and dependability that students receive from the platform is referred to as information quality richness (Wang, 2022). Media richness can be determined by the media quality and the platform, which predicts participation intention (Lee *et al.*, 2018). Hasim *et al.* (2020) found a positive relationship between social media richness and purchase intention. As a result of consumers being exposed to a social media platform with high media richness, they intend to purchase when consumers positively influence social media richness, such as attractiveness, content, and interface. Moreover, consumers are triggered by live-

streaming platforms' attention-grabbing nature in promoting and selling a product online, leading to purchase intentions.

2.2.3 Interactivity

According to Liu *et al.* (2022), interactivity is defined as the ability of consumers to interact with the source of information, emphasizing two-way communication. Ma *et al.* (2022) defined interaction as a reciprocal communication between two parties with a specific level of depth and intensity. Regarding e-commerce, live-streaming shopping can be classified as an interaction-based type of e-commerce. Real-time interactions are possible with sellers and other shoppers in live-streaming shopping. Interaction is the level and richness of interaction between two parties in a conversation (Kang *et al.*, 2021). As a result of live-stream commerce, sellers can provide customers with personalized information and become more responsive to their inquiries. Interactive features enhance communication quality and reduce consumption uncertainty in live-streaming and e-commerce marketplaces (Hou *et al.*, 2019). Live streaming offers real-time immersion, synchrony, a virtual community, and authenticity of experience, in contrast to traditional social media platforms like Facebook, Twitter, Weibo, and WeChat (Li *et al.*, 2018; Wongkitrungrueng & Assarut, 2020). The interactive and participatory nature of live-streaming platforms has sparked widespread interest and intensive academic debate. A live-streaming platform is more significant since it allows various stakeholders to participate and co-create value (Yang *et al.*, 2022). Thus, this study investigated the relationship between interactivity and consumers' purchase intention.

2.3 Underpinning Theory

2.3.1 Theory of Planned Behavior

According to the Theory of Planned Behavior (TPB), purchase intention is the key factor that affects consumer buying behavior. TPB enables the prediction and understanding of individual and environmental factors influencing online shopping behavior. Ajzen (1985) introduced TPB as one factor influencing behavioral intentions and attitudes toward those intentions. This study translated consumer intentions into a live-streaming behavior indicator of purchase intentions based on consumers' willingness to engage in specific behavior. TPB has been selected to discuss and explain the relationship between live streaming (streamer's credibility, media richness, and interactivity) and consumers' purchase intention. TPB indicates that behavioral intentions are affected by attitude, subjective norms, and perceived behavioral control. People's purchase intentions to participate in live streaming will be examined by using TPB in this paper, and the traditional TPB model will be extended by analyzing three factors such as the streamer's credibility, media richness, and interactivity value as TPB variables, to predict people's behavior intention to purchase in live-streaming.

Previous studies found that source credibility often encompasses three key dimensions: trustworthiness, expertise, and attractiveness (Ohanian, 1990). The recipient's perception largely determines the credibility of a message. The credibility of a source can elicit a positive attitude towards the product (Muda & Hamzah, 2021). Source credibility hinges on the communicator's expertise, trustworthiness, and attractiveness. A source with enhanced credibility correlates with a higher likelihood of making a purchase. Thus, the streamer's credibility has been introduced as a factor within the TPB model in this study.

Based on the TPB, media richness consumers perceive should be related to consumer attitudes. Indeed, the Media Richness Theory states that people strive to obtain the appropriate fit between the nature of the information presented by the medium and the type of task they intend to perform (Brunelle, 2010). Additionally, consumer behavior studies show that attitudes vary according to channel and product category (Teo, 2006). Media richness theory also bases media richness on immediate feedback, language variety, personal focus, and multiple cues (Tseng *et al.*, 2022). Live streaming's immediate feedback, speaking variety, individual focus, and multiple cues also correspond to TPB factors when shaping behavioral intentions. Thus, the relationship between media richness and consumer purchase intentions can be analyzed by understanding how live-streaming features affect these TPB variables.

According to Cai *et al.* (2018), compared to traditional e-commerce, online commerce is more reliant on real-time social interactions, which is an important feature of live streaming. The enjoyment of interaction and staying ahead of emerging trends are critical motivators for consumers to engage with live streaming. Furthermore, previous research indicates that interactivity can influence attitude, perceived behavioral control, and subjective norms in the TPB model (Zhang & Chen, 2023). Therefore, interactivity has been introduced as a factor within the TPB model in this study.

