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E-Learner's Needs for Sustainable Tourism Higher Education: A Case of Vietnam

E-learning has been suggested to help higher education organizations in tourism to achieve sustainable development. Thus, this study aims to identify factors determining the learners' needs for e-learning programs, particularly in a tourism curriculum. Based on relevant research and the Technology Acceptance Model, the study conducted a survey with 1,109 learners in the Central Coastal region of Vietnam. The results show that the e-learning environment, perceived ease of use, perceived usefulness, playfulness, and information technology skills have a positive impact on the learner's needs. These findings provide useful managerial implications for e-learning of tourism programs which contributes to the sustainable development of higher education as well as tourism industry through its workforce.

Key words: Central Coast region of Vietnam; E-learning programs; Learner's needs;

Sustainable development; Tourism sector

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Introduction

According to the United Nations World Tourism Organization (UNWTO), tourism is not only one of the largest industries globally, but it has also become one of the fastest-growing (UNWTO, 2016). The rapid growth of the tourism industry, along with globalization, rapid technological advancement, and climate change has impacted the need to travel, live, and work sustainably. The exponential growth of tourism also imposes special requirements for sustainable responsible action (Boley, 2011). While the positive impacts of tourism have been widely acknowledged, there is a shift to focus not only on economic profit but also on environmental problems underpinned by the rapid depletion of natural resources (Boley, 2011). The concern for sustainability or sustainable development (SD) has become a focus in the tourism industry to reduce its ecological footprint (Boley, 2011; Chawla, 2015). Accordingly, tourism education has followed the lead of the industry.

The awareness and commitment to SD also need to be transferred and applied in tourism education. Education is identified as one of the key agents to achieve sustainability (Pavlova, 2009; UNESCO, 2005; UNESCO, 2014a). Education for Sustainable Development (ESD) is “*to integrate the values inherent in the sustainable development into all aspects of learning to encourage changes in behavior that allow for a more sustainable and just society for all*” (UNESCO, 2005, p. 5). Sustainability has been embedded in higher education by introducing the concept and practices in its curriculum, course, and campus (Evans, Stevenson, Lasen, Ferreira, & Davis, 2017). Various competences for SD, including a set of knowledge, skills, values, and attitudes needed to deal with SD, have also been integrated into higher education programs which is an essential step in achieving sustainability in higher education (Lambrechts, Mulà, Ceulemans, & Molderez, 2013). In the modern world, higher education has an obligation and pivotal position in redefining education for sustainability, surpassing its two traditional functions of research and teaching (Corcoran and Wals, 2004),

with the focus on the preposition ‘for’. Beyond the conventional learning activities which are predominantly ‘about’ sustainability, higher education institutions should act as role model ‘for’ sustainable practices and use non-formal and informal learning activities to build the competences ‘for’ sustainability mentioned above.

Meanwhile, information technology is considered a powerful tool which has been used to maintain sustainability in both the private and public sectors (Touray and Jung, 2010). Ali and Frew (2013) argued that the relationship between information and communication technology (ICT) and sustainable tourism is symbiotic since ICT tools have contributed significantly to minimizing the negative impacts of tourism. ICT presents a way to improve organizational management and control by facilitating the identification of environmentally sensitive areas and providing information to decision-makers as well as to offer the communities opportunities to protect and promote endogenous resources (Ali and Frew, 2013). Schieder et al. (2014) considered ICT tools to be the best choice for public organizations to promote cultural enrichment and to protect cultural attractions from degradation or negatively affected by tourists. The application of ICT in tourism education is therefore a good approach to contribute to the sustainable development of higher education as well as the tourism industry.

E-learning is a modern training method based on ICT (Servage, 2005) and thus could be a meaningful approach for sustainable development in education (Azeiteiro et al, 2014; Otto and Becker, 2019). In the study, the term e-learning programs are understood as programs that are completely offered online. This means that learners only need to be connected to the Internet and participate in these programs, degrees or certificates can be awarded online. The use of e-learning management system contributes to sustainability by significantly reducing the production of materials and preserving resources (Isaias and Issa, 2013). The virtual mobility provided by e-learning can provide students with a flexible

exchange of learning (Vriens et al., 2010; Otto, 2018) and it helps to reduce environmental impacts and enables sustainable development (Otto, 2018). E-learning also equips students with communication and ICT skills (Isaias and Issa, 2013) which required in their future career and in turn contribute to their sustainable practices in the tourism industry. In addition, there are various ICT-based tools with innovative approaches that can be used in e-learning and help to reduce the negative impact of tourism, such as Computer Simulation, Virtual Tourism, Intelligent Transport System, and Carbon Calculators (Ali and Frew, 2014). This indicates that the application of ICT in tourism education such as e-learning is a good approach to contribute to the sustainable development of higher education as well as the tourism industry.

