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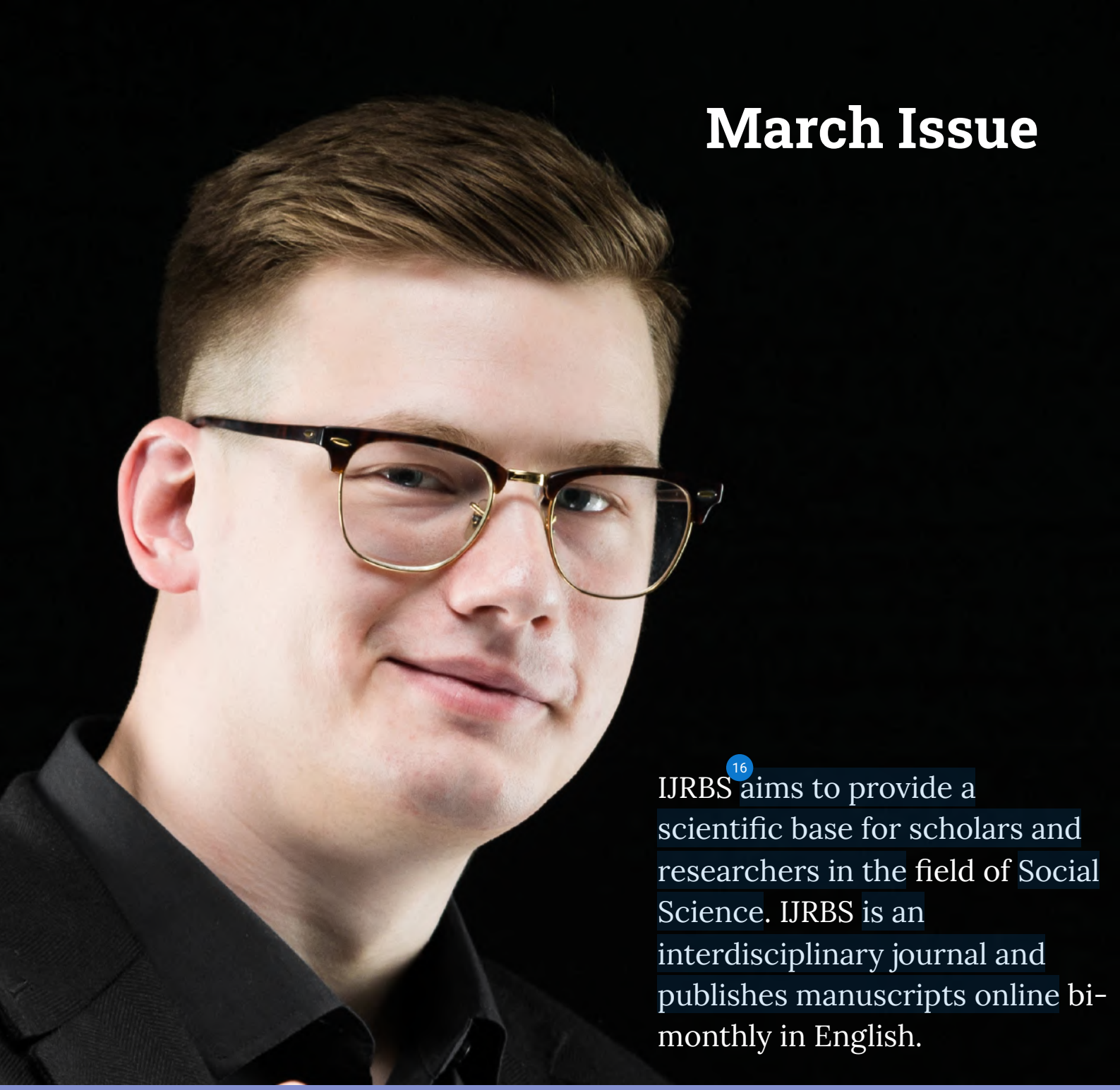

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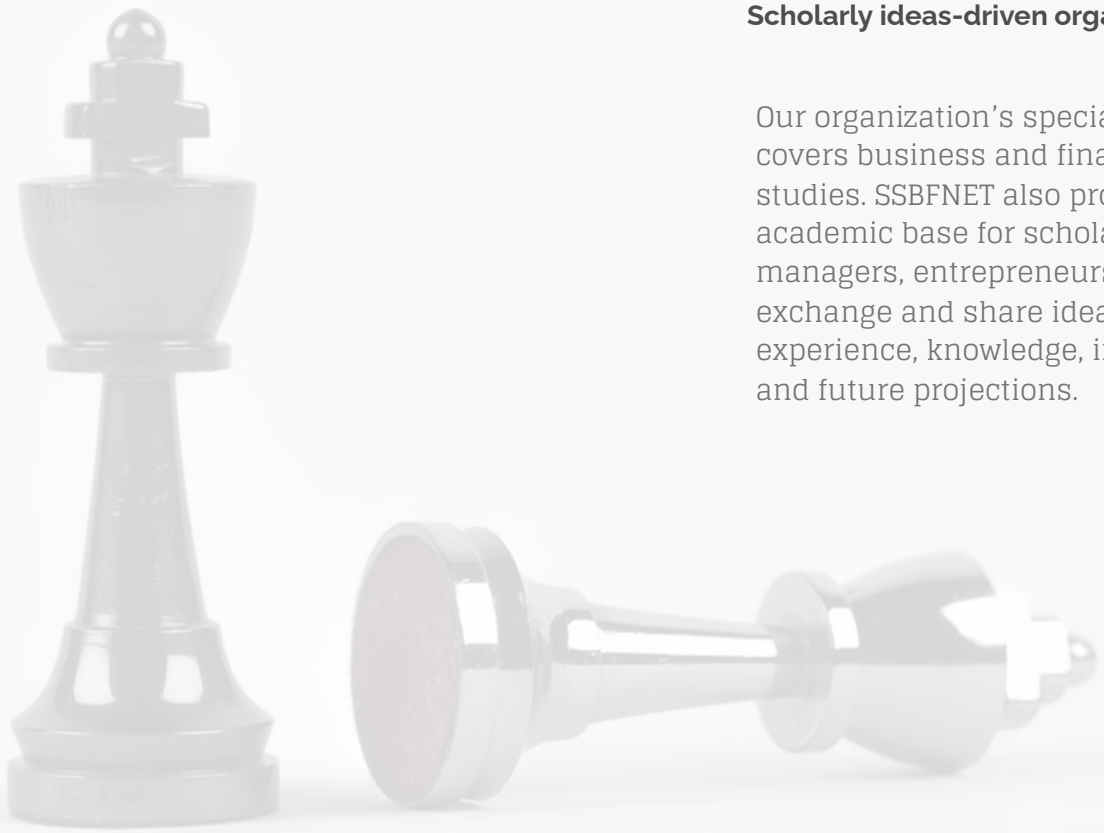