2.4 Hypothesis Development

This research identifies the relationship between three dimensions of independent variables (live streaming), such as streamers' credibility, media richness, interactivity, and consumers' purchase intention in Perak. These hypotheses are formulated according to past empirical studies with this goal in mind:

H1: There is a positive relationship between streamer's credibility and consumers' purchase intention in Perak.

H2: There is a positive relationship between media richness and consumers' purchase intention in Perak.

H3: There is a positive relationship between interactivity and consumers' purchase intention in Perak.

2.5 Research Framework

As a conceptual framework, the diagram displays dependent and independent variables, linking or connecting them to create a test for this study. Based on the literature review, Fig. 1 illustrates three dimensions influencing consumers' purchase intentions for live streaming. The three dimensions of independent variables include the streamer's credibility, media richness, and interactivity, whereas consumers' purchase intention in Perak will be the dependent variable.
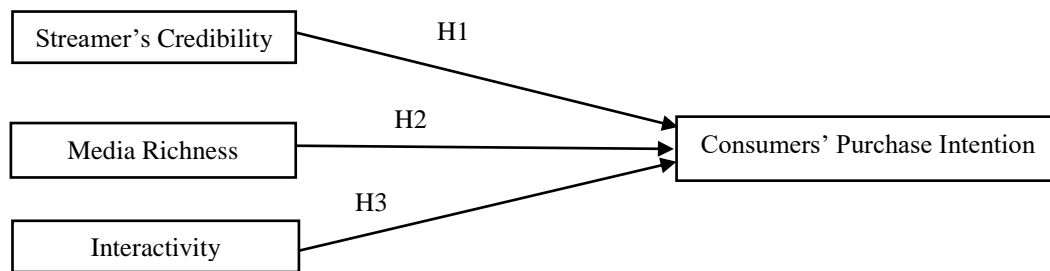

Fig. 1 *Research framework*

3. Research Methodology

3.1 Research Design

Research design is a method or strategy researchers use to answer a research question based on a philosophy, methodology, and methods (Chun Tie *et al.*, 2019). Researchers used descriptive analysis to identify data and characteristics about the studied population or phenomenon by analyzing quantitative data. The method of data collection used in descriptive research studies is unique. A questionnaire is distributed to a person to gather the person's actual and precise figures.

3.1.1 Quantitative Study

In quantitative research, numerical data is collected and analyzed to explain, predict, or control variables and phenomena of interest (Gay *et al.*, 2009). This research investigated the relationship between live streaming (streamer's credibility, media richness, and interactivity) and consumers' purchase intention. In this research, researchers need to collect a large number of respondents to seek how the relationships of each variable are built and verified as the questionnaire is used and will be distributed online. Thus, quantitative research is selected as it is required to gather numerical data on all variables.

3.1.2 Survey Method

The data collection phase in this study has been conducted using a survey. The main reasons for questionnaires being widely used for data collection are because of that cost-effectiveness and efficiency. The researcher used a questionnaire to gain insight into Perak consumers' perspectives and opinions. The questionnaire investigates the relationship between live streaming and consumers' purchase intentions, focusing on the streamer's credibility, media richness, and interactivity. The questions' design was considered before piloting the questionnaire type to ensure they were relevant and acceptable. As a result, surveys can also be performed through relevant surveys and document reviews in numerical form, which can be translated into appropriate statistics. 384 questionnaire sets have been distributed to designated respondents using Google Forms. Online survey questionnaires were distributed via Facebook, WhatsApp, WeChat, and other social applications.

3.2 Respondent

Identifying the respondent for this research requires two procedures which are identifying the population in the vicinity and selecting the sample.

3.2.1 Population

Majid (2018) defines the target population as the population from which a sample will be taken and the study conducted. Academics use it to reach conclusions after collecting a variety of elements. The target population for this research is Perak consumers. The research focuses on gathering data from consumers in Perak state, which is in the geographical region of the researchers. According to the Department of Statistics Malaysia (2020), Perak has a population of 2,496,041. Perak is one of the fourth most populous states in Malaysia. Perak was selected as the target population for the study due to time constraints.

3.2.2 Sample

Sampling is the process of selecting individuals or sampling units from a sample frame (Martínez-Mesa *et al.*, 2016). The Krejcie and Morgan table suggests that 384 samples would be sufficient for a population of 1,000,000 or more. Thus, 384 respondents were selected from a total population of 2,496,041and questionnaires were distributed online via the Google Forms survey method. The targeted respondents of this study are consumers in Perak. Since there is no sampling frame for this population, non-probability sampling was selected. This study used convenience sampling because it is usually easy to conduct with readily available subjects.

