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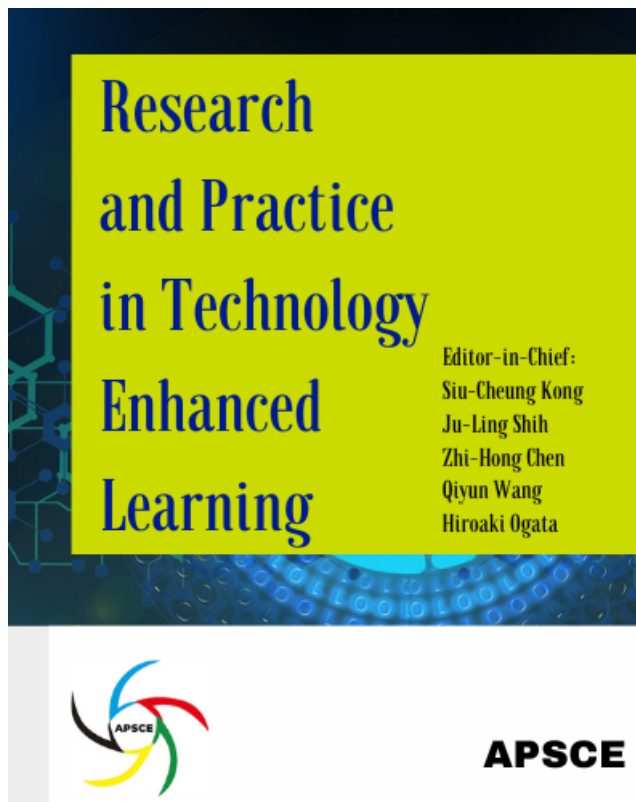
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RESEARCH   **Free and Open Access**

How personal, technical, social environments affecting generation Z to utilise video-based sharing platform in learning process during crisis?

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Abstract

In a crisis such as COVID-19 that struck the world in 2019, social and community activities are restricted, including in-person classes. On the one hand, these restrictions are aimed as a precautionary measure against the virus spread; on the other hand, this could lead to a lost generation without an educational process. Notwithstanding this, online learning through a video-sharing platform is envisaged as the best way to keep learning in this particular situation. However, students have their learning style preferences. While a video-based sharing platform is seen as the most representative way of facilitating self-directed learning, understanding the motivations driving the adoption is crucial. This paper investigates technical, social, and personal environments that motivate generation Z to utilise this tool for self-directed learning, employing Social Cognitive Theory (SCT) as the theoretical lens. A total of 251 survey responses from this cohort were collected and analysed with a structural equation modelling approach. The findings reveal that perceived usefulness and content quality, peer influence, and self-efficacy and outcome from three perspectives, respectively, determine the adoption intention substantially by 67.1%. These findings provide several important implications for video-sharing platform acceptance in terms of both research and practice. Limitations and future research directions are also discussed.

Keywords: Video sharing platform, YouTube, Learning resource, Social Cognitive Theory, Behavioural intention

Introduction

In a recent article, McKinsey, among the most prestigious and prominent international consulting companies, issued an interrogative article entitled "Measuring preparedness:

Are public health systems ready for the next pandemic?" (B-Lajoie et al., 2022). This article is driven by the fact that in a crisis, i.e., when the pandemic status of COVID-19 was announced, many countries, even those with ample resources, were unprepared to cope with the quickly developing public health disaster. Not least in the education sector, as during the pandemic, the learning process has to switch swiftly to online mode as a precautionary measure against the spread of coronavirus. This issue is highly related to the effectiveness of a fully online learning process (Kohler & Dietrich, 2021; Lee et al., 2015; Raikos & Waidyasekara, 2014; Selvi et al., 2020).

This concern, for instance, is also brought to the fore by United Nations Children's Fund (UNICEF) in their investigation report in 2020 (UNICEF, 2020) about averting lost generation during the pandemic. This is because although all the facilitating conditions support both synchronous and asynchronous online learning, e.g., the learning management system, smartphone availability, internet access, and video meeting tools, still the course material cannot be delivered as flexibly as in-person interactions (Kohler & Dietrich, 2021). Let alone the absence of these tools and the motivations, and phycological contact between students and teacher/lecturer, hinder students' learning. Particularly for students in high school and university, i.e., we categorised them as generation Z students as they were born between mid-to-late 1990 and early 2010 (Turner, 2015), this is extremely challenging as they turned to be self-directed learners in this context (Lee et al., 2015). One way to improve the effectiveness of the learning process is by utilising a video-sharing platform. YouTube is chosen as the case study as its popularity and features it offered.

Various scholars have examined how and why YouTube is crucial as a helpful resource for learning for the young generation, particularly during a crisis, e.g., the COVID-19 pandemic (Okpara et al., 2021; Tahat et al., 2022). Notwithstanding these, as pointed out by Kohler and Dietrich (2021), the issue always lies in the fact that not all students, both at high school and/or university, are dominant visual learners; some are kinaesthetic and/or aural learners. However, in preliminary findings, for instance, in here (Kohler & Dietrich, 2021), that although both cohorts have different learning preferences, a video-sharing platform can be perceived as the most representative medium for self-directed learning. Therefore, we aim to contribute to this issue by proposing this research question: what motivates generation Z students to harness YouTube, a video-sharing platform, as a useful resource for learning during a crisis? As we aim to comprehend the motivation of generation Z to harness YouTube as a learning platform, Social Cognitive Theory (SCT) (Bandura, 1986) is envisaged as the most representative theoretical lens to portray this phenomenon.

