

To cite this article: Ma Thiem Phach and Nguyen Nhac (2026). Learning Engagement Of Physical Education Students In E-Learning-Integrated Major Courses At Thai Nguyen University Of Education. International Journal of Education, Business and Economics Research (IJEBER) 6 (4): 56-67

LEARNING ENGAGEMENT OF PHYSICAL EDUCATION STUDENTS IN E-LEARNING-INTEGRATED MAJOR COURSES AT THAI NGUYEN UNIVERSITY OF EDUCATION

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<https://doi.org/10.59822/IJEBER.2026.6404>

ABSTRACT

This study aimed to investigate the learning engagement of Physical Education students in E-learning-integrated major courses at Thai Nguyen University of Education. The study employed a combination of document analysis, questionnaire surveys, interviews, and statistical analysis. The participants comprised 92 undergraduate Physical Education students who had completed E-learning-integrated major courses and 15 instructors responsible for teaching these courses. The findings indicated that students demonstrated positive perceptions of the role and benefits of E-learning (Mean = 4.02), particularly in theoretical courses. However, their emotional and behavioral engagement remained at a moderately positive level (Mean = 3.58 and 3.41, respectively), reflecting limitations in self-directed learning, pro activeness, and interaction within the online learning environment. The factors influencing students' learning engagement, in descending order of importance, included learning management systems and technological infrastructure (Mean = 3.77), learner-related factors (Mean = 3.61), digital learning materials (Mean = 3.46), and instructor support and learning interaction (Mean = 3.24). Instructors' evaluations were generally consistent with students' self-reported responses, while further highlighting the need to improve students' pro activeness and interaction throughout the learning process. The findings provide practical evidence for improving the implementation of E-learning in major courses and enhancing students' learning engagement in Physical Education teacher education programs.

KEYWORDS: Physical Education; learning engagement; E-learning; major courses; teacher education.

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Published Online: July 2026

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1.0 INTRODUCTION

In the context of digital transformation in education, E-learning has become increasingly integrated into higher education as an effective approach to diversifying instructional methods, expanding access to learning resources, and promoting student-centered learning. In Physical Education teacher education, E-learning not only facilitates the delivery of theoretical content but also provides digital learning resources, instructional videos, and multimedia materials that support the acquisition of professional knowledge and practical skills. However, given the practice-oriented nature of Physical Education programs, the effectiveness of E-learning largely depends on students' learning engagement and the quality of instructional design.

Previous studies have consistently demonstrated the positive contribution of E-learning to teaching and learning in higher education. Research by Tarhini et al. (2013), Fryer and Bovee (2018), and Al-Jaberi (2018), together with studies conducted in Vietnam by Le Nam Hai (2021), Nguyen Thanh Phong et al. (2021), and Bui Tuyet Anh and Tran Hoang Cam Tu (2021), indicates that factors such as the quality of digital learning materials, technological infrastructure, instructor support, and learner characteristics significantly influence learning effectiveness and student engagement in E-learning environments. Nevertheless, most existing studies have focused on university students in general or on theory-oriented disciplines, whereas empirical evidence regarding Physical Education students remains limited.

At Thai Nguyen University of Education, E-learning has been implemented using a blended learning approach across several major courses. Although this implementation has produced encouraging outcomes, several challenges remain, particularly those associated with the practice-oriented characteristics of Physical Education, the quality of digital instructional materials, and the level of interaction within the online learning environment. These issues highlight the need for a comprehensive investigation into students' learning engagement and the factors influencing their participation in E-learning-integrated courses.

Therefore, this study aims to investigate the learning engagement of Physical Education students in E-learning-integrated major courses at Thai Nguyen University of Education. Specifically, the study examines students' cognitive, emotional, and behavioral engagement, identifies the factors and barriers influencing their learning engagement, and provides evidence-based recommendations for enhancing the effectiveness of E-learning implementation in Physical Education teacher education.

2.0 RESEARCH METHODS

To achieve the research objectives, the following research methods were employed:

Document analysis and synthesis method: Relevant national and international literature on E-learning, learning engagement, and Physical Education teacher education was reviewed and synthesized to establish the theoretical foundation for the study.

Questionnaire survey method: A five-point Likert-scale questionnaire was administered to 92 undergraduate Physical Education students and 15 instructors to investigate students' learning

engagement, the factors influencing their engagement, and the implementation of E-learning in major courses.

Interviews method: Semi-structured interviews were conducted with instructors to obtain supplementary information, clarify the survey findings, and evaluate the implementation of E-learning in major courses.

Pedagogical observation method: Students' learning activities in E-learning-integrated major courses were observed to assess their learning engagement, active participation, and interaction within the learning environment.

Statistical analysis: Descriptive statistics, including mean scores (Mean) and percentages (%), were used to process and analyze the data using Microsoft Excel.

3.0 RESULTS AND DISCUSSION

3.1. Overview of the Survey Participants and E-learning-Integrated Major Courses

3.1.1. Overview of E-learning-Integrated Major Courses

In recent years, Thai Nguyen University of Education has progressively integrated E-learning into its educational programs. In the Physical Education program, E-learning is implemented through a blended learning approach, in which each major course includes approximately one online credit combined with face-to-face classroom instruction. To date, E-learning has been incorporated into 14 major courses, including theoretical subjects such as Sports Hygiene and Medicine, Theory and Methods of Physical Education, Anatomy, and Sports Physiology, as well as practical courses including Gymnastics, Athletics, Football, Volleyball, Basketball, Martial Arts, and Badminton.

This blended learning approach enables the effective use of E-learning for delivering digital learning materials, online lectures, and self-directed learning resources while maintaining the essential face-to-face instructional time required for practice-oriented courses. This educational context provides an appropriate setting for evaluating the learning engagement of Physical Education students in E-learning-integrated major courses.