3.3 Instrumentation

A questionnaire is being used in this study and distributed online since it can quickly reach a large number of respondents, including Perak consumers. The researcher needs to select an appropriate research instrument. The questionnaire consists of three sections. Section A is about the respondents' demographic profile, which includes gender, age, race, online shopping experience (years), frequency of watching live streaming shopping (times/week), and monthly disposable income. Section B contains 21 questions about the independent variable of research, which is live streaming, such as the streamer's credibility, media richness, and interactivity. Section C includes five questions about the dependent variable: consumers' purchase intention. The instrument was created in the Likert scale style in sections B and C, with a five-scale ranging from "Strongly Disagree", "Disagree", "Neutral", "Agree", and "Strongly Agree". Respondent demographics were collected using multiple-choice questions in Section A.

3.4 Measurement of Variables

The researcher used a questionnaire developed by Song and Liu (2021) and Liu *et al.* (2022) intending to answer the research questions and as a tool for collecting primary data. All measurements were determined based on previous literature and directly adopted as appropriate for the live-streaming environment.

3.4.1 Nominal Scale

According to Stevens (1946), measurement is a method that assigns numbers to attributes. A nominal scale can be used to divide subjects into different groups. This questionnaire scale is used in Section A to measure the demographic profile of respondents, such as gender, age, and race. The respondents were also required to use a nominal scale to answer the items in section A.

3.4.2 Ordinal Scale

Ordinal scales are measurements in which the data are ranked in order instead of showing the interval between rankings (Sekaran, 2013). Consequently, this allows subjects to be arranged according to a concept. Section A measures respondents' demographic profiles through ordinal scales, such as online shopping experience, frequency of watching live-stream shopping, and monthly disposable income.

3.4.3 Interval Scale

An interval scale indicates and measures distances and orders based on a mechanism of equal units, while zero is not considered absent (Saunders *et al.*, 2012). Generally, a Likert scale can be classified as an interval scale for measuring. Based on this research's dependent and independent variables, a five-point Likert scale of questions is applied in Sections B and C. The respondents were also required to use the instrument using a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) in Section B and Section C.

3.5 Validity and Reliability

The validity of the information collected explains how well the information covers the actual area of investigation. Furthermore, the reliability test measures the degree to which it is error-free and ensures a constant measurement over time and with various items in the tool (Sekaran, 2013). This study performs a reliability test using Cronbach's Alpha Coefficient rule of thumb shown in Table 1.

Table 1 *Internal consistency with cronbach's alpha range*

Cronbach's Alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

3.6 Pilot Test

Cronbach's Alpha is used to test both independent and dependent variables in the questionnaire given to the target respondents in the pilot test. A pilot test was carried out using 20 sets of questionnaires distributed to assess the instrument's reliability. Table 2 shows both variables with Cronbach's Alpha reliability test (α) and the number of questions. For the Cronbach's Alpha reliability test (α), all the reliability tests for three dimensions for the independent and dependent variables are more than 0.700, meaning all the variables are highly correlated. Therefore, all the variables are acceptable in this study. The questionnaire was commonly regarded as being readable and easy to understand in the pilot test sample. As a result, no problems were detected with the survey questionnaire, and the questionnaire was finalized.

Table 2 *Reliability statistic pilot test*

Variables	Cronbach's Alpha (α)	Number of Question
Independent Variables		
Streamer's Credibility (SC)	0.866	12
Media Richness (MR)	0.723	4
Interactivity (I)	0.740	5
Dependent Variable		
Consumers' Purchase Intention (CPI)	0.855	5

3.7 Analysis of Data

A structured questionnaire was used to collect data from Perak consumers. This study identifies the relationship between live streaming (streamer's credibility, media richness, and interactivity) and consumers' purchase intention in Perak. After the pilot test, a descriptive and correlation analysis was conducted using the SPSS version 27 software application.

3.7.1 Descriptive Analysis

Descriptive analysis is a method of analyzing data by quantitatively describing, transforming, and summarizing raw data (LoBiondo-Wood & Haber, 2014). There are several types of descriptive statistics, including measures of central tendency such as mean, median, mode, and range. In addition, there are measures of variability, such as standard deviation and coefficients of variation. Tables have been used to present the descriptive analysis, which is more visually appealing and clearly illustrates the proportions. An analysis of demographic data is conducted in this study using descriptive analysis. According to Wiersma (2000), the mean value falls within the range of 1.00 to 2.33 is considered low, while a mean value between 2.34 and 3.67 is categorized as moderate. A mean value ranging from 3.68 to 5.00 is classified as high.