According to SCT, human motivation and action are heavily governed by contemplation. This kind of control is anticipatory and is based on hypotheses about the results of executing an action. However, compared to the previous studies, our study facilitates a

better understanding of motivation towards the YouTube's intention adoption resulting from the interactions between students, social and technical environments. Individuals are active participants in and products of their environments (Luszczynska & Schwarzer, 2005). We aim to investigate what motivates the intention to adopt YouTube as a video-sharing platform by generation Z at school and university from these perspectives: people, social and technical. As quantitative research, we employ Partial Least Square-Structural Equation Modelling (PLS-SEM) as its predictive capability even if the sample size is small (Astrachan et al., 2014).

This article is structured as follows: The second section includes the theoretical background from the existing literature. The third section describes the hypothesis development, and the fourth section discusses the research methodology. The fifth section presents the analysis data and result; the sixth section discusses the result and its implication. Limitations and future research directions are concluded in the seventh section.

Theoretical background

Role of YouTube in learning process

YouTube is the most popular video-sharing social media in the world and has the most viewers for daily learning and education content (Neumann & Herodotou, 2020; Zhou et al., 2020). It has 2 billion active users and has been used as a learning source with one billion views daily. Most YouTube users are those between 18-29 years old, accounting for 82% (Irawan et al., 2020). They utilise YouTube for entertainment and, in fact, mostly for education. Thus, it is not surprising that YouTube is the most popular resource for learning processes for them, generation Z. YouTube is perceived as the most effective tool as a learning resource due to the values it generates for educational purposes: capacity, practicality, information, interactivity, shareability, and economical. For instance, the platform is very popular because it is interactive, free for everyone to upload, share (shareability) the content of the material (practicality) and be accessed by everyone (economic).

Various scholars have revealed that YouTube can be very effective in learning processes (Chintalapati & Daruri, 2017; Kohler & Dietrich, 2021; Tahat et al., 2022). Particularly, during COVID-19 pandemic that struck the world in late 2019, most of the young generation had no access to appropriate education, including those in universities. This is because in-person meetings and interaction were restricted back then as part of the precautionary measure against the coronavirus spread. Thus, it is urgent for all governments worldwide, including Indonesia, to address this issue effectively to avert loss generation (UNICEF, 2020). One of the ways is by utilising video-sharing platforms, including YouTube. The learning process using video stimulates students' imagination and

enriches their ideas when engaged in imaginative play or creative tasks (Kohler & Dietrich, 2021). Kohler and Dietrich (2021) also noted further that YouTube, as a video-sharing platform, is perceived to be effective as a tool for communicating science material. However, not all students are dominant visual learners. However, they are inclined to be proactive by discussing the content once they follow it. Furthermore, the quality of video screen media is influenced by key content and design features such as questioning, opportunities for students to play, problem-solving, language and literacy learning through text presented on the screen, and stimulation of curiosity.

Social Cognitive Theory

Social Cognitive Theory (SCT) posits that human behaviour is the outcome of interactions between an individual's cognition, environment, and behaviour (Bandura, 1986; Luszczynska & Schwarzer, 2005). A belief in one's ability to affect behaviour change is central to the SCT framework. An individual's sense of agency or control over their actions is related to self-efficacy. Confidence in one's ability to affect their surroundings is reflected in a "can do" mindset (Bandura, 1986). This expression embodies the confidence that comes from knowing one can meet any challenge head-on by taking the appropriate action. How individuals feel, think, and behave is affected by their level of self-efficacy (Compeau & Higgins, 1995). A second important idea in social cognition theory is the concept of outcome expectancies or expectations about the results of certain behaviour. One's actions may result in physiological responses, social reactions, or internalised emotions. They have an effect on goal setting and goal pursuit in tandem with self-efficacy.

SCT has been widely recognised and applied in IS literature to predict technology adoption (El-Sayad et al., 2021; Neumann & Herodotou, 2020; Okpara et al., 2021; Orús et al., 2016; Zhou et al., 2020). In the context of the research, as we aim to examine the intention of generation Z to adopt YouTube as a learning resource in a peculiar situation, we see that personal innovativeness and self-efficacy and outcome expectation alike represent the personal perspective the behaviour change. Personal innovativeness has always been attributed to adopting a new product or technology (Manning et al., 1995). As for the social perspective, influences from peers and external are likely to be the determinant of YouTube's intention. As earlier mentioned, instead of portraying the behavioural change from a personal and social perspective only, in this research, we delineate perceived usefulness, perceived ease of use and perceived content quality as the technical perspective contributing to the behavioural intention.

Adoption intention

Adoption intention to a particular Information Technology (IT) has been a concern for various scholars for decades (Davis, 1989; Venkatesh et al., 2003). It refers to the

motivational factors that affect one to do or not do a particular action; in our context, that is the adoption of YouTube. As previously explained, all the social cognitive factors are the direct determinants that drive behavioural intention. In our context, these factors represent Gen Z's intention to adopt YouTube. The higher a student's intention to adopt YouTube, the more probable (s)he will adopt this particular technology.