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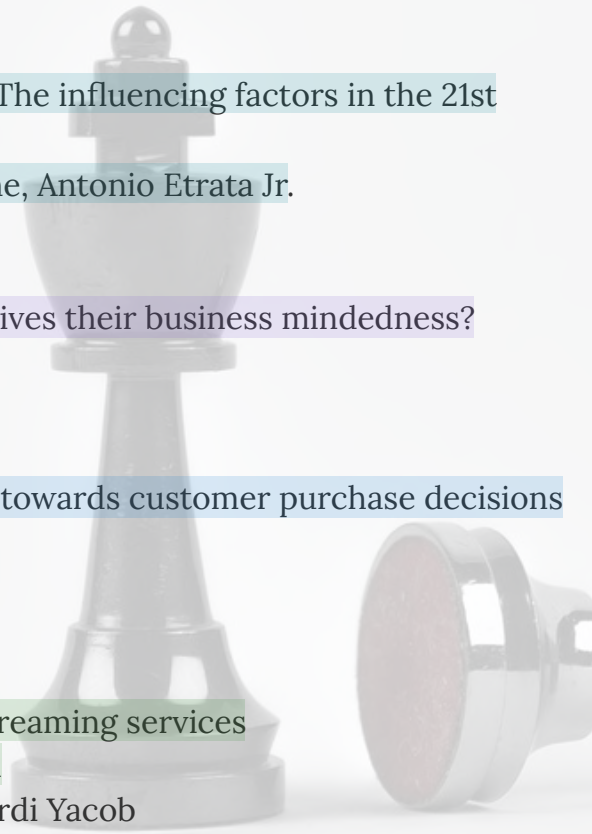

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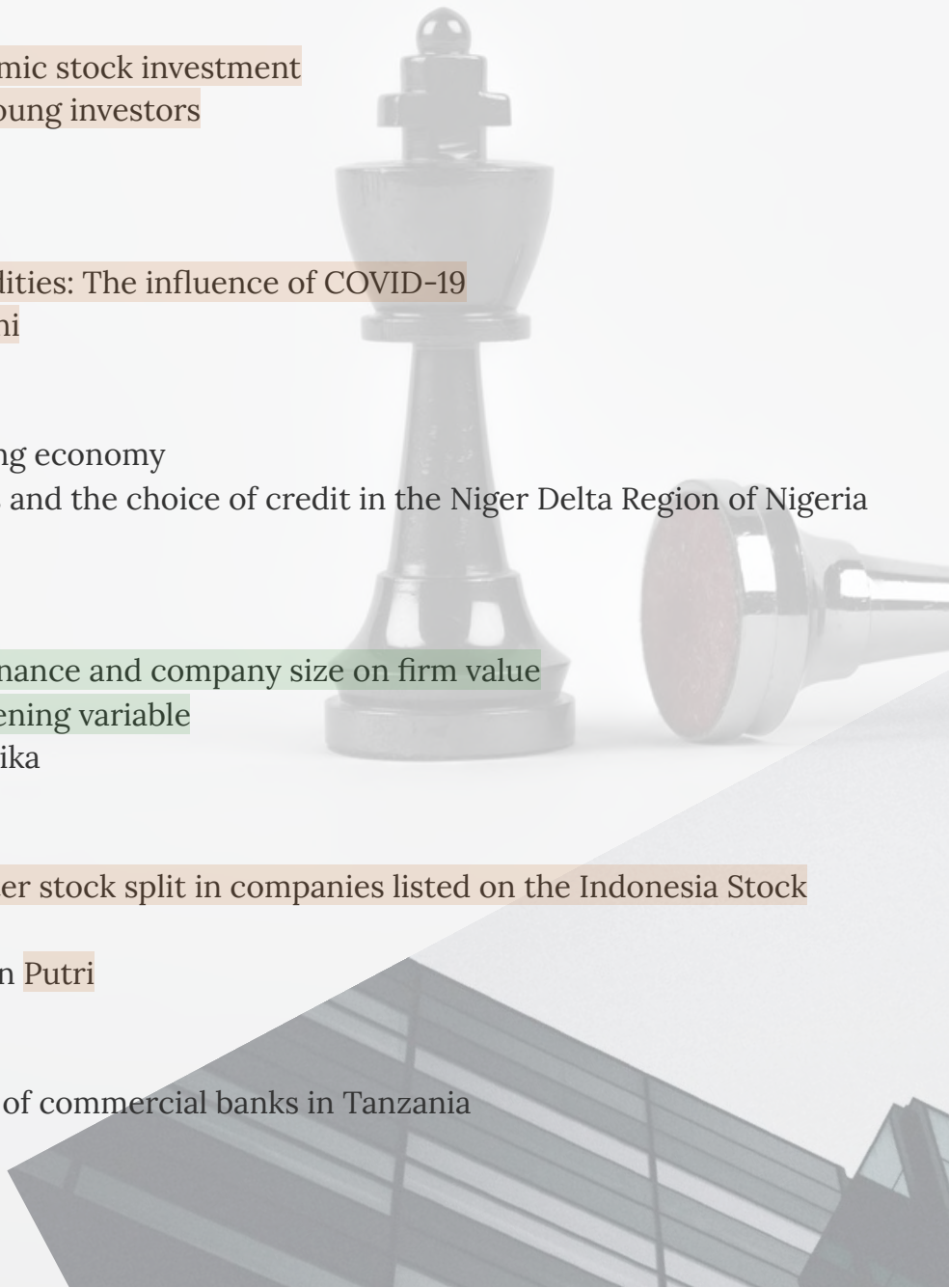