3.7.2 Correlation Analysis

Correlation analysis investigated the relationship between independent variables (live streaming, such as streamer's credibility, media richness, and interactivity) and dependent variables (consumers' purchase intention). Thus, researchers can examine whether the relationship between a dependent variable and the independent variable has a positive relationship, a negative relationship, or no correlation. Table 3 shows the correlation coefficient table.

Table 3 *Correlation coefficient*

Correlation Coefficient	Strength Description
± 0.81 to ± 1.00	Strongest
± 0.61 to ± 0.80	Strong
± 0.41 to ± 0.60	Moderate
± 0.21 to ± 0.40	Weak
± 0.00 to ± 0.20	Weak to No Relationship

Source: Hair et al (2010b)

4. Data and Analysis

4.1 Data Collection Process and Survey Response

According to the Department of Statistics Malaysia (2020), Perak has a population of 2,496,041. The sample size was drawn from Krejcie and Morgan's (1970) table for sample size determination; a total of 384 respondents from Perak consumers were selected to serve as the study sample. The researchers collected data during the data collection period, mainly through Facebook, WhatsApp, WeChat, and other social applications. The data collection period took about three months between August to October 2023. After three months of the data collection process, a total of 286 questionnaires were duly completed and returned, representing a 74.5 percent response rate. Therefore, the data was keyed into Statistical Package for Social Science (SPSS; version 27) for the analysis. The study uses SPSS due to the large sample size and reasonably normal distribution of the data. Table 4 shows the response rate on distributed questionnaires.

Table 4 *Response rate on distributed questionnaires*

Responses	Rates
Population	2,496,041
Sample Size	384
Questionnaire distributed	384
Questionnaire collected	286
Percentages	74.5%

4.2 Non-Response Bias

A test procedure based on that proposed by Armstrong and Overton (1977) was used to determine whether early and late respondents had similar characteristics. Firstly, the 286 respondents were divided equally between early and late responders based on timestamps. Secondly, a paired-sample t-test was performed to determine if there were significant differences between the two groups. As shown in Table 5, the results reveal no significant difference between early and late respondents. The results indicate that there are small statistical differences between the items. They need to be more significant to impact the overall results. Therefore, the differences are not too large, and there is no nonresponse bias. Statistical analysis indicates that no significant nonresponse bias exists in the data.

Table 5 *Paired sample t-test comparison between early respondents and late respondents*

Variable	Response	N	Mean	Std. Deviation	t-value	Sig.
Streamer's Credibility	Early	143	4.1311	0.54083	2.036	0.044
	Late	143	3.9971	0.53097		
Media Richness	Early	143	3.9283	0.62421	0.169	0.866
	Late	143	3.9161	0.65538		
Interactivity	Early	143	4.035	0.64056	-1.198	0.233
	Late	143	4.1273	0.64329		
Consumers' Purchase Intention	Early	143	3.9538	0.75645	0.261	0.794
	Late	143	3.9301	0.73667		

4.3 Data Cleaning

Data cleaning is very important when performing multivariate analysis. This researcher used SPSS version 27 for coding, screening, and other preliminary analyses. All the 286 usable questionnaires were coded and entered into the SPSS variable view page. Each question was coded according to its main variable code and its serial position with other items in the same latent construct. Five questions measuring consumers' purchase intention

were coded as CPI_1, CPI_2, CPI_3, CPI_4, and CPI_5. All other variables in the study were analyzed using the same technique. Therefore, missing data and outliers were treated carefully and thoroughly.

4.3.1 Detection of Missing Data

Take advantage of the Google Forms online survey, which allows Google Forms to set questions that must be answered. Therefore, no missing responses were found in the returned questionnaires. However, the data also needs to be analyzed to ensure that no careless mistakes are made during the data entry process. The researcher analyzed the questionnaire overall using the frequency command in SPSS version 27. According to the statistical table, there were no missing values. Therefore, all 286 respondents were included in the subsequent data analysis.

4.3.2 Outliers Analysis

In this study, the researchers used the approach to transform the value to the other non-outliers. Following this criterion for detecting outliers, 6 values were identified using standardized values as potential univariate outliers (i.e., SC35, SC101, SC202, MR236, I101, and CPI35); these were transformed the value to the other non-outliers. First, SC35, SC101, and SC202 have outliers of 2.58, 2.75, and 2.00, respectively, while the next lowest value (non-outlier) is 2.83, then SC35, SC101, and SC202 would change to 2.83. Second, MR236 has outliers with a value of 1.75, and the next lowest value (non-outlier) is 2.00, then the MR236 would change to 2.00. Third, I101 has outliers with a value of 2.00, and the next lowest value (non-outlier) is 2.20, then the I101 would change to 2.20. Lastly, CPI35 has outliers with a value of 1.00, and the next lowest value (non-outlier) is 2.00, then the CPI35 would change to 2.00. The research will have no outliers after transforming the value to the other non-outliers. Thus, all 286 respondents were included in the final analysis.