Hypothesis development

Our proposed research model is drawn in Figure 1. It comprises three parts affecting the intention to adopt YouTube as learning resources, technical, social and the learners themselves.

Relationship between perceived ease of use and adoption intention

Perceived ease of use is how individuals see the effort level when using the technology. It is one of the key determinants of an individual accepting or rejecting information technology (Davis, 1989). It is defined as the degree to which a person believes using a particular system would be free of effort (Davis, 1989). A system might be simple, but with a complete user experience design, it can increase individuals' perceived ease of use. If the system is perceived as easy to use, it will be more accepted by individuals as it increases the learning curve. In this study, once individuals perceive that YouTube is easy to use, it improves their perceptions to adopt it and even to continue using it (Aldenny et al., 2019). We then hypothesise that:

H1: Perceived ease of use affects adoption intention of YouTube as learning resource.

Fig. 1 Proposed research model
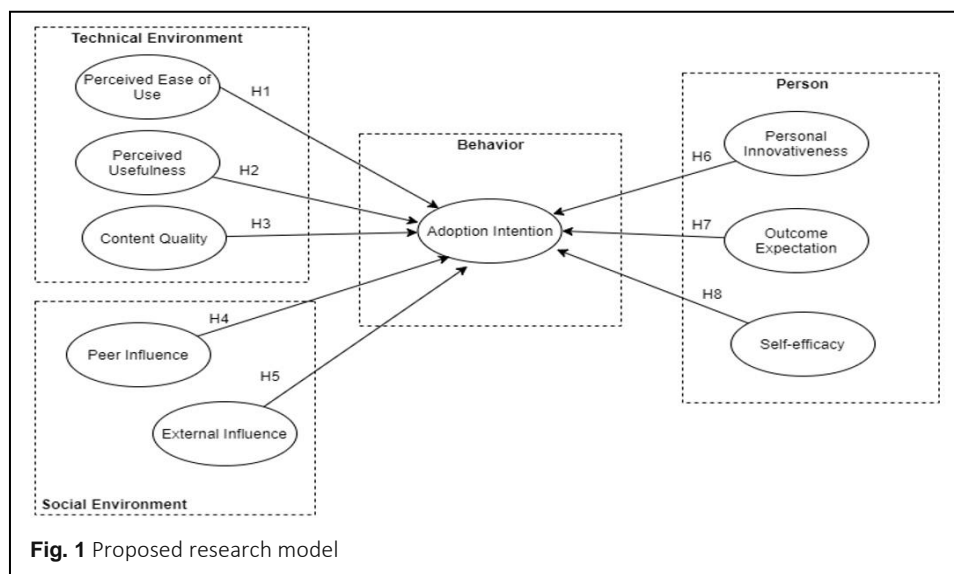
Relationship between perceived usefulness and adoption intention

Another critical factor determining technology acceptance is perceived usefulness (Davis, 1989). It is defined as the degree to which a person believes using a particular system would enhance his or her job performance (Davis, 1989). Employing YouTube will be perceived as beneficial to its users once it helps them learn (Mady & Baadel, 2020). Once YouTube is perceived as helping students in the learning process and improving its effectiveness and productivity (Irawan et al., 2020; Neumann & Herodotou, 2020), it is viewed as beneficial to be used by them. Withstanding these, we then hypothesise that:

H2: Perceived usefulness affects adoption intention of YouTube as learning resource.

Relationship between content quality and adoption intention

As this study aims to investigate YouTube acceptance in the learning process, content quality matters. It is not only about the technical aspect (Moghavvemi et al., 2018; Neumann & Herodotou, 2020) but also about the information quality of it per se. Habes et al. (2020a) agree that content quality is a crucial factor in determining students' satisfaction, as for those who use it, it improves their academic performance. For instance, the richness of the information provided drives it to be used sustainably by its users. At the same time, the quality of the image, the ease of use, and the regular update satisfy the users, leading them to adopt the system, particularly in medical school, which requires clearness and colour of the image for identifying the organ (Aldallal et al., 2019; Johnston et al., 2018; Selvi et al., 2020). Simply put, content quality benefits the students in their learning curve. Thus, this tool is a critical learning resource for students. Based on these, we then hypothesise that:

H3: Content quality affects adoption intention of YouTube as learning resource.

Relationship between peer influence and adoption intention

Peer influence can be defined as the influence arising from individuals' relationships based on affiliation with like-minded friends with similar behavioural proclivities and a tendency to become identical to one's friend over time (Zhu et al., 2020). This factor is posed because of these individuals' social environment, allowing them to interact with peers (Chang et al., 2014). The influence of peer environment leads to the adoption because the peer has already adopted it and therefore influences them (Bandura, 1986). Therefore, we hypothesise that:

H4: Peer influence affects adoption intention of YouTube as learning resource.