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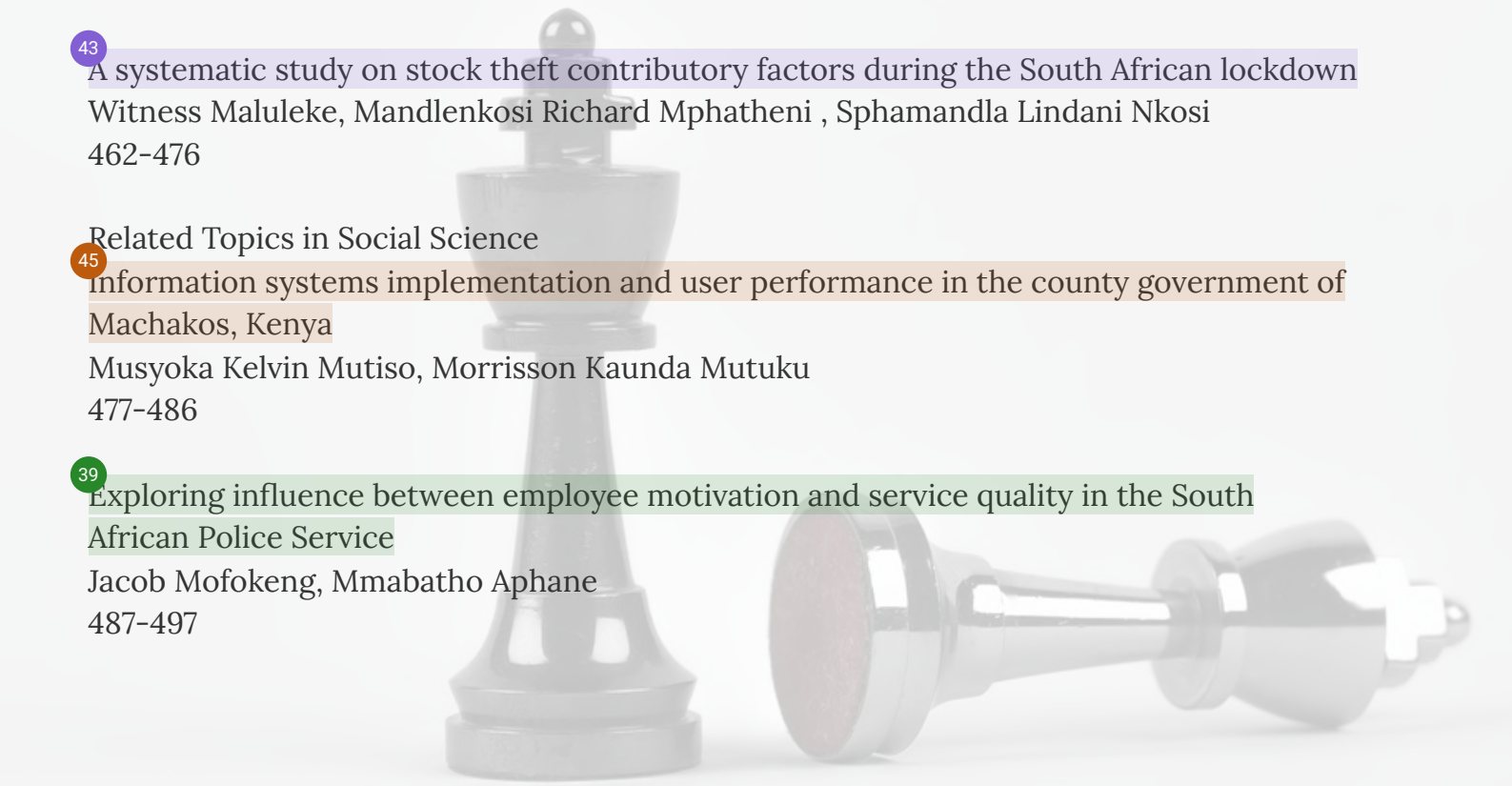

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The influence of interaction, learner characteristics, perceived usefulness, and perceived satisfaction on continuance intention in e-learning system

Andrianto Widjaja [(a)]* *Yosua Giovanni Widjaja* [(b)]

[(a)] *Professor, Lecturer, Sekolah Tinggi Manajeman PPM, Gedung Bina Manajemen, Jl. Menteng Raya No.9, RT.1/RW.10, Kb. Sirih, Kec. Menteng, Kota Jakarta Pusat, 10340, Indonesia*
[(b)] *Lecturer, Sekolah Tinggi Ilmu Ekonomi Jayakusuma, Jl. Suryo Pranoto 1-9 Petojo Selatan Gambir Jakarta Pusat DKI Jakarta 10160, Indonesia*

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ABSTRACT

Communication and information technology have encouraged the use of e-learning systems in the education world. Even the application of the system has become a must in this COVID-19 pandemic health protocol. Nevertheless, it still needs to be observed, whether the consumers would keep using the e-learning system in the future. This study aims to see the effect of interaction variables and learner characteristic toward perceived usefulness and perceived satisfaction on e-learning system that has been used, with the effect of continuance intention toward the system in the future. To answer the purpose of this study, there is a research model has been developed which includes seven hypotheses. For the research object, the researcher chose non-government-owned colleges in Jakarta with the students as the sample chosen by purposive sampling technique. The result of this research shows those seven hypotheses accepted with the significant level at 1%, as well as 5%. It means each of the interaction variables and learning characteristics significantly direct and indirect influence the perceived satisfaction variable as well as the perceived usefulness variable. Moreover, it is proven that perceived usefulness is a significant determinant toward perceived satisfaction, even both of them significantly direct influence continuance intention at e-learning system that has been used.

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Introduction

The development of information and communication technology has changed the face of the education system, marked by the increased use of electronic learning (e-learning) method. The transformation of this learning system takes place more quickly in line with the emergence of the COVID-19 pandemic. One of the health protocols applied in the education world is to minimize the direct interaction between the parties involved in the teaching and learning process. Thus, the application of the e-learning method is a must, especially for higher education providers, namely universities. Meanwhile, it must be acknowledged that direct interaction in the form of face to face between learners and instructors is one of the determining factors for the success in the learning system. This means that universities need to prepare an e-learning system that can facilitate optimal interaction, in addition to carefully considering the learner characteristics as the system user. This study tries to examine whether the e-learning system developed by a university is quite effective and fulfill the expectations of the users. To see the performance of the e-learning system, perceived usefulness and satisfaction factors are involved, where the impact on continuance intention in the e-learning system used will then be studied.