As a new approach in Vietnamese higher education, its adoption is limited in Vietnamese university (Pham and Ho, 2020). Accordingly, the knowledge of current and potential e-learners and their needs remains unclear (Ngo & Hoang, 2020; Pham & Ho, 2020). Additionally, literature on e-learning in tourism programs with a learner focus remains scarce. This study, therefore, aims to explore the needs of learners before developing e-learning programs, particularly focusing on the tourism discipline. With the new knowledge on potential Vietnamese e-learners, this study contributes to the literature of e-learning and thus facilitate the development of sustainable courses as well as to meet the goals of sustainable education, especially in the context of developing countries. With the focus on tourism programs, its findings could also assist the sustainable development of tourism curriculum and in turn facilitate the sustainable tourism development of Vietnam.

Literature review

E-learning and Education for sustainability in higher education

E-learning refers to the application of ICT in education and training to support the individual learning and performance goals of organizations (Servage, 2005). Various terms

have been used interchangeably within e-learning, including online learning, virtual learning, web-based learning, and networked learning. While these are similar, they are not necessarily the same. Virtual learning indicates a range of systems that offer virtual spaces where participants can be active and present actors (Dillenbourg et al., 2002), whilst networked learning focuses on the internet-based and collaborative connections among users (de Laat et al., 2006). E-learning is understood as the "*distribution of instructional content or learning experiences are provided or enabled by electronic technology*" (Servage, 2005, p. 306). Electronic technology can be applied fully or partially in educational programs. Thus, in this study, the e-learning programs are understood as programs that are completely offered online, using ICT as a communication and delivery tool for their teaching and learning content.

In the context of tourism education, e-learning has become a meaningful and effective approach. E-learning is highly flexible and thus matches specific working conditions of tourism and hospitality employees (Sigala, 2002). It also provides tourism students with the necessary skills and knowledge required by the industry, including critical thinking, problem-solving, and especially technological competence (Cho and Schmelzer, 2000). While several studies attempted to provide an understanding of e-learning in tourism and hospitality, the focus on the e-learning community, i.e. the learners, remains scarce (Cantoni et al., 2009). This study thus aims to fill this gap.

In the process of designing curriculum and learning materials, analyzing learners and their needs is the first essential step to ensure the success of e-learning programs and the satisfaction of learners. It is also necessary to consider a learner-centered approach, which involves collecting information about the learners, including their needs, perceptions, behaviors, and intentions to participate in e-learning programs. Since the 2000s, the Vietnamese government has facilitated the development and application of ICT on a national scale, including the education sector (Dang, 2014). However, it is still in the early stage of

ICT adoption in higher education. In Vietnam, the term ‘distance learning’ is commonly used to describe e-learning (Pham and Ho, 2020). Nonetheless, e-learning is considered an online learning method that uses an internet connection for teaching and learning. Currently, there are nearly 20 higher education institutions in Vietnam offering e-learning programs at many different levels, including completely online, a combination of traditional and online learning, and e-learning for individual modules. However, the application of online teaching and learning at universities is still not their main activity (Ngo and Hoang, 2020).

The approach to sustainability in higher education should not only be integrated into the development of a particular disciplines' curriculum but also the university's daily operation activities. In HE, the evolution of ESD may be seen in many ways: 1) Policy, planning, and administration; 2) education (courses and curricula); 3) research; 4) university operations; 5) outreach and services, and 6) assessment and reporting (Saadatian et al., 2012; Lozano et al., 2013b; Azeiteiro et al., 2015). As a result, through a variety of initiatives, many universities have successfully introduced ESD into their educational activities. E-learning is a strategy for ESD, especially in the context of lifelong learning and adult education, and some studies have been conducted to assess the effects of e-learning in higher education for emitters of sustainable growth (Azeiteiro et al., 2014; Eneroth, 2000; Isaias & Issa, 2013). The widespread use of e-learning in both formal and informal education was indicated to contribute to various aspects of sustainability, including reduce time and cost, saving energy and raw materials, increase competitiveness and innovation, meet the needs of stakeholders and learners (Isaias & Issa, 2013). Because of lifelong learning, adult education, and a significant increase in the use of Information and Communication Technology (ICT), e-learning has become increasingly important in the learning and educational process (Azeiteiro et al, 2014). When it comes to adult learning, e-learning adds new dimensions to formal education and enhances students' desire to learn about environmental issues (acquire

knowledge) (Eneroth, 2000). Wilson et al. (2011) argue that by developing new engaging online ways to discuss and address environmental issues, people would be more motivated to investigate sustainability issues. According to Paechter et al. (2010), academic achievement is also strongly linked to versatility in selecting learning methods and sharing information with peers. Students that take advantage of collective and self-directed learning opportunities to achieve higher academic success, both of which are essential issues in education for sustainability development.