Relationship between external influence and adoption intention

Similar to the peer influence in the context of social environment influence obtained by others, external influence in a similar vein, is defined as influence acquired by individuals for their intention to adopt a new technology because of other factors such as social, culture, economics, politics (Chang et al., 2014; Inan et al., 2022). In this context, economic influence is perhaps the most determinant factor that affects the adoption intention. This is because internet access in Indonesia is not evenly distributed. As the video format on YouTube requires more data to access fully, it impacts their intention to utilise it as a learning resource. This particular influence might drive or hinder students from adopting YouTube as a tool for the learning process, particularly during social and community restrictions during the COVID-19 pandemic (Bandura, 1986). Based on these, we hypothesise that:

H5: External influence affects adoption intention of YouTube as learning resource.

Relationship between personal innovativeness and adoption intention

Personal innovativeness is an individual's willingness to try out any new information technology (Lu et al., 2005). These individuals are categorised as those who always seek a new innovative way to deal with uncertainty. However, at the same time they also develop a more positive intention towards accepting new technology. Yilmaz and Bayraktar (2014) posit that the individual's openness to change and adopt a new technology heavily depends on the innovation level of the individual. An individual readily adopts an information technology earlier than others because (s)he expects the benefits of its adoption (Arpaci, 2017; Mahat et al., 2012). During the COVID-19 pandemic, with social and activity restrictions including face-to-face educational process, all the learning activities at all levels are forced to switch to online learning via e-learning, e.g., Moodle, Google classroom and Blackboard. For students, these restrictions also mean that they need to have an alternative way that helps them to keep up with learning materials effectively. This drives them to adopt and adapt a new thing that can help them keep learning: the video-sharing platform YouTube as its benefits. Withstanding these, we hypothesise that:

H6: Personal innovativeness affects adoption intention of YouTube as learning resource.

Relationship between outcome expectation and adoption intention

The term outcome expectation is used to describe the outcomes a person anticipates resulting from his or her actions (Bandura, 1986). A user's outcome expectation towards an application can largely influence the user's intention to adopt it. Most human activity is motivated by thinking about future events and consequences. The viewpoint of the future period presents itself in a variety of ways. Individuals establish objectives for themselves, foresee the potential implications of future activities, and otherwise plan courses of conduct

that are likely to achieve desired results while avoiding undesirable ones. Outcome expectation per se is a consequence likely to happen once an activity is done (Bandura, 1986). In the context of this research, outcome expectation directly affects the adoption of YouTube as a learning resource due to prior experience using it. In addition, Zhou et al (2020) posited that once individuals are expected, YouTube can assist them in obtaining favourable results related to the learning process in school/university, working place, and/or daily life; they tend to adopt it as a learning resource. Therefore, outcome expectations from YouTube usage for learning processes might affect the individuals' intention to harness YouTube to learn. Thus, we hypothesise that:

H7: Outcome expectation affects adoption intention of YouTube as learning resource.

Relationship between self-efficacy and adoption intention

Self-efficacy is defined as people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances (Bandura, 1986). It is not about the talents a person has but rather about their assessments of what they can do with the abilities that they already have. It is part of the most used external factor among the various antecedents describing technology acceptance in education discourse (Abdullah & Ward, 2016). In this research, self-efficacy refers to one's self-assessment of her/his ability to utilise YouTube as a learning resource. Therefore, self-efficacy is used to evaluate the intention to adopt YouTube. Withstanding this, we hypothesise that:

H8: Self-efficacy affects adoption intention of YouTube as learning resource.

Research methodology

Sample and research instrument

The sample of this research is gathered using a questionnaire focused on YouTube users who have experienced employing it as a learning tool. The questionnaire is developed using a Google form to submit it online to the targeted respondents efficiently. The responses from the respondents are measured using a 5-point Likert scale by which 1 (one) to 5 (five) represent completely disagree, disagree, neutral, agree, and completely agree, respectively. We approached the data collection by employing a purposive sampling technique (Etikan et al., 2016). This approach is employed as we need to ensure the respondents meet the criteria previously mentioned. Before submitting the questionnaire, it was piloted by all authors and six other respondents we selected to increase its readability and improve its ambiguities. Once the questionnaire was ready, we submitted it through social media channels such as Telegram, Instagram, Twitter, and WhatsApp. We collected the data from April to July 2021. A valid 251 responses can proceed to the analysis stage as they responded to the questionnaire thoroughly.

In this study, the research instruments are composed of two parts. The first part is about questions related to the socio-demographic characteristic of respondents. The second part is questions related to the instrument items representing the indicators of the factors in the proposed research model. The questionnaire is developed in the Indonesian language as targeted at students in Indonesia. The research instruments are adopted and adapted from the previous related research and have experienced a suite of validation. For instance, the constructs perceived ease of use and perceived usefulness are adapted from Mohammadi (2015), personal innovativeness and self-efficacy are from Pena-Garcia et al. (2020), content quality refers to Inan et al. (2023) and Liao et al. (2006), peer-influence adapted Chang et al. (2014). The detail of the references adopted in this study is drawn in Table 2.

Demography respondent

As earlier described, the respondents are those who have been utilising YouTube as a learning resource for a certain period, accounting for 42.63% male, 54.98% female, and 2.39% who choose not to specify their gender. The majority, 84.86%, of the respondents are university students (Diploma and Bachelor), and the rest, 15.14%, are those in senior and/or vocational schools. As we aim to understand the behavioural intention of utilising YouTube as a learning resource by generation Z (Turner, 2015), in this study, we categorise them into two groups, those who are in school, less than 17-year-old with a percentage of 8.37%, and in university between 17-25 years old with the percentage of 91.63%. The detail of the socio-demographic characteristic of respondents is shown in Table 1.