To produce an effective e-learning system, (Liaw, 2008) in ((Azainil et al., 2019) suggested to consider the following three factors, namely: interaction environment, multimedia formats, and learner characteristics represented through learner's self-efficacy. Many parties agree that the interaction factor is the main factor that influences the effectiveness of an e-learning system. (Tang et al., 2014) suggested that interaction element is one of the research themes often chosen related to the form of the collaborative learning process.

* *Corresponding author. ORCID ID: 0000-0001-7876-7592*
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Several studies have also proven a relationship between interaction and perceived satisfaction (Chen et al., 2020); (Baber, 2020); (Goh et al., 2017); (Azainil et al., 2019); (Amsal et al., 2021), as well as with perceived usefulness (Sher (2009, in (Azainil et al., 2019); (Abdullah et al., 2017);(Amsal et al., 2021); (Alhumaid et al., 2020). In addition to the interaction factor, learner characteristic is widely considered as a determining factor for the success or failure of an e-learning. Several studies have also proven that there is a relationship between learner characteristics and perceived satisfaction and perceived usefulness (Liaw, 2008) in (Azainil et al., 2019); (Son et al., 2018); (Masruroh, et al., 2021); (Alyoussef, 2021); (Ke et al., 2012); (Ong et al., 2019).

Meanwhile, perceived usefulness itself is considered to have an influence on perceived satisfaction (Hadji & Degoulet, 2016); (Bataineh et al., 2015); (Maryanto & Kaihatu, 2021); (Daneji et al., 2019); (Amin et al., 2014) and even can influence directly on continuance intention (Hamid et al., 2016); (Junjie, 2017); (Azainil et al., 2019); (Ashrafi et al., 2020). This study is based on the TAM (Technology Acceptance Model) model that uses two constructs, namely perceived usefulness and perceived ease-of-use as the main determinants for the acceptance or rejection of a new technology. The existence of these two constructs is generally influenced by several external variables, before influencing the attitude toward using the system, and then having an impact on the behavior-intention to determine the actual system use. In addition to TAM, ECT (Expectation Confirmation Theory) model is also involved, namely a concept that assumes that perceived performance will influence confirmation, and subsequently will have an impact on satisfaction and continuance intention towards a particular product (Bhattacherjee, 2001) in (Daneji et al., 2019). In this study, a modification of TAM and ECT models will be used, where several external variables will have an influence on perceived usefulness and perceived satisfaction, which in turn will have an impact on continuance intention to the e-learning system used in the research object. As for external variables, interaction environment and learner characteristics are considered.

The study will be conducted at the College of Economics (STIE) of Jayakusuma Jakarta Indonesia. This institution has two undergraduate study programs, namely accounting and management, and has been running educational operations since 1998. Since the COVID-19 pandemic, the institution has begun to effectively implement a learning system using e-learning. Indeed, many obstacles are faced, one of which is the e-learning system developed that is not yet optimum. Therefore, this study aims at examining the influence of external variables, namely interaction and learner characteristics on the performance of the e-learning system used, represented in perceived satisfaction and perceived usefulness, and then the impact on continuance intention of the e-learning system is observed.

Literature Review

Technology Acceptance Model (TAM) and Expectation Confirmation Theory (ECT)

TAM model is an adaptation of TRA (Theory of Reasoned Actions) model and developed specifically to explain the behavior of the use of technology, which in this case means information technology (Davis, 1989) in (Ong et al., 2019). In this TAM model, two constructs are introduced, namely perceived usefulness and perceived ease-of-use that are considered the main determinants for the acceptance or rejection of a new technology. The performance of these two constructs can be influenced by various external variables. Then these two constructs will influence the attitude toward using the system, and subsequently has an impact on behavior-intention before determining the actual system use. In many studies the TAM model can be modified or integrated with other models or variables as needed (Lu et al., 2003) in (Abdullah et al., 2017). On the other hand, the pros and cons of a technology-based system can be seen from the level of satisfaction felt by users. Furthermore, there are many studies that prove that perceived usefulness is a determinant of user satisfaction, among others, the research of (Hadji & Degoulet, 2016), (Maryanto & Kaihatu, 2021), and (Daneji et al., 2019). Meanwhile, (Bataineh et al., 2015) and (Amin et al., 2014) suggested that in addition to perceived usefulness, perceived ease-of-use also acts as an antecedent for satisfaction. The perceived usefulness itself can be described as a situation where someone believes that using a certain system will improve their performance.

Meanwhile, Expectation Confirmation Theory (ECT) means a theory widely used to explain post-adoption behavior (Bhattacherjee, 2001) in (Daneji et al., 2019). This theory assumes that perceived performance will influence confirmation, and subsequently will have an impact on satisfaction and continuance intention towards a certain product. This means that at a certain level, confirmation will be followed up by subsequent behaviors that can be in the form of feelings of satisfaction or dissatisfaction. The state of satisfaction will trigger continuance intention to buy or reuse a system or product in the future. Bhattacherjee (2001, in (Ong et al., 2019) themselves have found a relationship between satisfaction and continuance intention for a long time. (Cheng, 2014) found that perceived usefulness and satisfaction have a positive influence on continuance in LMS usage of a blended learning. In this study, we used modified TAM and ECT models, where several external variables will have an influence on perceived usefulness and perceived satisfaction, which in turn will have an impact on continuance intention to the e-learning system used in the study object. Meanwhile, as external variables, interaction environment and learner characteristics are considered.

Interaction and Learner Characteristics

Interaction is recognized as the main factor in supporting online learning pedagogy, so as to create an effective teaching and learning process. Some literature shows that increased interaction will also increase students' satisfaction and learning outcomes. Interaction can be defined as “reciprocal events that require at least two objects and two actions to occur when these objects and events mutually influence each other” (Wagner, 1994) in (Razali et al., 2020). Meanwhile, (Miyazoe & Anderson, 2013) suggested that interaction does not only occur between humans but also between humans and a variety of media objects. A similar opinion was also expressed

by (Alamri & Tyler-Wood, 2016) that interaction can take place through the use of both synchronous tools (video conferencing, audio channels, online chat rooms) and asynchronous tools (e-mail, discussion boards).