Hitherto, literature on e-learning practice and its learners in the Vietnamese educational context is limited. This study thus provides not only significant contributions to the literature but also meaningful implications for the application of e-learning in Vietnamese higher education as well as other developing educational contexts.

Needs and learner's needs assessment

Needs are a main subject of most biological and social research sciences. In the socio-economic field, the issue of needs has been discussed in studies such as Maslow (1943), Herzberg (1965), McClelland (1988). It is a complex, multifaceted phenomenon, typical for all living things. Needs are also a characteristic that distinguishes the living object from its surroundings. Nonetheless, there has not been an agreed definition of the concept.

In education, various definitions of needs exist, and all are taking a learner-centered approach. According to Hutchinson and Waters (1987), there are two aspects of needs, including target needs and learning needs. Target needs refer to the desires, deprivations, and needs of learners to reach their goals, whereas, learning needs mean the desires to learn. In a similar stream of thought, Widdowson (1983) argued that learners' needs are a concept that brings two distinct interpretations, goal needs and process-oriented learning needs. Accordingly, learners' goal needs are related to the learning outcome and associated with the

curriculum purpose, while process-oriented needs are relevant to the educational facilities and pedagogical goals (Widdowson, 1983).

To understand learners' needs for incorporating them in the design of the curriculum, these are first to be assessed and analyzed. Mitchell (1993, p. 85) describes needs analysis as "*exploring existing training needs within the organization*". It helps the organizations to identify the areas where training should be done. Needs analysis not only identifies the areas that require attention, but also specifies the target, content, implementation, target market, and outcome of an intervention (Cohen et al., 2007). The assessment of needs occurs in different environments including communities (Rahtz and Sirgy, 2000), government organizations (Holton et al., 2000), health care centers (Barry et al., 2000) as well as educational institutions (McCaslin and Lave, 1976).

In higher education, the needs assessment process exists in various circumstances, such as distance learning, student organizations, or workgroups (Bishop et al., 1998). This process is indeed required in any strategic planning to set priorities for future actions (Witkin, 1995). The needs assessment results will be an essential part of the information used in the training decision-making process.

For e-learning, a needs assessment will help educational institutions link the needs of their target learners to the courses and programs they offer. According to Khan (2005), any educational institution wishing to invest in e-learning will need to conduct a needs assessment survey to find out what its potential learners want and if they are willing to enroll in the e-learning courses. Needs assessment, including both short-term and long-term needs will help organizations launch e-learning initiatives, and it is a strategic tool to develop e-learning programs. The needs assessment also provides information on technology and services that need the support needed for e-learning programs. Through a comprehensive need assessment process, an organization can set its e-learning goals (Khan, 2005). Hitherto,

research which focuses on the needs of learners for e-learning programs in tourism is scarce. This paper, therefore, aims at addressing this gap and providing implications to facilitate sustainable development in tourism education as well as the tourism industry.

The Technology Acceptance Model (TAM) predict the attitude towards using e-learning

TAM, developed by Davis (1989), is a model used to explain the behaviors of computer users. The two main constructs of TAM, i.e. the perceived usefulness and the ease of use, are indicated to influence the users' attitude toward using information systems (Davis, 1989). The model has been applied widely in the field of information technology/information systems. It has also been used to explain learners' perceptions, behaviors, and intentions towards e-learning programs in various studies such as Lee et al. (2009), Masrom (2007), Mohammadi (2015), and Qteishat et al. (2013). The model has therefore been extended and various constructs are then added to further explain the intention to use e-learning as well as the satisfaction towards e-learning. In addition to the two original factors of TAM, other antecedents of the intention to use e-learning, which are external to the learners, include educational quality, service quality, technical system quality, information quality, degree of support, instructor characteristics, teaching materials, design of learning contents (Lee et al., 2009; Mohammadi, 2015; Qteishat et al., 2013; Sun et al., 2008)

In addition to the above external factors, the internal ones which are different learners' characteristics such as internal motivations, computer/internet self-efficacy or computer skills, perceived playfulness, previous use were also found to significantly influence learners' perception and intention towards e-learning (Bhuasiri et al., 2012; DuCharme-Hansen and Dupin-Bryant, 2005; Qteishat et al., 2013). Therefore, in addition to factors from the TAM model and TAM extension model, this study proposes internal motivational factors for the learner's needs e-learning including IT skills and perception of playfulness.