Analysis data and result

Measurement model evaluation

The measurement model evaluation is the first of two stages in data analysis. It aims to ensure that the measurement items composing the proposed model describing the latent constructs are valid and reliable. As this is a reflective measurement model, Partial Least Square – Structural Equation Modelling (PLS-SEM) is employed. PLS-SEM is used once the hypotheses are explicitly stated (Gallagher & Brown, 2013) and it is reliable for

Table 1 Socio-demographic characteristics of respondents

Profile	Category	Frequency	Percentage
Gender	Male	107	42.63%
	Female	138	54.98%
	Preferred not to say	6	2.39%
Age	< 17 Years old	21	8.37%
	17-25 Years old	230	91.63%
Education	High/vocational school	38	15.14%
	Diploma	15	5.98%
	Bachelor	198	78.88%

processing a small sample size. To process the measurement model evaluation, the first to observe is Factor Loading (FL) values. An FL is generally accepted if the value exceeds 0.7 (Hair et al., 2017). Both Cronbach's Alpha (CA) and Composite Reliability (CR) values are used for this measurement to represent lower and upper bounds, respectively (Peterson & Kim, 2013). Although they both measure the reliability of the measurement indicators, in contrast to Cronbach's alpha, which assumes that each item has the same weight in the composite load, the composite reliability takes into consideration the real factor loadings. Moreover, the values of CA and CR are higher than 0.7, which is considered significant reliability (Hair et al., 2017). The following criterion to be measured is convergent validity, which is assessed by the Average Variance Extracted (AVE). The acceptable threshold for AVE is 0.5 or higher (Astrachan et al., 2014). The confirmatory factor analysis of variables is shown in Table 2.

In order to test the discriminant validity, this research compared the average variance derived from the individual components with the shared variance that existed between the factors (Fornell & Larcker, 1981). This study revealed that the average variances derived from the separate factors were a greater source of variation than the common variances between the factors, indicating that the discriminant validity of the factors was maintained. In Table 3, the reliability, convergent validity, and discriminant validity of the measurement model were all found to be satisfactory.

Structural model evaluation

Once the construct measures are valid and reliable, the next step addresses the structural model evaluation. However, before proceeding with this evaluation, assessing the potential collinearity of the structural model is required. This issue is measured using the Variance Inflation Factor (VIF). A related-constructs value with the VIF is equal or higher than (>=) 5 and/or equal or lower than (<=) 0.2, indicating that they have a collinearity issue. In this research, the VIF values of the related constructs show in a permittable range. Therefore, it can proceed to the structural model evaluation as in Table 4.

The table essentially draws the proposed hypotheses and whether or not they meet all the criteria statistically. In this research, the structural model evaluation is performed using the two-tailed test with a significance level p-value that equals or less than 5% for the hypotheses to be accepted (Hair et al., 2017). Out of 8 (eight) developed hypotheses, five are accepted; they are: H2-H4, H7-H8, and three are rejected as their significant levels are higher than the threshold (p > 0.05); they are: H1, H5, and H6. The model of the evaluated hypotheses is finally presented in Figure 2. This finding also informs the coefficient of determination (R-square) of the adoption intention of YouTube, which can be substantially explained by 67.1% of all the variance of the independent variables.