With the emergence of distance learning system, the interaction factor has become a topic that is increasingly being studied by researchers. (Moore, 1989) in (Razali et al., 2020) tried to distinguish three important forms of interaction in the distance education system: (a) Learner-Content interaction, describing how students can obtain information related to learning materials that can be in the form of text, audio, videos, computer programs, and more; (b) Learner-Instructor interaction, describing interactions that occur between teaching and learning parties that can be in the form of various activities that regulate how information is sent, how to motivate students and provide feedback, how to communicate and ask questions in a learning process; (c) Learner-Learner interaction, describing interaction activities to exchange information and ideas among learners that can be in the form of meetings or group discussions between students. This third interaction is a new dimension that is no less important in the distance education process. Even though the distance is physically distance, internet technology allows more intensive interaction when compared to the learning process that occurs in traditional classrooms. Especially, if the classrooms used so far are large making the situation less conducive in terms of discussing and exchanging ideas. Thus, understanding the three forms of interaction above is very important because it has implications for the design of the learning media to be used. Furthermore, it was found that the weakness of distance education was due to lack of consideration of communication media aspect for the application of the three types of interaction above. Moore's concept of these forms of interaction was later developed by other researchers. (Hillman et al., 1994) in (Hernández-Sellés et al., 2020) introduced a fourth form of interaction, namely Learner-Interface on the grounds that interaction needs to be supported by communication technology as an interface. Even Garrison *at al.* (2003, in (Razali et al., 2020) proposed three other types of interaction, namely: teacher-teacher, teacher-content, and content-content. In short, education experts recognized that interaction activities are one of the important factors that influence the success or failure of the learning process

Meanwhile, we agree on the opinion that before developing a product it is necessary to first study who the target user is. Likewise, before developing educational products in the form of e-learning, it is necessary to study learner characteristics. Many observers agree that the learner characteristics factor is one of the elements that influence distance education. According to (Aktan et al., 2010) learner characteristics contain cognitive and affective attributes, such as: ability, content delivery preference, experience, and motivation. Related to this, (Brusilovsky, 2001) in (P.-S. Hsu, 2012) confirmed that the development of an e-learning system must consider the existence of mechanisms that can adapt to learner characteristics. An understanding of learner characteristics is important to produce an effective e-learning system, thus, it will have an impact on the satisfaction felt by learners. To produce an effective e-learning system, (Liaw, 2008) in (Azainil et al., 2019) proposed the following 3 factors to consider, namely: learner characteristics, instructional structure, and interaction. (P.-S. Hsu, 2012) described learner characteristics through the dimensions of learning style and self-efficacy. Self-efficacy itself is widely believed to be an important characteristic in developing e-learning. This character describes the level of user confidence that a certain job can be successfully completed using a certain system. It can be interpreted that the higher a person's self-efficacy, the more he or she will be able to achieve certain goals. (Bandura, 1986)in (Yalalova & Li, 2017) defines self-efficacy as "the belief of the individual according to the personal abilities to manage the situations which influence upon the individual's life". Meanwhile in the study of Passerini & Granger (2000, in (Ong et al., 2019) it is described that learner characteristics can be represented based on several dimensions including the dimensions of self-efficacy and self-directed behavior. (Huang, 2008) study also includes self-directedness as a representation of learner characteristics. On the other hand, the study of (Ke et al., 2012) described user characteristics through subjective norms, self-efficacy, and personal innovativeness. While the research of (Azainil et al., 2019) represented learner characteristics through the dimensions of self-efficacy and self-directedness.

Empirical Review and Hypothesis Development

Relationship between Interaction and Perceived Satisfaction and Perceived Usefulness

In (Baber, 2022) research related to the use of e-learning, it was found that interaction is one of the main factors that influence the effectiveness of an e-learning system. More specifically, Baber found that weak social-interaction in the e-learning system is one of the obstacles to achieve an effective learning process. (Razali et al., 2020) qualitative study with a document-review approach concluded that interaction plays a role as one of the main factors to achieve student satisfaction and learning performance. In general, the assessment of quality of interaction can be considered through three aspects, namely learner-content interaction, learner-instructor, and learner-learner interaction. The study of (Goh et al., 2017) proved that there is a significant influence between interaction which is an experience in the learning process for students and learning satisfaction, where learner-learner interaction is the most dominant factor. (Eom et al., 2006) (also found a significant influence between satisfaction and learner-instructor interaction. On the other hand, the study of (Kumar et al., 2021) proved that interaction represented by learner-content interaction has no significant influence on perceived satisfaction. The study of (Azainil et al., 2019) also found that learner-learner interactions have a positive influence on e-learning satisfaction.

There are quite a lot of studies that strengthen the opinion that interaction contributes to student satisfaction in a distance learning environment either directly or indirectly. (Baber, 2020) research proved that Interaction is the most dominant variable in influencing Student-Perceived-Learning Outcome (which in turn has an impact on student satisfaction), in addition to the variables of Motivation, Course structure, and Instructor facilitation/knowledge. The research of (Chen et al., 2020) also succeeded in proving one of the hypotheses they developed, namely that interaction quality of an e-learning platform has a positive and significant influence on user

satisfaction. Meanwhile, (Amsal et al., 2021) described the interactive learning environment through communication and exploration of activities aspects, and found that interaction factor has an influence on perceived satisfaction.