Research model and hypotheses

Based on the literature review above, it is believed that a holistic model should be formed to assess the need to use e-learning programs of learners in the tourism field. The proposed research model, as shown in figure 1, consists of five independent variables including information technology (IT) skills, perceived usefulness, perceived ease of use, playfulness, and e-learning environment. The dependent variable is the learner's need for tourism e-learning programs.

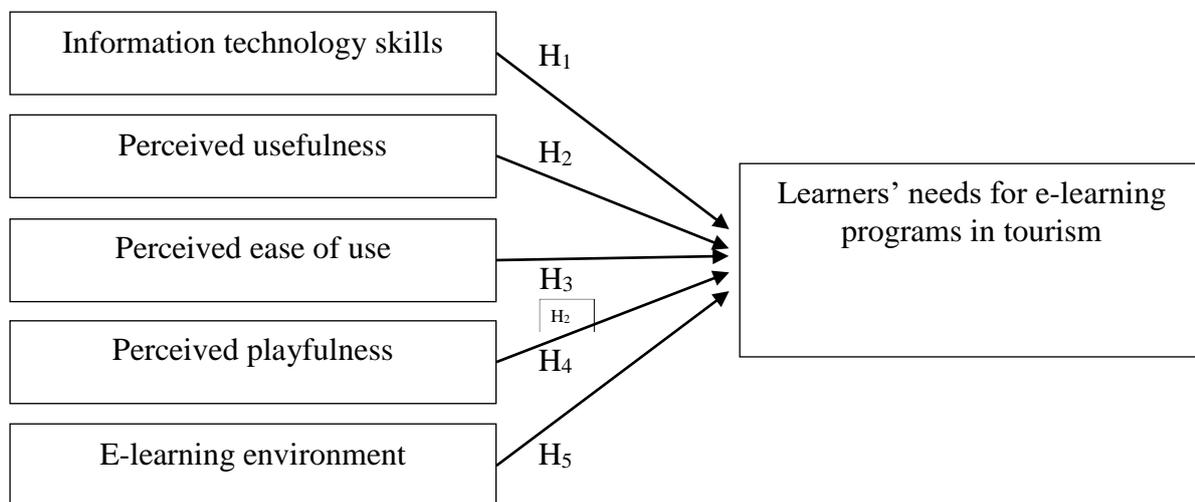


Figure 1: Proposed research model

To succeed in e-learning courses, students must have adequate IT skills. These skills include basic computer operation, file management, web browsing, and email operation. Other IT knowledge and skills with e-learning programs also include learners' attitudes toward computers, concerns about computers; experience using computers; ability to self-study on the Internet (DuCharme-Hansen and Dupin-Bryant, 2005; Sun et al., 2008). An empirical study on students' attitude towards using e-learning reveals that learners' IT skills is one of the critical factors in learner's need for web-based e-learning (DuCharme-Hansen and Dupin-Bryant, 2005). Thus, the first hypothesis is as follows:

Hypothesis 1: IT skills positively affect learners' needs in the tourism e-learning context.

Perception of usefulness is a significant factor determining the intention to use information systems. As defined by Davis (1989, p. 320), perceived usefulness is “*the degree to which a person believes that using a particular system would enhance his or her job performance*”. Literature suggested that the more positive the perception of the usefulness of the e-learning system is, the more likely e-learning will be used (Masrom, 2007). Thus, the second hypothesis is proposed as follows:

Hypothesis 2: Learners' perceived usefulness positively affects learners' needs in the tourism e-learning context

Additionally, perceived ease of use is also suggested to have an impact on the likelihood to use e-learning. This concept is defined as “*the degree to which a person believes that using a particular system would be free from effort*” (Davis, 1989, p. 320). Previous research indicated that perceived ease of use significantly contributed to the learners' behavioral intention toward e-learning (Ong et al., 2004; Chiu et al., 2007; Liaw, 2008). Thus, the third hypothesis is:

Hypothesis 3: Learners' perceived ease of use positively affects learners' needs in the tourism e-learning context