4.4 Reliability Analysis

Table 6 shows the reliability analysis for the actual study. The streamer's credibility and interactivity have good reliability, while the media richness has acceptable reliability in this study. Consumers' purchase intention shows excellent reliability. The results indicate that the questionnaire is a reliable research instrument with a reliability level greater than 0.700.

Table 6: *Reliability analysis actual study*

Variables	Cronbach's Alpha (α)	Number of Question	Interpretation
	Independent Variables		
Streamer's Credibility (SC)	0.873	12	Good
Media Richness (MR)	0.783	4	Acceptable
Interactivity (I)	0.844	5	Good
	Dependent Variable		
Consumers' Purchase Intention (CPI)	0.914	5	Excellent

4.5 Descriptive Analysis of Demographic

The purpose of descriptive analysis is to summarize or describe data obtained from the surveys in ways that are useful and identify the demographic characteristics of the respondents of this study, such as gender, age, race, online shopping experience (years), frequency of watching live-streaming shopping (times/week), and monthly disposable income. Table 7 shows that the majority of respondents are female (64.7%), aged between 18-24 years old (45.1%), and Chinese (74.5%). Most Perak consumers have 2-3 years of online shopping experience (38.8%) and watch live shopping 1-2 times per week (58.4%). Most respondents had a disposable income of below RM 2000 per month (53.5%).

Table 7 *Descriptive analysis data*

Item	Frequency	Percent (%)
Gender		
Male	101	35.3
Female	185	64.7
Age		
18-24	129	45.1
25-30	87	30.4
31-36	40	14.0

37-45	18	6.3
46-50	6	2.1
51 or above	6	2.1
Race		
Malay	62	21.7
Chinese	213	74.5
Indian	11	3.8
Online shopping experience (years)		
1 or less	29	10.1
2-3	111	38.8
4-5	96	33.6
6-7	23	8.0
8 or above	27	9.4
Frequency of watching live-streaming shopping (times/week)		
1-2	167	58.4
3-4	70	24.5
5-6	25	8.7
6 above	24	8.4
Monthly disposable income		
Below 2000	153	53.5
2000-3000	114	39.9
3001-4000	11	3.8
4000 above	8	2.8
Total	286	100.0

4.6 Descriptive Analysis of Independent Variables and Dependent Variable

All the variables such as the streamer's credibility, media richness, interactivity, and consumers' purchase intention, reflect a high level, as shown in Table 8.

Table 8 *Descriptive analysis data*

	N	Mean	Standard Deviation	Level
Independent Variable				
Streamer's Credibility	286	4.0699	0.52203	High
Media Richness	286	3.9231	0.63607	High
Interactivity	286	4.0818	0.64030	High
Dependent Variable				
Consumers' Purchase Intention	286	3.9455	0.73382	High

4.7 Normality Test

Table 9 shows the Kolmogorov-Smirnov and Shapiro-Wilk test that the significant value for each dimension, which is the streamer's credibility, media richness, interactivity, and consumers' purchase intention is 0.000, which explains that all the data are non-normal (p-value < 0.01).

Table 9 *Kolmogorov-Smirnov and Shapiro-Wilk Tests*

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Streamer's Credibility	0.100	286	0.000	0.964	286	0.000
Media Richness	0.136	286	0.000	0.958	286	0.000
Interactivity	0.117	286	0.000	0.955	286	0.000
Consumers' Purchase Intention	0.131	286	0.000	0.953	286	0.000

4.7.1 Statistic Method

Table 10 shows the statistics result for the normality data of each variable.

Table 10 *Normality data*

	N	Mean	Standard Deviation	Skewness		Kurtosis	
				Statistic	Std. Error	Statistic	Std. Error
Streamer's Credibility	286	4.0699	0.52203	-0.526	0.144	-0.318	0.287
Media Richness	286	3.9231	0.63607	-0.577	0.144	0.155	0.287
Interactivity	286	4.0818	0.64030	-0.473	0.144	-0.411	0.287
Consumers' Purchase Intention	286	3.9455	0.73382	-0.559	0.144	-0.295	0.287

4.8 Correlation Analysis

This study used Spearman's rho because the data were non-normal. The correlation between the streamer's credibility and consumers' purchase intention is 0.630, and the p-value < 0.01. Thus, there is a strong and positive correlation between the streamer's credibility and consumers' purchase intention. The correlation between media richness and consumers' purchase intention is 0.603, and the p-value is < 0.01. So, a moderate and positive correlation exists between media richness and consumers' purchase intention. The correlation between interactivity and consumers' purchase intention is 0.721, and the p-value is < 0.01. Hence, there is a strong and positive correlation between interactivity and consumers' purchase intention. Table 11 shows the level of correlation coefficient in detail.