In the research model developed in this study, interaction factors are also associated with perceived usefulness. Several studies give different results about whether there is a relationship between these two factors. The study of (Sher, 2009) in (Azainil et al., 2019) found a positive and significant correlation between learner-instructor interactions and e-learning usefulness. (Alhumaid et al., 2020) described an interactive learning system through the dimensions of knowledge sharing, communication and motivation. The results of data processing showed that there is a relationship between the three of them on perceived usefulness. This study used instructors at university level as respondents. Slightly different from the study of (Abdullah et al., 2017) where interaction factor is represented by perceived website interactivity that contains dimensions of two-way communication, responsiveness, and user-control. In his study Abdullah *at al.*, developed a proposition stating that perceived website interactivity influences perceived usefulness in the application of a hotel website. Meanwhile, the research of (Azainil et al., 2019) detailed interaction factors of learner-content, learner-instructor, and learner-learner. The results of their research showed that there is a significant influence between learner-content and learner-instructor interactions on e-learning perceived usefulness, while learner-learner interactions have no influence. On the other hand, the study of (Amsal et al., 2021) that used the SEM method proved that there is no significant influence between interactive factors on perceived usefulness in an online-learning learning system in a university. In this research, interaction variables are represented in the dimensions of learner-content interaction, learner-instructor interaction, and learner-learner interaction. From several previous studies already carried out, a hypothesis can be developed that interaction will influence e-learning perceived satisfaction and perceived usefulness that can be detailed as follows:

H1: Interaction has a significant influence on perceived satisfaction

H2: Interaction has a significant influence on perceived usefulness

Relationship between Learner Characteristics and Perceived Satisfaction and Perceived Usefulness

The results of the research of (Liaw, 2008) in (Azainil et al., 2019) found that self-efficacy has a positive influence on perceived satisfaction and perceived usefulness. On the other hand, it was also found that self-directedness influences the satisfaction and effectiveness of an e-learning system (Huang, 2008) in (Azainil et al., 2019). Actually, self-efficacy and self-directedness are several dimensions of learner-characteristic variables. Related to the world of education, (Son et al., 2018) found that self-efficacy and self-directed behavior are positively correlated with learner satisfaction. This finding is in line with the study of (P.-S. Hsu, 2012) that found that learner characteristics, represented through self-efficacy and learning style, are the main factors in developing adaptive e-learning. The study of (Aktan et al., 2010) entitled 'The effects of Learner Characteristics on Satisfaction in distance education' showed a quite different result. Here, learner-characteristics are represented through online technologies self-efficacy and learning-style. The study was conducted on students taking online courses at a university. The results of data processing showed that there is no influence of online technologies self-efficacy on satisfaction, while learning style showed a negative correlation. In the study of (Azainil et al., 2019) several hypotheses were developed, including stating that learner characteristics represented through self-efficacy and self-directedness have a positive influence on e-learning satisfaction and perceived usefulness. Hypothesis testing showing that self-efficacy hypothesis has a positive influence on e-learning satisfaction and perceived usefulness is acceptable. Meanwhile, self-directedness has no significant influence on both perceived satisfaction and usefulness. The research of (Masruroh et al., 2021) also proved that there is a positive and significant influence between self-efficacy on perceived satisfaction, where as a sample, high school students in Surabaya, Indonesia were taken as samples.

The characteristics of self-efficacy have attracted a lot of interest of researchers. The study of (Siron et al., 2020) reviewed factors that influence the use of e-learning during pandemic in Indonesia. One of the findings is that perceived self-efficacy has no significant influence on perceived usefulness. A similar study was conducted by (Alyoussef, 2021) regarding the use of e-learning during pandemic by college students. The results of the study showed that there is a significant influence between self-efficacy and perceived usefulness. It can be interpreted that the higher the perceived self-efficacy of a person, the higher the learning performance of that person through the application of e-learning (Chu & Chu, 2010). The research of (Ke et al., 2012) also proved that there is a positive relationship between user-characteristics and perceived usefulness. One of the dimensions used to describe user-characteristics is self-efficacy, in addition to subjective-norm and personal innovativeness. Meanwhile, one of the objectives of the study of (Ong et al., 2019) is to examine whether there is a significant influence between learner characteristics on perceived usefulness. Here, the learner characteristic factor is represented through several variables including computer self-efficacy and self-directed learning. The study of (Ong et al., 2019) used respondents at several public and private universities in Malaysia. With the assistanc of SEM a correlation between the variables above was found.

From several previous studies, a hypothesis will be developed that learner characteristics, represented in self-efficacy and self-directed behavior, will influence e-learning perceived satisfaction and perceived usefulness, detailed as follows:

H3: Learner characteristics have a significant influence on perceived satisfaction

H4: Learner characteristics have a significant influence on perceived usefulness

Relationship between Perceived Usefulness and Perceived Satisfaction

According to (Davis, 1989) in (Maryanto & Kaihatu, 2021) perceived usefulness is a condition where someone believes that using a certain technological system will improve their performance. In the TAM model, it is stated that perceived usefulness together with perceived ease-of-use will influence a person's behavior in using a certain system, especially information technology-based systems, and will subsequently have an impact on behavior intention. When a system is used, it will automatically be evaluated for the good or bad, which in turn will influence the perceived satisfaction for its users.

The research of (Bataineh et al., 2015) proved that perceived usefulness is one of the factors that influence satisfaction for Facebook users. This opinion has actually long been expressed in the model of (Bhattacherjee, 2001) in (Daneji et al., 2019), namely that perceived usefulness is a significant determinant of user satisfaction. The study of (Hadji & Degoulet, 2016) also empirically proved that user satisfaction is influenced by perceived usefulness in a clinical information system. Furthermore, the research of (Amin et al., 2014) and (Maryanto & Kaihatu, 2021) succeeded in proving a positive correlation between perceived usefulness and satisfaction in technology-based mobile systems.

In relation to the distance learning system or e-learning system, (Junjie, 2017) in his research proved that there is a significant influence of perceived usefulness on satisfaction in the context of massive open online courses (MOOC). Even the research of (Ashrafi et al., 2020) is directly related to the use of a Learning Management System (LMS). One of the findings can be used as a reference for similar studies, namely the significant influence between perceived usefulness on satisfaction of the use of LMS. Similar results were also obtained by (Amsal et al., 2021) in their research related to the use of e-learning with Moodle-platform in a university.

From several studies above, the following hypotheses are developed:

H5: Perceived usefulness in using an e-learning system has a significant influenc on perceived satisfaction.

Relationship between Perceived Satisfaction and Continuance Intention

Based on the ECT concept, (Bhattacherjee, 2001) in (Daneji et al., 2019) suggested that satisfaction is a critical antecedent to repurchase or re-usage of a product or service. Many studies that reviewed the relationship between satisfaction particularly related to the use of e-learning system, and continuance intention were carried out. Among them is the research of (Muqtadiroh et al., 2019) that tried to identify factors that influence e-learning continuance intention. Here, a research model is developed by referring to the concepts of TAM, ECM, TPB, and FLOW theory. One of the findings is that there is a positive and significant influence of satisfaction variable on e-learning continuance intention. Meanwhile, (Shin et al., 2011) used the concepts of ECT and UTAUT (modified unified theory of acceptance and usage technology) to develop a research model to find out what factors influence a user to continue to have an intention to use a smartphone as a mobile learning tool. One of the data analyses found is that there is a positive relationship between satisfaction and continuance intention.