Perceived playfulness is considered as an essential factor to capture the motivation of learners for e-learning (Bhuasiri et al., 2012) and it is proved to significantly influence the intention to use e-learning (Lee et al., 2009). Perceived playfulness is a complex variable that includes personal pleasure, psychological stimulation, and attention (Csikszentmihalyi, 1990). Three aspects of perceptions of playfulness include the interaction with the system based on the web, the curiosity during an interaction, and the new or exciting elements during

interactions (Moon and Kim, 2001). Several studies on e-education noted the contribution of playfulness to the instructors and learners' acceptance of e-learning services. Integrating this construct into the TAM model, Lee et al. (2009) successfully captured both external motivations (perceived usefulness and ease of use) and intrinsic motivation (perceived playfulness) to explain students' intention to use e-learning services. Thus, the fourth hypothesis is:

Hypothesis 4: Learners' playfulness positively affects learners' needs in the tourism e-learning context

E-learning environments are where learners access online resources for learning materials and communication, as well as to get help, and receive reviews from the instructors (Lennon and Maurer, 2004). An active e-learning environment contributes to e-learning success (Siritongthaworn et al., 2006). This environment should include opportunities for interactions, synchronous and asynchronous communication to facilitate information exchange between learners and instructors, and online evaluation (Cao et al., 2009). Factors associated with a positive e-learning environment include social influence, learners' perception of interaction with others, diversity of assessments, and perception of autonomy support (Sun et al., 2008). A positive e-learning environment contributes to e-learning success (Siritongthaworn et al., 2006). Factors related to an e-learning environment include social influences, learners' perception of interaction with others, diversity in assessment effect on student satisfaction (Sun et al., 2008). Collaboration, engagement, and participation in the learning community in the e-learning environment help learners to motivate learners to participate in e-learning programs (Milheim, 2012). Thus, we propose that the learning environments also affect learners' needs in the e-learning context in the fifth hypothesis below:

Hypothesis 5: E-learning environments positively affect learners' needs in the tourism e-learning context

Methodology

Quantitative research with a survey questionnaire was used to explore factors affecting learners' needs for tourism e-learning programs in the Central Coastal region of Vietnam.

Measurements: the measurement scales of this study were designed based on previous studies. All evaluation criteria were measured by a 5-level Likert scale from 1-strongly disagree to 5-strongly agree. The evaluation criteria for IT skills were inherited from Sun et al. (2008). Measurement items of the perceived ease of use were adapted from studies by Lee et al. (2009), Mohammadi (2015), and Sun et al. (2008). Perceived usefulness was measured by the scale used in Mohammadi (2015), Sun et al. (2008), and Bhuasiri (2012). The scale for playfulness was adapted from Lee et al. (2009). The e-learning environment was measured by adapting items from Sun et al. (2008) and Paechter et al. (2010). The scale of the dependent variable is inherited and adjusted from the scale of Masrom (2007), Sun et al. (2008), Paechter et al. (2010) with the items measuring the attitudes of learners towards e-learning.

Sample: The survey, using a structured questionnaire, was conducted with four groups of potential learners including high school students (who may want to study tourism in the future), university students (who wish to study the second degree in tourism), college students (who want to obtain a university degree in tourism), workers in tourism businesses (who were not professionally trained in the tourism field and wish to do so). These potential learners locate in 6 main tourism provinces/cities in the Central Coastal region of Vietnam including Nha Trang, Quang Nam, Da Nang, Thua Thien Hue, Quang Binh, and Thanh Hoa.

According to the EU-ESRT project report about the labor force in the Central Coastal Region of Vietnam, managers indicated that training and retraining play an essential role for all job titles (EU & ESRT, 2015). There are nearly 80% of businesses in the accommodation sector that have set aside a separate budget for training; while only about 30% of travel businesses is having a different budget for this purpose (EU & ESRT, 2015). The majority of the training was internal training or on-the-job training. However, the quality of this training approach is often affected by a lack of budget and qualification of trainers. Also, the biggest obstacle for tourism workers is tough working hours, so it is not easy for them to participate in training courses or programs to improve skills and qualifications (EU-ESRT project, 2015). Therefore, the gap between supply and demand for tourism human resources training of the Vietnamese Central Coast region is significant. Thus, together with the opportunities and advantages of ICT applications, tourism e-learning programs are an urgent requirement to support the development of human resources in this sector.