Table 11 *Level of correlation coefficient*

Item	Correlation Coefficient	Level
Correlation between streamer's credibility and consumers' purchase intention.	0.630**	Strong
Correlation between media richness and consumers' purchase intention.	0.603**	Moderate
Correlation between interactivity and consumers' purchase intention.	0.721**	Strong

**. Correlation is significant at the 0.01 level (2-tailed).

4.9 Summary of the Hypothesis Testing

The outcome indicates that the correlation coefficient of the streamer's credibility is 0.630 (p-value < 0.01), media richness is 0.603 (p-value < 0.01), and interactivity is 0.721 (p-value < 0.01). As a result, the study accepted or supported the H1, H2, and H3 hypothesis. Detailed results of the summary hypothesis testing are shown in Table 12.

Table 12 *Summary of the hypothesis testing*

Hypothesis	Spearman's Correlation	P-value (sig.)	Summary
There is a positive relationship between streamer's credibility and consumers' purchase intention in Perak.	0.630**	0.000	Accepted/ Supported
There is a positive relationship between media richness and consumers' purchase intention in Perak.	0.603**	0.000	Accepted/ Supported
There is a positive relationship between interactivity and consumers' purchase intention in Perak.	0.721**	0.000	Accepted/ Supported

**. Correlation is significant at the 0.01 level (2-tailed).

5. Discussions and Conclusion

5.1 Discussions on the Main Findings

The study involved the participation of 384 Perak consumers, although only 286 survey questionnaires were successfully gathered and analyzed. All data collected was analyzed using the Statistical Package for Social Sciences (SPSS) version 27. First of all, descriptive analysis was used to evaluate the demographics of respondents, level of independent variables, and level of dependent variable in Perak. Furthermore, Spearman's correlation test was used to evaluate the objectives of the relationship between live streaming (streamers' credibility, media richness, and interactivity) and consumers' purchase intention in Perak.

5.1.1 Demographics of Respondents

All respondents of the 286 questionnaires collected were from Perak. In the study completed by the researchers, the respondents' information can be summarized in terms of gender, age, race, online shopping experience (years), frequency of watching live-streaming shopping (times/week), and monthly disposable income. Overall, the respondents were mainly between 18 and 24 years old, with more females than males. In addition, Chinese respondents had the highest percentage of respondents in this study. Most Perak consumers have 2-3 years of online shopping experience and watch live shopping 1-2 times per week. Most respondents had a disposable income of below RM 2000 per month.

5.1.2 First Objective: To Determine the Level of Live Streaming in Perak.

Descriptive analysis was used in this study to describe the mean scores and standard deviations. The independent variable (live streaming) has three dimensions with high levels of measurement.

The result for dimensions of the independent variables showed that interactivity had the highest mean among the other variables at 4.0818 with a standard deviation of 0.64030. In this study, most respondents perceive a high level of interactivity in live streaming experiences. Most respondents value the streamer's willingness to communicate, the availability of valuable advice, quick responses to specific questions, real-time interaction with other customers, and the impact of their comments on purchase decisions. The results based on the responses indicate that the perceived interaction of live streaming is positive and engaging. This finding was supported by Song and Liu (2021), who stated that live streaming was the most interactively effective in e-commerce. In live streaming, viewers can obtain real-time responses to their product inquiries through synchronized interactive channels (Hilvert-Bruce *et al.*, 2018). As a result, this capability meets the needs of a broad range of potential customers.

They were followed by the streamer's credibility, a mean of 4.0699 and a standard deviation of 0.52203. In this study, most respondents agree with the streamer's high credibility. Most respondents acknowledge the streamer's expertise, extensive knowledge, and commitment to providing information, leading to a positive expectation of the streamer's reliability and benevolence. According to Sharkey (2023), credibility can be established through continuity, which is consistently providing the same level of specialized services or products. Consumers tend to choose streaming media with favorable reputations and popularity (Dai & Cui, 2022). Therefore, streaming media can maintain popularity by providing consumers with accurate and reliable information.