On the other hand, (Junjie, 2017) study utilized the Expectation Confirmation Model (ECM) in the context of massive-open-online-courses, which is then analyzed through a structural equation model (SEM). Empirical results showed that three variables in ECM (satisfaction with prior learning experience, confirmation, and perceived usefulness) have a significant influence on continuance intention. Almost similar is the study of (Ifinedo, 2018) which aims at reviewing factors that influence student's continuance intention. His research is related to the use of blogs for the learning process at undergraduate-level course. To answer the research objectives, Ifinedo combines several concepts to develop a research model that involves the concepts of TAM, ECM, Social Cognitive Theory (SCT), and Innovation Diffusion Theory. One of the results of his research supports the opinion that satisfaction is the main determinant of continuance intention. The research of (Azainil et al., 2019) also proves that there is a significant influence of e-learning satisfaction on continuance intention.

From several previous studies, the following hypotheses can be developed:

H6: Perceived satisfaction in using an e-learning system has a significant influence on continuance intention.

Relationship between Perceived Usefulness and Continuance Intention

In the model developed in this study, apart from being related to perceived satisfaction, perceived usefulness is also directly related to continuance intention. Several previous studies have proven a relationship between these two variables. The study of (Hamid et al., 2016) examined whether or not there was a relationship between predictor variables (perceived usefulness and perceived ease-of-use) and the criterion variable, namely continuance intention in using e-government applications. The results showed that there is a positive and significant influence of the predictor variable on the criterion. However, this study did not explicitly explain the type of the said application, thus it could not be concluded that this influence applies to all types of e-government applications. The results of research of (Junjie, 2017) also showed that there is a significant influence of perceived usefulness on continuance intention of massive open online courses. In this study the perceived usefulness variable is represented through indicators of knowledge outcome and performance proficiency. In connection with research on the use of an e-learning system, (Ashrafi et al., 2020) tried to examine factors that influence student's continuance intention in using the Learning Management System (LMS). In his study, Ashrafi developed a research model based on a combination of several concepts, namely TAM, ECM, Social Influence, and Perceived

Enjoyment. This research involved respondents from students in Tehran city. The results of the research are quite surprising that it is evident that perceived usefulness variable is proven to be the main determinant of continuance intention.

However, different results were obtained in the research of (Wang et al., 2019) which tried to study the relationship between usability and continuance intention to use cloud e-learning applications factors. This study involved 5 usability factors, namely computer self-efficacy (CSE), enjoyment, perceived ease-of-use, perceived usefulness, and user perception, as independent variables. It is evident that only 2 variables, namely CSE and Enjoyment, have a significant influence on continuance intention to use cloud e-learning applications. Likewise, in the (Bölen, 2020) study which aimed at reviewing what factors can influence continuance intention to use smart watches. From the results of data analysis, it is evident that all of the variables are considered to have a significant influence, except perceived usefulness which is proven to have no direct influence on continuance intention. On the other hand, the research of (Azainil et al., 2019) proved that there is a significant influence of perceived usefulness on the continuance intention of the e-learning system implemented in several universities in Indonesia.

From various previous studies, the following hypotheses were developed:

H7: Perceived usefulness in using the e-learning system has a significant influence on continuance intention.

Research and Methodology

This study aims at studying whether there is an influence between interaction variables and learner characteristics on perceived usefulness and perceived satisfaction in the e-learning system used, and their impact on continuance intention in the system in the future. To answer this question, a research model was developed that gave rise several research hypotheses (H1 to H7).

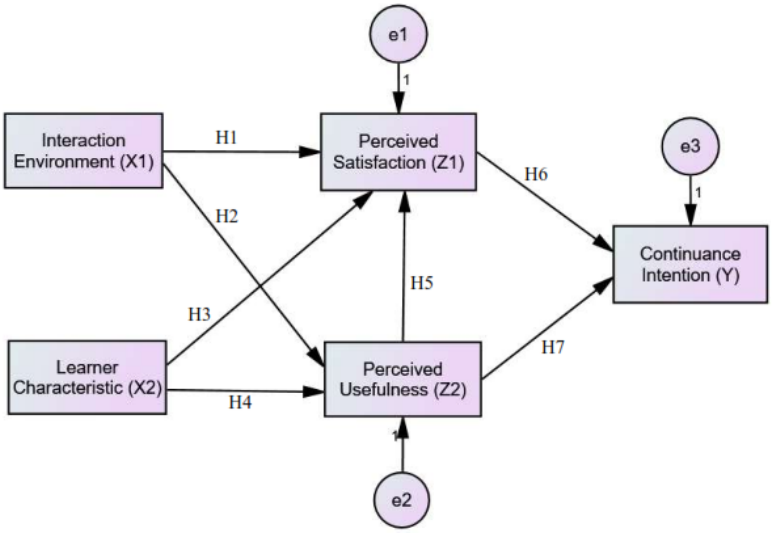

Figure 1: Research Model

The research was conducted only at an educational institution, namely STIE Jayakusuma Jakarta Indonesia. The research sample was taken from undergraduate students from accounting and management study programs. The number of samples was 120 people selected through purposive sampling technique. To get the perception of the respondents, a questionnaire was designed containing a list of questions or statements related to indicators of the research variables. All statements were measured using a Likert scale from numbers 1 to 5 to represent the conditions of strongly-disagree, disagree, moderately-agree, agree, and strongly-agree. As for the perceived usefulness variable, indicators refer to the study of (Davis, 1989) in (Daneji et al., 2019). Meanwhile, for perceived satisfaction and continuance intention variables, adaptation indicators from the studies of (C. L. Hsu & Lin, 2015), (C. K. Hsu et al., 2013) and (Bhattacherjee, 2001) in (Daneji et al., 2019) were used. Furthermore, for interaction variables and learner characteristics, it refers to the questionnaire developed in the study of (Azainil et al., 2019). Here an interaction variable is detailed based on dimensions of learner-content interaction, learner-instructor interaction, and learner-learner interaction, while a learner characteristic variable only considers dimensions of self-efficacy and self-directed. The next stage is to evaluate the quality of research instruments through validity and reliability tests. Meanwhile, to analyze the research model, path analysis will be used.