Sample size: The primary data analysis method for this study was Exploratory Factor Analysis (EFA); the best way to determine the sample size is based on the ratio of observed / variable to the typical ratio in the studies is 5: 1 (Costello and Osborne, 2005). They also suggested that the larger the sample, the better for factor analysis, as this could help researchers achieve the study's goal and draw more effective conclusions for the whole population. Therefore, the study used a 20:1 ratio (Hair et al., 1979) to determine the sample size of the study. With a scale of 37 variables measuring five factors affecting the needs of learners for e-learning programs in the field of tourism, the minimum required size is 740. To ensure the number of research samples for data analysis, we distributed 1,200 questionnaires in six major tourism cities/provinces in the Central Coastal region (200 questionnaires each). A total of 1,109 respondents were received, indicating a 92.42% response rate. *Sampling method:* Quota sampling method (by the subjects, by localities, by universities, by

enterprises) and convenience sampling were used for this study. We conducted a paper-based survey from October 2019 to January 2020.

Data analysis, results, and discussion

Descriptive statistics

The sample, as shown in Table 1, included 674 (61.2%) female and 428 (38.8%) male respondents. 47.9% of respondents were between 18 and 24 years old; 28.5% were between 25 and 34 years old; 14.4% were under 18 years old; 7.2% were between 35 and 44 years old; 1.9% were between 45 and 54 years old, and 0.1% were 55 and older. The respondents were holding a variety of educational levels, in which the proportion of respondents with university degrees was the highest (55.7%). 71.4% were single and 28.6% were married. 33.5% were students and 66.5% were employed

Table 1: Respondents' profile

Demographic characteristics	Number (people)	Rate %
Gender	1102	100
Male	428	38.8
Female	674	61.2
Age	1107	100
< 18 years old	159	14.4
18 – 24 years old	530	47.9
25 – 34 years old	316	28.5
35 – 44 years old	80	7.2
45 – 54 years old	21	1.9
Over 55 years old	1	0.1

Demographic characteristics	Number (people)	Rate %
Educational	1105	100
High school students	146	13.2
College/ Technical school students	241	21.8
University students	616	55.7
Postgraduate students	102	9.2
Marital status	1089	100
Single	778	71.4
Married	311	28.6
Job	1109	100
Employees	738	66.55
Students	371	33.45

Validity and reliability

SPSS 22.0 was used to analyze the collected data. Cronbach's coefficient and exploratory factor analysis were used to evaluate the reliability and validity of the scale. The factor discovery analysis shows that the set of observed variables in each factor is unidirectional and factor analysis is consistent with the research data. The factor analysis used the principal component extraction method and Varimax rotation. Four items from perceived usefulness were deleted due to a low factor loading, i.e. less than 0.5. KMO coefficients value was greater than 0.5, the total explanatory variance (TVE) was greater than 50%.

Cronbach's coefficient was used to test the internal consistency among items of the questionnaire construct. The results of evaluating the reliability of the factors in the model

show that all factors achieve intrinsic consistency, Cronbach Alpha coefficients are greater than 0.8, the observed variables of each research concept have coefficients. The correlation between the total variable is greater than 0.3.

Table 2 summarizes factor loadings, Cronbach’s alpha, Eigenvalues, and variances explained of all indicator variables. The results indicated the presence of five factors with Eigenvalues greater than one. Cronbach’s alpha values greater than 0.8 indicate internal consistency among items of the same construct.

Table 2: EFA and Cronbach’s alpha results

Category	Independent variables										Dependent variables	
	EN		PEU		PU		IT		PL		NE	
	Items	Factor Loading	Items	Factor Loading	Items	Factor Loading	Items	Factor Loading	Items	Factor Loading	Items	Factor Loading
	EN7	0.755	PEU2	0.739	PU4	0.695	IT3	0.802	PL4	0.730	NE2	0.878
	EN4	0.737	PEU6	0.737	PU3	0.685	IT2	0.792	PL2	0.723	NE3	0.876
	EN6	0.728	PEU4	0.730	PU6	0.659	IT1	0.788	PL1	0.699	NE1	0.859
	EN5	0.722	PEU5	0.727	PU2	0.646	IT4	0.748	PL3	0.646	NE4	0.846
	EN3	0.719	PEU3	0.687	PU5	0.636						
	EN8	0.711	PEU1	0.684	PU1	0.628						
	EN2	0.693	PEU7	0.621	PU7	0.516						
	EN1	0.654										
	EN9	0.650										
Eigen value	13.469		2.539		1.954		1.349		1.208		2.992	
Total variance explained (%)	43.447		8.190		6.302		4.351		3.896		74.788	
Cumm. variance explained (%)	43.447		51.637		57.939		62.290		66.186		74.788	
Cronbach’s alpha	0.924		0.904		0.893		0.886		0.867		0.887	

EN = Environment; PEU = Perceived ease of use; PU = Perceived usefulness; IT = Information technology skills; PL = Playfulness; NE = Learner’s need