Table 2 Confirmatory factor analysis of variables

Construct	Measurement Items	Code	FL
Perceived Ease of Use (PEOU)	I am familiar with features in YouTube.	EOU1	0.840
(Mohammadi, 2015)	I do not feel difficult to use the YouTube's features.	EOU2	0.833
CA, CR, AVE = 0.801, 0.882, 0.714	I can use features provided in YouTube easily.	EOU3	0.861
Perceived Usefulness (PU)	Watching a learning video in YouTube improves my skill of the subject.	PU1	0.858
(Mohammadi, 2015)	Watching a learning video in YouTube help me to understand the subject easily.	PU2	0.873
CA, CR, AVE = 0.868, 0.910, 0.717	Watching a learning video in YouTube improves my effectivity in learning process of the subject.	PU3	0.843
	Watching a learning video in YouTube improves my productivity when learning the subject.	PU4	0.811
Content Quality (CQ)	Learning material in YouTube is well prepared	CQ1	0.755
(Mohammadi, 2015; Liao et al., 2006)	Learning material in YouTube is delivered in interesting way.	CQ2	0.823
CA, CR, AVE = 0.845, 0.890, 0.618	Learning material in YouTube has a high-quality video.	CQ3	0.848
	Learning material in YouTube has a high-quality audio.	CQ4	0.779
	Learning material in YouTube is delivered with proportional duration.	CQ5	0.719
Peer Influence (PI)	I watch YouTube in learning process as it is recommended by my friend.	PI1	0.894
(Chang et al., 2014)	My friend advises me to learn from YouTube.	PI2	0.920
CA, CR, AVE = 0.939, 0.956, 0.845	I watch YouTube in learning process as it is recommended by my friend in our learning group.	PI3	0.934
	My friend in our learning group recommends me to learn from YouTube.	PI4	0.928
External influence (EI)	I read news that learning using YouTube is well recommended.	EI1	0.860
(Chang et al., 2014)	Mass medias describe a positive sentiment of learning from YouTube.	EI2	0.849
CA, CR, AVE = 0.837, 0.901, 0.753	Mass medias affect me to try watching learning video from YouTube.	EI3	0.894
Personal Innovativeness (PIT)	If there is a new learning technology, I will be the first to use it	PIT1	0.879
(Pena-Garcia et al., 2020)	I am eager to try new learning technologies	PIT2	0.896
CA, CR, AVE = 0.877, 0.923, 0.799	I like to try new learning technologies	PIT3	0.907
Outcome Expectation (OE)	If I use YouTube to learn, my friend perceives me as a competent person in information technology	OE1	0.840
(Chang et al., 2014)	If I use YouTube to learn I feel I can achieve something higher.	OE2	0.859
CA, CR, AVE = 0.879, 0.912, 0.674	If I use YouTube to learn I perceive I will be looked cool in front of my friends	OE3	0.780
	If I use YouTube to learn I will be comfortable in learning process.	OE4	0.824
	If I use YouTube to learn. I fee enjoy in learning process.	OE5	0.800
Self-efficacy (SE)	I am confident I can use YouTube to learn.	SE1	0.814
(Pena-Garcia et al., 2020)	I am confident I can search learning video in YouTube.	SE2	0.804
CA, CR, AVE = 0.798, 0.880, 0.710	I feel enjoy searching learning video in YouTube	SE3	0.906
Adoption Intention (AI)	I plan to pursue learning process using YouTube.	AI1	0.884
Krishna (Lee, 2006)	I intend to use YouTube as a learning media.	AI2	0.925
CA, CR, AVE = 0.888, 0.931, 0.817	I intent to use YouTube as a learning media in the future.	AI3	0.903

Table 3 Discriminant validity

	AI	CQ	EI	EOU	OE	PI	PIT	PU	SE
AI	0.904								
CQ	0.603	0.786							
EI	0.378	0.378	0.868						
EOU	0.189	0.163	0.032	0.845					
OE	0.674	0.553	0.581	0.098	0.821				
PI	0.341	0.343	0.414	0.038	0.363	0.919			
PIT	0.315	0.327	0.458	0.088	0.464	0.253	0.894		
PU	0.571	0.543	0.239	0.249	0.487	0.191	0.235	0.847	
SE	0.725	0.567	0.273	0.222	0.567	0.158	0.318	0.514	0.843

Table 4 Structural model evaluation

Hypotheses	T-Statistics	P-value	Remark
H1: Perceived Ease of Use → Adoption Intention	0.370	0.706	Rejected
H2: Perceived Usefulness → Adoption Intention	2.804	0.005	Accepted**
H3: Content Quality → Adoption Intention	1.976	0.048	Accepted **
H4: Peer Influence → Adoption Intention	2.871	0.004	Accepted **
H5: External Influence → Adoption Intention	0.098	0.922	Rejected
H6: Personal Innovativeness → Adoption Intention	1.121	0.262	Rejected
H7: Outcome Expectation → Adoption Intention	4.617	0.000	Accepted *
H8: Self-Efficacy → Adoption Intention	8.651	0.000	Accepted *

*p-value < 0.01; **p-value < 0.05

Fig. 2 Path coefficients for all variables
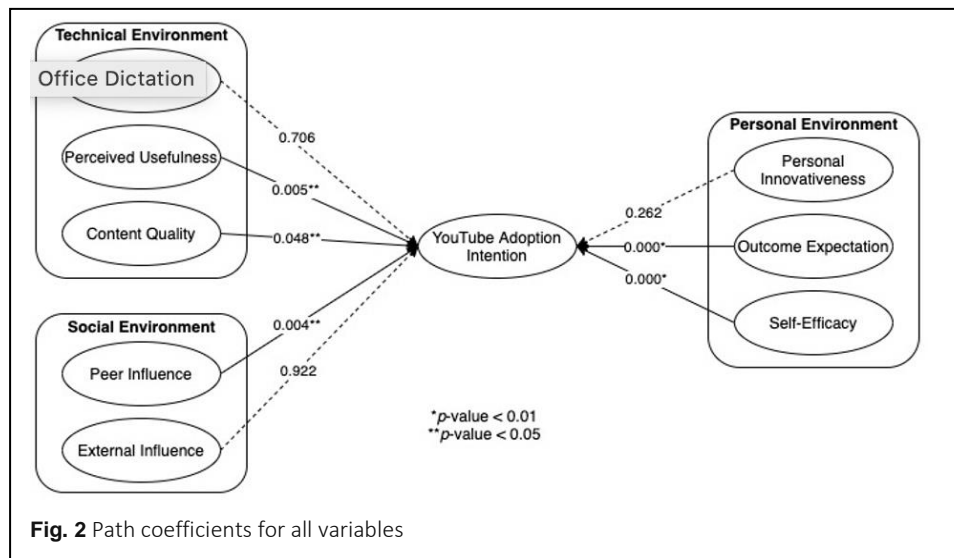
Discussions and implications

Discussions

This research aims to examine factors affecting the motive of generation Z students at high schools and universities to adopt YouTube in the learning process during the time of crisis, i.e., during the COVID-19 pandemic that stroke us since 2019. Thus, first, the targeted

respondents in this study are those from both cohorts; second, they have been utilising YouTube in learning processes during the social and community restrictions. As we intend to capture the motivations as driving factors for the behavioural change of students towards YouTube acceptance, Social Cognitive Theory (SCT) is employed as the most representative tool for this purpose (Compeau et al., 1999; Zhou et al., 2020).