The Result of Research and Discussion

The number of processed sample data derived from 120 respondents, whose profile was classified into gender, age, and study program. Most of the respondents were male students of 62 percent, while the rest were female students. Based on the age factor, most of the respondents, namely 82 percent were between 21-26 years old, and 16 percent were under 21 years old, while the rest were over 26 years old. Meanwhile, most of the respondents (81 percent) were students of the management undergraduate study

program and the rest were from the accounting study program. At the test stage of the research instrument in the form of validity and reliability tests, it showed that both criteria were acceptable. While the research model was analyzed using path analysis techniques with the assistance of Amos application software. The results of data processing showed that all developed hypotheses are acceptable at 1 percent and 5 percent significance levels (table 1).

The first hypothesis (H1) stating that interaction has a significant influence on perceived satisfaction is acceptable. This result is different from the result of (Kumar et al., 2021), but in general it is similar to the results of previous studies (Razali et al., 2020); (Goh et al., 2017); (Eom et al., 2006); (Chen et al., 2020); (Amsal et al., 2021). Likewise, the results of the data processing confirmed the acceptance of H2. This result is quite different from the study of (Amsal et al., 2021) which found no significant influence between interaction factors on perceived usefulness in online-learning systems. However, the results of this study are supported by the results of the studies of (Azainil et al., 2019), (Alhumaid et al., 2020), and (Abdullah et al., 2017).

This study also found that learner characteristics has a significant influence on perceived satisfaction (H3), which is similar to several previous studies (Liaw, 2008) in (Azainil et al., 2019); (Masruroh, 2021); (Son et al., 2018); (Azainil et al., 2019), although different from the results of the research of (Aktan et al., 2010). Meanwhile, the acceptance of H4 is also supported by the research of (Ke et al., 2012), (Ong et al., 2019), and (Alyoussef, 2021). However, (Siron et al., 2020) found that self-efficacy as one of the representations of learner characteristics has no significant influence on perceived usefulness.

The results of data processing through path analysis techniques also proved the acceptance of H5, H6, and H7. Many researches have also proven a relationship between perceived usefulness and satisfaction (Bataineh et al., 2015); (Hadji & Degoulet, 2016); (Amin et al., 2014); (Maryanto & Kaihatu, 2021); (Ashrafi et al., 2020). Even perceived usefulness can directly influence continuance intention (Hamid et al., 2016); (Junjie, 2017); (Ashrafi et al., 2020). Indeed, there are several researches that prove otherwise such as the research of (Wang et al., 2019) and (Bölen, 2020). Meanwhile, H6 is generally supported by many previous studies, and it can be understood that satisfaction will determine continuance intention to use a product or system (Bhattacherjee (2001, in (Daneji et al., 2019); (Muqtadiroh et al., 2019); (Shin et al., 2011); (Ifinedo, 2018).

Table 1: Regression Weight & Standardized Reg. Weight

Regression Weights:

			Estimate	S.E.	C.R.	P	Label
Var_Z2	<---	Var_X2	,256	,026	9,708	***	
Var_Z2	<---	Var_X1	,121	,018	6,764	***	
Var_Z1	<---	Var_X2	,178	,037	4,786	***	
Var_Z1	<---	Var_X1	,080	,022	3,608	***	
Var_Z1	<---	Var_Z2	,256	,096	2,650	,008	
Var_Y	<---	Var_Z1	,325	,134	2,428	,015	
Var_Y	<---	Var_Z2	,355	,135	2,636	,008	

Standardized Regression Weights:

			Estimate
Var_Z2	<---	Var_X2	,603
Var_Z2	<---	Var_X1	,420
Var_Z1	<---	Var_X2	,416
Var_Z1	<---	Var_X1	,275
Var_Z1	<---	Var_Z2	,254
Var_Y	<---	Var_Z1	,250
Var_Y	<---	Var_Z2	,272

Source: Author

Table 2: Standardized Direct Effects

	Var_X1	**Var_X2**	**Var_Z2**	**Var_Z1**
Var_Z2	,420	,603	,000	,000
Var_Z1	,275	,416	,254	,000
Var_Y	,000	,000	,272	,250

Source: Author

Table 3: Standardized Indirect Effects

	Var_X1	**Var_X2**	**Var_Z2**	**Var_Z1**
Var_Z2	,000	,000	,000	,000
Var_Z1	,107	,153	,000	,000
Var_Y	,210	,306	,064	,000

Source: Author

Table 4: Standardized Total Effects

	Var_X1	**Var_X2**	**Var_Z2**	**Var_Z1**
Var_Z2	,420	,603	,000	,000
Var_Z1	,382	,569	,254	,000
Var_Y	,210	,306	,335	,250

Source: Author

In addition, the path analysis technique also provides information related to the direct or indirect influence between research variables. Table 2 shows direct and indirect influence of the interaction variable (X1) and learner characteristic variable (X2) on perceived satisfaction (Z1) and perceived usefulness (Z2), even on continuance intention (Y). What makes it interesting is that although there is no direct influence, interaction and learner characteristics have an indirect influence on continuance intention in the e-learning system used by the respondents.

Conclusion

This study aims at reviewing whether or not there is an influence between interaction and learner characteristics variables on perceived usefulness and perceived satisfaction in the e-learning system used, and its impact on continuance intention on the system in the future. In order to answer the research objectives, a research model was developed that gave rise to 7 (seven) hypotheses. The results of data processing showed that the seven hypotheses are acceptable at 1 percent or 5 percent significance level. This means that each interaction variable and learner characteristic have a significant influence, either directly or indirectly, on the perceived satisfaction and the perceived usefulness variables. In addition, it is proven that perceived usefulness is a significant determinant of perceived satisfaction, and even has a direct significant influence on continuance intention. The results of the study also confirmed that there is a significant influence of perceived satisfaction on continuance intention in the e-learning system applied to the research object. Of course, the results of the research obtained cannot be separated from the selected research sample, namely the STIE Jayakusuma students, as well as the e-learning system already developed by the institution.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy.

Conflicts of Interest: The authors declare no conflict of interest.

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