Regression analysis

Table 3: Results of regression analysis

Relationship between variables		B	β	t-Value	P-Value
E-learning environment	→ Learner's need	0.251	0.231	6.674	0.000
Perceived ease of use	→ Learner's need	0.169	0.164	4.707	0.000
Perceived usefulness	→ Learner's need	0.155	0.146	3.752	0.000
IT skills	→ Learner's need	0.088	0.099	3.282	0.001
Playfulness	→ Learner's need	0.118	0.119	3.464	0.001

Regression analysis was used to test the research hypotheses. The results of the regression model showed that five independent variables explain 37.9% of the variation of the independent variable, which is the learners' needs for the tourism e-learning programs (Adjusted R Square of 0.379). All predictors were significant in explaining the relationships. E-learning environment ($\beta = 0.231, p < 0.01$), Perceived ease of use ($\beta = 0.164, p < 0.01$), Perceived usefulness ($\beta = 0.146, p < 0.01$), Playfulness ($\beta = 0.119, p < 0.01$), IT skills ($\beta = 0.099, p < 0.01$) are positively related to learner's need as hypothesized. Thus, all hypotheses are supported.

Differences Among Learners

Previous studies have indicated the differences in behaviors, perceptions, and needs between learners' groups based on their demographic characteristics (Martin et al., 2003; Muilenburg and Bergem 2001; Glasgow, 2011). This study thus also conducted comparisons between learners' groups by educational level, age, and employment status. ANOVA was used to determine the differences in learners' perceptions towards the e-learning environment, perceived ease of use, perceived usefulness, IT skills, and playfulness.

Table 4: ANOVA test results

Independents	Factors affecting learners' needs for e-learning
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	E-learning environment	Perceived ease of use	Perceived usefulness	IT skills	Playfulness
Education	0.000	0.000	0.000	-	0.004
Age	0.001	0.000	0.008	0.001	-
Employment status	-	0.000	-	-	-

The results show that there were significant differences among learners' groups by education, age, and employment status regarding their perceptions towards e-learning (as shown in Table 4). The post hoc test indicated that the respondents with the highest educational level perceived environment e-learning, perceived ease of use, perceived usefulness more positively than those with the lower levels. However, this was the opposite in terms of perceived playfulness, meaning the respondents with the highest educational level perceived playfulness lower than those with the lower levels. Moreover, learners in the age group from 25 to 34 years old were found to have a higher appreciation for all four factors of e-learning, compared to the remaining age groups. This is therefore a potential target group for the e-learning programs. This young group of potential learners seems to have a desire to participate in e-learning to improve their qualifications and competencies in the tourism industry. The results also indicated that the respondents with a job in tourism perceived ease of use higher than the respondents who are students, possibly due to their experience.

Discussion

Identifying determinants of learners' need for e-learning programs in the tourism sector is essential for the sustainable development of tourism education. This study helps to provide an understanding of the potential learners in the Central Coast region of Vietnam for the development of e-learning programs in tourism. Through this empirical research, it is found that the factors of the TAM model (perceived ease of use, perceived usefulness) (Davis, 1989) and the extended factor (playfulness) (Lee et al., 2009) were important factors that positively affect learners' needs for tourism e-learning programs. These findings are supported by previous studies of learners' behavioral intentions for e-learning (such as Lee et

al., 2009; Sun et al., 2008; Chiu et al., 2007; Sun, 2005; Liaw, 2008; Ong et al., 2004; Bhuasiri et al., 2012; Mohammadi, 2015).

The study also indicates that the e-learning environment had a positive effect on learners' need for e-learning programs. The e-learning environment is the strongest factor predicting the needs of Vietnamese learners to attend the e-learning programs in the tourism sector. This shows that Vietnamese learners focus more on attributes related to values and direct benefits than on technology-related features. This result is in the same line with the study by Lee et al. (2009), where Korean learners put a great deal of attention on the characteristics of teachers, course design, interaction, and learning materials when planning to use e-learning.

While many studies on learners' intention to use e-learning no longer take into consideration the factor of learner's computer capacity, the anxiety in using IT tools might still exist within certain groups of users. Especially in the context of developing countries, even though IT has been included in educational programs, the lack of IT infrastructure makes it harder for learners to access and practice these skills. However, this study found that Vietnamese learners seemed to be largely familiar with the technology. Internal variables such as IT skills and perceived playfulness were found to have a positive effect on learners' needs for e-learning programs. The results correspond to related research such as Piccoli et al. (2001) and Sun et al. (2008). The results imply that to increase learners' needs and further improve the effectiveness of e-learning, it is important to strengthen IT education and training to give learners a better understanding of computers and related technology, as well as to prepare them with sufficient IT skills required.