However, media richness is at the lowest mean value of 3.9231 and has a standard deviation of 0.63607 compared to other variables. In this study, most respondents perceive a high level of media richness in live streaming. The majority of respondents perceived live streaming as a platform that facilitates effective communication by providing timely feedback, allowing communication partners to customize messages based on personal preferences, conveying a variety of cues, such as emotional tone and attitude, and enabling the use of rich and diverse language. According to Keller (1998), consumers value media richness because it facilitates more relevant, adequate, and accurate information. Hence, the level of live streaming in Perak is high through the streamer's credibility, media richness, and interactivity.

5.1.3 Second Objective: To Determine the Level of Consumers' Purchase Intention in Perak.

The level of consumers' purchase intention was obtained through descriptive analysis. The result for the dependent variable (consumers' purchase intention) showed a mean value of 3.9455 and a standard deviation of 0.73382, reflecting the high measurement levels. Based on the results, respondents expressed a high level of consumer purchase intention, as evidenced by their agreement to purchase the recommended products during the live streaming. Most respondents feel satisfied with live streaming and prefer shopping via live streaming. According to Mathwick and Rigdon (2004), consumers engaged in live shopping seek new information about products or services that meet their needs constantly, leading to excitement and happiness. It is important that streaming media's vivid presentation of the product also increases customer trust and inspires higher purchase intentions (Hajli, 2015). Hence, there are high levels of consumers' purchase intention in Perak.

5.1.4 Third Objective: To Investigate the Relationship between Live Streaming and Consumers' Purchase Intention in Perak.

Correlation analysis was used to investigate the relationship between live streaming and consumers' purchase intention in Perak.

H1 indicated that there is a positive relationship between streamer's credibility and consumers' purchase intention in Perak. The result showed a strong and positive significant relationship between streamer's credibility and consumers' purchase intention (correlation coefficient = 0.630, $p < 0.01$). Previous studies on

streamers' credibility have only demonstrated that their attractiveness (Xu *et al.*, 2020) and trustworthiness (Park & Lin, 2020) positively affect purchase behavior. However, some studies included 'expertise' as a criterion for a streamer's credibility. Celebrity endorsements are effective for both attracting more consumers to make purchases and attracting potential consumers' attention. Moreover, the streamer's credibility mediated the relationship between perceived risk and purchase intention (Song & Liu, 2021). However, research has shown that streaming credibility (attractiveness, trustworthiness, and expertise) does not significantly affect consumers' purchase intention. The results of past studies are inconsistent with the current study (AlFarraj *et al.*, 2021). The results suggest that streaming credibility should be made explicit to promote purchase intention.

H2 indicated that there is a positive relationship between media richness and consumers' purchase intention in Perak. The result showed a moderate and positive significant relationship between media richness and consumers' purchase intention (correlation coefficient = 0.603, $p < 0.01$). Previous studies have found that consumers' intention to purchase online is positively impacted by perceived media richness, such that consumers decide to purchase a product if the social media platform provides the information they want. Asyraf Hasim *et al.* (2020) found that social media richness positively correlates with purchase intention. It means that consumers intend to buy if social media platforms offer decent media richness. However, Song and Liu (2021) found that media richness has no significant effect on the perceived risk and purchase intention. To increase the media richness, streamers can incorporate promotional activities during live streaming, such as exclusive offers, limited-time discounts, or special promotions. Indeed, promoting content is an exciting way to engage viewers and motivate consumers to engage and participate.

H3 indicated that there is a positive relationship between interactivity and consumers' purchase intention in Perak. The result showed a strong and positive significant relationship between interactivity and consumers' purchase intention (correlation coefficient = 0.721, $p < 0.01$). According to Suntornpithug and Khamalah (2010), online interactivity positively affects purchase intentions. Online interactivity can facilitate communication and enhance trust between sellers and buyers. Regarding consumers making online decisions, online interaction is a helpful and complementary method to acquire additional information (Fang, 2012). Liao *et al.* (2019) also found that customer interaction positively affects customer purchase intention. On the other hand, interactivity does not have a positive and significant effect on purchase intention since any change in interactivity would reduce purchase intentions by a significant amount. Therefore, the ability to interact with consumers as much as possible and create interactive environments to increase consumers' social presence promotes making purchase decisions.

5.2 Implications of Theoretical and Practical

The theoretical and practical implications of this research are described below.