The results demonstrate that of the three environments encapsulating the social-cognitive perspective, one factor from each perspective showed insignificant results statistically to the adoption intention. In the technical environment, it shows that perceived ease of use (H1) does not support our hypothesis. External influence does not significantly affect the adoption intention (H5) from the social environment. From the personal environment, self-efficacy is insignificant statistically to the intention to adopt YouTube as a learning resource (H6). It is noteworthy from the coefficient of determination (R-square) result that the 67.1% variance of this research model can substantially determine the intention to adopt YouTube in this study.

Regarding the technical environment, our results show that the perceived usefulness (H2) and content quality (H3) hypotheses are accepted. These findings support previous ones; for instance, here Aldenny et al. (2019) and Tahat et al. (2022). Notably, as described here Kohler and Dietrich (2021), the learning process using YouTube videos is considered the most representative way to communicate science materials to wider and more diverse audiences. YouTube as a medium for learning was critical during the crisis, as students are demanded to be self-directed learning (Habes et al., 2020b; Irawan et al., 2020). This is crucial as a precautionary measure to mitigate lost generation in a crisis, as amplified by UNICEF in their investigation report in 2022 (UNICEF, 2020). In addition, regarding the content quality significantly affecting the adoption intention (Kohler & Dietrich, 2021; Mady & Baadel, 2020), learning material drawn in texts and images is perceived as not interesting enough to attract students to engage in the learning processes if they are not conveyed in oral and are not well prepared. For the learning material that contains complex and intense concepts to explain, not only is it hard to deliver with text and image only, but also it is difficult to understand if it is not in the best video quality, particularly to those in the specific area such as medical education (Johnston et al., 2018; Selvi et al., 2020).

On the other hand, from the technical perspective, perceived ease of use in our research has no significant effect on the YouTube adoption intention (H1). Although it implies that the finding is contrary to most previous studies, for instance, here Mady and Baadel (2020) and Tahat et al. (2022), however, this result does not sound too surprising given some prior specific findings utilising YouTube in particular contexts as learning resources, for instance, those in the medical study (Aldallal et al., 2019; Raikos & Waidyasekara, 2014). In Raikos and Waidyasekara (2014), for instance, this insignificant perceived ease of use on YouTube acceptance is highly related to the fact that YouTube facilitates anyone to

easily upload their video without being reviewed. The more views and subscribers of the video, the more income a person uploads it can make. Students have to be their own in determining how best to allocate available means to accomplish a specific educational objective (Lee et al., 2015). By the time they search for a specific topic for learning, all the related content produced by anyone will show up, and it is challenging to distinguish which one can be trusted. Selvi et al. (2020) noted this as an issue for those who are not net-savvy users/laymen. In other words, employing YouTube in learning processes can be misleading since the content is not reviewed for quality. For those in medical studies, this can be very challenging and risky as it is not only about wasting time for the poor quality of the video, but also it can be deceptive (Aldallal et al., 2019).

Our findings on the social environment indicate that while peer influence significantly affects the intention of YouTube adoption (H4), external influence does not (H5). These results essentially portray the common sense that a YouTube video utilised in learning processes based on a friend's recommendation who is dealing with the same issues/subjects is perceived as more confident than others. In addition, peer influence affects the intention to adopt YouTube as a learning medium as students have different styles of effective learning. Some are dominant visual learners, and some are kinaesthetic and/or aural learner's type. Regardless of these learning preferences, they all benefit from YouTube as learning media since it meets their criteria. For instance, Kohler and Dietrich (2021) formulate this issue in their study that YouTube can only draw an advantage as learning material once it is discussed. This implies that to be able to be effectively discussed, students have to do it with their peers or friends facing similar issues. This is simply because, as earlier described, the content quality of YouTube cannot be guaranteed as anyone can pretend to be an expert and upload their video. Moreover, learning success is different for each student. Thus, although YouTube is powerful for knowledge sharing and transfer, it needs to be discussed among peers.

The last, from the personal environment perspective to the intention to adopt YouTube in learning processes, while outcome expectation and self-efficacy have significant effects on the intention to adopt YouTube (H7 and H8), personal innovativeness has not (H6). As earlier described, in the context of the research, outcome expectation and self-efficacy are about one's expectation of the intention to adopt YouTube resulting from the experience of using it for a while and a self-confidence that (s)he can utilise it, respectively. These results support previous studies (Al-Maroof et al., 2021; Arpaci, 2017; Okpara et al., 2021). Zhou et al. (2020) posited that once individuals are expected that YouTube will benefit them in the learning process, e.g., resources are beneficial, they understand the subject better, etc., they will adopt it as a learning resource. These results fundamentally are the essence of social cognitive theory per se; beliefs that one's capability to control his/her

activity (self-efficacy) and that the consequence is expected from the activity (outcome expectancy).