In addition to the above findings, this research revealed the differences in terms of perceptions towards e-learning factors among groups of learners by age, education, and employment status. The results imply that e-learning programs for students with university or

lower educational levels should be designed with higher ease of use and integrated entertaining activities in order to attract this group of learners.

Conclusion

E-learning is an initiative for sustainable development (Azeiteiro et al, 2014) and the application of this learning approach in tourism programs can promote sustainable education and sustainable tourism development. To contribute to the understanding of e-learning, especially in the context of developing countries such as Vietnam, this study attempts to analyze learners' needs based on TAM and other additional factors. The results have shown that the e-learning environment is the most important factor affecting the needs of learners for e-learning programs. Technological factors such as ease of use are significant in predicting learners' needs for using e-learning. Meanwhile, the IT skills set is the factor that has the weakest impact on learners' needs in e-learning programs.

This empirical study provides useful suggestions for policymakers using e-learning and developers of e-learning systems in universities, especially in the context of the social distancing due to the COVID-19 pandemic. Due to the outbreak of the pandemic in 2020, almost half of universities in Vietnam switched to online learning (Pham & Ho, 2020). As a result, the official policies and regulations related to online teaching and learning have been issued by the Ministry of Education and Training (MOET) (Pham & Ho, 2020). This change in the teaching and learning approach, together with the support from MOET has certainly facilitated the development of e-learning and the adoption of ICT in teaching and learning in the future. This study, therefore, provides meaningful information for the development of e-learning in Vietnam. More specifically, the Central Coast region of Vietnam comprises various popular tourism destinations, such as Hoi An, Da Nang, Hue, Quang Binh which are

increasingly developing in both quality and quantity of tourism products and services. In order to facilitate this development, develop qualified human resources, by upgrading tourism curriculum and diversifying tourism education and training approaches, is among the strategies of Vietnam's tourism development (Vietnam Government, 2011). The development of e-learning in tourism education in Vietnam, especially in this region, is thus meaningful and essential for the development of tourism in the area. Therefore, the following implications are of significant value. Firstly, the development of e-learning programs must aim at technology features, including improving the ease of use and accessibility of the e-learning system, communicating the usefulness of e-learning, and creating a sense of joy and creativity when using e-learning. Secondly, it should focus on building a friendly e-learning environment such as diversifying the e-learning tourism curriculums, creating friendly e-learning environment interactions as well as personalized supports. Thirdly, it is necessary to improve the IT skills of learners by providing extra training, thereby increases the demand for e-learning.

These findings which facilitate to the development of e-learning would contribute to the sustainable development of both learners, education institutes as well as the tourism industry through its workforce. This learning approach, as indicated earlier, provides multiple benefits in various aspects of sustainability, such as reduce time and cost, saving energy and raw materials, increase competitiveness and innovation, meet the needs and expectation of stakeholders (Isaias & Issa, 2013). By applying this approach and proactively promoting education for sustainability, tourism education institutes can become role models of sustainable practices for the learners as well as the industry. Additionally, it provides the learners, who are the current and future workforce of the tourism industry, with the competences for SD necessary to deal with the complexity of sustainability issues within the industry (Lambrechts et al., 2013), which in turn contribute to the sustainable tourism

development. Finally, e-learning and its flexibility facilitate inclusive learning opportunities, which is one of the SDGs, for different groups of learners (Meskhi, Ponomareva, Ugnich, 2019). In Vietnam, internet access in rural Vietnam has been rapidly developed with 77% of people in these areas had internet access in 2020 (MMA, 2021), and the cost for internet is the cheapest in Southeast Asia and 12th in the world (Kinh te & Do thi, 2021). These conditions greatly facilitate the development of e-learning as well as inclusive education for SD in Vietnam. However, IT skills still need special attention, as indicated earlier, to stimulate the demand for e-learning.

Although this study has achieved its objectives, limitations are acknowledged. Firstly, the survey was conducted in 6 cities/provinces in the Central Coastal region of Vietnam, but not on a national level. Therefore, the generalizability of the study's findings might be limited. Secondly, the data was collected before the COVID-19 pandemic, when many learners were not familiar with e-learning (45.9%). As indicated above, the COVID-19 pandemic has induced a higher level of e-learning adoption. Future research is thus needed to offer a comparison of pre-and post- COVID-19 situations.

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