5.2.1 Theoretical Implication

Theoretically, this study found that Perak consumers' purchase intentions were influenced significantly by the streamer's credibility, media richness, and interactivity in live streaming. A theoretical framework for planned behavior (TPB) was used to describe the relationship between live streaming (streamer's credibility, media richness, and interactivity) and consumers' purchase intentions. According to the TPB model, TPB assumes that behavioral attitudes, subjective norms, and perceived behavioral control influence behavioral intentions. The traditional TPB model will be extended by analyzing three factors: streamer's credibility, media richness, and interactivity value as TPB variables. This study contributes to the advancement of knowledge in related themes by providing a reference for future research. The findings of this study also provide insights for marketers regarding how they can better leverage live streaming to increase customer engagement.

5.2.2 Practical Implication

Live streaming has become a widely adopted and effective tool for businesses to connect with consumers in real time. Besides contributing to existing knowledge, these results provide valuable guidance for marketers and businesses seeking to improve purchase intention using live streaming. This study emphasizes the importance of live streamer's credibility, media richness, and interactivity in enhancing purchase intentions. Further, the study provides actionable insights for e-commerce companies contemplating a shift into live streaming, suggesting integrating these insights into their marketing efforts. The use of live streamers with a high degree of attractiveness, expertise, and credibility is recommended by practitioners as an effective method of promoting their products that can directly impact and increase purchase intentions. As a result, streamer credibility, media richness, and interactivity are significant influences on consumers' intentions during live streaming.

5.3 Limitations

Despite some valuable results, this study has some limitations. Firstly, time constraints pose a significant challenge for thorough research. With a limited approximately three-month questionnaire collection period, the researcher faced difficulties gathering the required 384 responses. In addition, administering the questionnaires online added a layer of complexity to the collection process. This resulted in the researcher's inability to follow up with the respondents to obtain more accurate information.

Secondly, the study has the limitation of a small sample size. Since 384 questionnaires were distributed in this research, only 286 of the questionnaires have been returned. This small sample size may not accurately reflect the entire district's population. According to the demographic profile, Perak consumers have the highest percentage of Chinese respondents compared to other races. In addition, a large part of the questionnaire was completed by persons aged 18-24. Therefore, the data collected may reflect mainly the views of younger groups and may not be fully representative of all age groups. As a result, people from different demographic groups may have different views on live streaming.

Lastly, the study exclusively used quantitative methods, preventing respondents from expressing opinions beyond predetermined options. The method may have missed nuanced insights that qualitative methods might have revealed. Future research could provide a more comprehensive understanding of the topic if qualitative and quantitative methods are integrated more effectively.

5.4 Directions for Future Research

Based on this study's overall impact, several directions are suggested for future researchers. The first thing needed for future research is a representative and reliable sample size, given the limited sample size of this study. For future studies, improved communication channels such as email personal or face-to-face distribution of questionnaires could be better utilized to reach a broader audience to improve response rates and the overall reliability of the findings. Also, taking more time to collect data would be more efficient.

As Malaysia is a multi-racial country, future research should strive for a more balanced representation of the different population groups to compensate for the demographic imbalance, especially the over-representation of race among Chinese respondents. Also, since the researcher is a university student and may focus on the views of the younger generation, the response rate of the 18-24 years olds was higher than the rest of the population in the data collected. It is crucial to consider the perspectives of different population groups to ensure a comprehensive understanding of the subject matter.

In addition, data collection methods must be reconsidered in future studies. More than simply relying on questionnaires is considered insufficient, and there is a need for alternative data collection methods, preferably semi-structured interviews. Combining qualitative and quantitative data in the research process will enable better quality information to be collected and more reliable conclusions to be drawn from the study.

Finally, the researcher recommends considering combining more independent variables in future studies to determine the relationship between live streaming and consumers' purchase intention. For the study to be successful, a selection of independent variables that are relevant to the topic of the study must be made.

5.5 Conclusions

In conclusion, this study investigated the relationship between live streaming and consumers' purchase intention in Perak, including streamer's credibility, media richness, and interactivity. The objective is to determine the level of live streaming and the level of consumers' purchase intention and investigate the relationship between live streaming and consumers' purchase intention. The study results show a positive and significant relationship between streamer's credibility, media richness, and interactivity with the consumers' purchase intention in Perak. All three objectives of this study were achieved. As a result, this study provides additional insight into the relationship between live streaming and consumers' purchase intentions for future research. In addition to adding to existing knowledge, the findings provide valuable guidance for marketers and businesses seeking to promote purchase intention through live streaming.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** O.Y.Y. and J.N.; **data collection:** O.Y.Y.; **analysis and interpretation of results:** O.Y.Y.; **draft manuscript preparation:** O.Y.Y. and J.N. All authors reviewed the results and approved the final version of the manuscript.

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