However, as earlier mentioned, in our study, personal innovativeness does not support the proposed hypothesis (H6). Personal innovativeness, in this context, is about students' eagerness to try YouTube in the learning process. This finding implies that students did not see that YouTube is a new tool for them. YouTube for generation Z is no longer a new technology for them to be the first to try. It is a ubiquitous technology that they have been very common with since their earliest days. It has been a popular video-sharing platform since its inception, and they are prevalent with it as a digital native. This view is similar to the intention to adopt other technologies. Generation Z students, as digital natives, see that the technology is no longer a new thing for them. A case in point is e-marketplace. As reviewed here Pena-Garcia et al. (2020), personal innovativeness showed no significant result on the intention to adopt those known e-marketplaces. This is because there are various e-marketplaces; therefore, they are no longer a new technology for most people.

Implications

In this study, we particularly shed more light on what motivates generation Z students to accept YouTube in self-directed learning during a crisis (Aldallal et al., 2019; Lee et al., 2015). We employ technical, social, and environmental perspectives from social cognitive theory (SCT) to frame this study. While SCT has been utilised in previous studies to understand and investigate the intention to accept YouTube as a learning resource (Shoufan, 2019), our research is different in that we clearly delineate the technical, social, and environmental perspectives from SCT to portray the behavioural intention.

Theoretically, our model demonstrated that perceived usefulness, content quality of the technical environment, peer influence of social environment and outcome expectation, and self-efficacy of personal environment significantly influence the YouTube adoption intention in the learning process by generation Z. We re-emphasize that, like other emerging technologies, e.g., e-marketplace, m-payment, e-wallet, YouTube has been a ubiquity platform for generation Z. This is because they have been using it since their earliest days as the digital native. Thus, it is not a surprise that personal innovativeness is not significant on the adoption intention, as students perceived that YouTube is not new for them. In the context of the study, as YouTube is used as a learning platform, our findings showed that the influence from external is insignificant but the peer one. This essentially explain the fact that although YouTube is considered to be the most popular and widely used, however, to be effective in the learning process, it is critical to discuss the content among peers, particularly the complex and intense content. Let alone the unmoderated content quality that leads its perceived ease of use is not significant.

Practically, our research showed that for the stakeholders, e.g., teachers, schools, and universities, to increase the intention of generation Z to adopt the YouTube learning process, the content generated needs to be guaranteed its quality and usefulness. In other words, to improve its adoption, although individuals create the context, it is better for the institution's channel to upload it to guarantee its quality. Finally, it is only the quality of the content, such as how it is delivered, the subject it is covered, and the holistic and comprehensive it is, is expected by the students, they are most likely to adopt it. Once they are perceived that the content is interesting and their expectation is higher, their intention to adopt the platform grows.

Limitations and future research directions

Despite using rigorous research methods, this study has certain limitations that might be addressed in further investigations. First, the research that formed the basis for the conclusions and consequences described in this article was limited to students at high school and university from Jabodetabek. A purposive sample of willing responders (i.e., sampling technique with possible bias) may not be generalisable. Researchers in future research should randomise their sample and obtain more to include those from other regions across Indonesia.

Second, the model evaluates perceptions and intentions at a specific moment, making it cross-sectional. However, as people become more experienced, their views evolve (Rogers, 1983; Venkatesh et al., 2003). This should be a concern for the researchers that are interested in examining YouTube adoption. Further investigation is required to assess the reliability of the researched model and our conclusions. A longitudinal study would improve our knowledge of the causation and interrelationships between factors crucial to people's adoption of the YouTube platform as a learning tool, in addition to assisting in predicting beliefs and behaviour over time. Third, there are also other popular video-sharing platforms such as Vimeo and Break. To be able to generalise that they also have the same positive effect that can facilitate generation Z students in self-directed learning required further investigations. Fourth, in terms of searching for the best learning style, another approach, for instance VARK (Visual, Aural, Read or Write, and Kinaesthetic) is also worth pursuing (Fleming, 2006). This is because the approach offers an affective mechanism to classify students based on their learning styles (Leite et al., 2009).

Last, as students intend to accept the YouTube platform in the learning process, their sustainability use is another thing that needs to be examined. Notably, as echoed in this research, previous studies revealed that YouTube is considered the most representative tool to continue the learning process in a crisis whereby social and community restrictions apply. Thus, it will be interesting to explore whether this behaviour will drive them to continue using it, even post-crisis. This will be the flagship of our future research directions.

Authors' contributions
Dr. Inan was the first author who wrote major part of the paper. Ratna Juita as the third author rechecked and refined the paper. Professor Hidayanto as the second author rechecked and improved the paper based on the initial discussion and the methodology employed. Christopher Y Hasian, Kevin Luvian, Leonardo, Samuel Ludwig Ian and Setyawan Pratama were responsible for developing the questionnaire, data collection and analysis. All authors discussed, agreed, and rechecked the paper at the first place before submitting it.

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Declarations

Competing interests
The authors declare that they have no competing interests.

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