3.1.2. Overview of the Survey Participants

The survey participants were undergraduate students majoring in Physical Education at Thai Nguyen University of Education who had completed E-learning-integrated major courses. A total of 92 students participated in the survey, including 27 students from Cohort K57, 27 students from Cohort K58, and 38 students from Cohort K59. As all participants had prior experience with E-learning-integrated learning, they were well positioned to provide reliable evaluations of their learning engagement in this learning environment.

Table 1. Characteristics of the Survey Participants

No.	Classification	Category	n	%
1	Academic cohort	CohortK57(Fourth-year students)	27	29.3
		CohortK58(Third-year students)	27	29.3

		CohortK59(Second-year students)	38	41.4
2	Information technology(IT)proficiency	Good	12	13.0
		Fair	48	52.2
		Average	28	30.4
		Poor	4	4.4
3	Primary learning device	Smartphone	78	84.8
		Computer/Laptop	14	15.2

Most students self-rated their information technology (IT) proficiency as fair (52.2%) or average (30.4%). Only 13.0% of the respondents reported a good level of IT proficiency, whereas a small proportion (4.4%) rated their proficiency as poor. These findings indicate that although most Physical Education students possess sufficient digital skills to perform basic learning tasks in an online environment, they generally lack advanced technological competence. Consequently, students may become discouraged or engage only superficially with learning activities when encountering technical problems with the E-learning system or when digital learning materials are not designed to be sufficiently user-friendly and accessible.

Table 1 shows that 84.8% of Physical Education students primarily used smartphones for learning, whereas only 15.2% used computers or laptops. Although smartphones provide greater flexibility by allowing students to access learning materials anytime and anywhere, their small screen size makes it difficult for students to observe detailed movement techniques demonstrated in instructional videos, particularly those involving distant camera angles or movements requiring high postural accuracy. This limitation may negatively affect students' learning engagement, as prolonged learning on small screens can lead to visual fatigue and reduced concentration during online learning activities.

3.2. Current Learning Engagement of Physical Education Students in E-learning-Integrated Major Courses

To evaluate the current level of students' learning engagement in E-learning-integrated major courses, a questionnaire survey was conducted, and the data were analyzed based on the three dimensions of learning engagement: cognitive engagement, emotional engagement, and behavioral engagement. The survey results obtained from 92 undergraduate Physical Education students are presented in Table 2.

Table 2. Learning Engagement of Physical Education Students in E-learning-Integrated Major Courses

No.	Statement	Mean	Agree or Strongly Agree (n)	(%)	Neutral (n)	(%)	Disagree or Strongly Disagree (n)	(%)
1	Cognitive Engagement	4.02	72	78.3	16	17.4	4	4.3
1.1	E-learning is essential for learning today.	4.25	78	84.8	10	10.9	4	4.3

1.2	E-learning enables me to access learning materials more conveniently.	4.10	75	81.5	13	14.1	4	4.4
1.3	The learning content provided through E-learning is easy to understand.	3.72	63	68.5	25	27.2	4	4.3
2	Emotional Engagement	3.58	53	57.1	28	30.7	11	12.2
2.1	I enjoy learning in E-learning-integrated major courses.	3.58	54	58.7	28	30.4	10	10.9
2.2	I feel comfortable learning through E-learning.	3.65	57	62.0	26	28.3	9	9.7
2.3	I prefer studying theoretical courses through E-learning.	4.05	72	78.3	15	16.3	5	5.4
2.4	I enjoy learning practical courses that incorporate E-learning.	3.22	39	42.4	38	41.3	15	16.3
3	Behavioral Engagement	3.41	46	50.5	32	34.3	14	15.2
3.1	I actively participate in learning activities on the learning management system (LMS).	3.65	55	59.8	26	28.2	11	12.0
3.2	I regularly access online lectures and complete assigned learning tasks.	3.55	52	56.5	29	31.5	11	12.0
3.3	I spend additional time on self-directed learning using the LMS.	3.42	45	48.9	32	34.8	15	16.3
3.4	I actively participate in online discussions and respond to questions on the LMS.	3.02	34	37.0	39	42.4	19	20.6

Based on the survey results presented in Table 2, students' learning engagement in E-learning-integrated major courses was analyzed across three dimensions: cognitive engagement, emotional engagement, and behavioral engagement.

Regarding cognitive engagement, students demonstrated a positive perception of the role of E-learning in the learning process, with an overall mean score of 4.02, indicating a high level of recognition of its value in supporting learning within the context of digital education. Specifically, 84.8% of the respondents agreed or strongly agreed that E-learning is essential for contemporary

learning, while 81.5% reported that it facilitates more convenient access to learning materials and academic knowledge. However, the statement “*The learning content provided through E-learning is easy to understand*” received a comparatively lower mean score (Mean = 3.72) than the other cognitive engagement items. This finding suggests that although students clearly recognize the importance and benefits of E-learning, they continue to experience difficulties in understanding and assimilating learning content in the online learning environment. These results underscore the need to further enhance the quality of digital learning resources, together with the design and presentation of instructional content, in order to improve students' comprehension and strengthen their overall learning engagement.

Regarding emotional engagement, students expressed the most positive attitude toward the statement “*I prefer studying theoretical courses through E-learning*” (Mean = 4.05). This finding is understandable because E-learning enables students to save time and review recorded lectures repeatedly, allowing them to better understand competition rules, technical principles, and other theoretical content without relying extensively on handwritten notes. In this respect, students generally experienced feelings of comfort and confidence while learning through E-learning.

However, emotional engagement declined for practical courses (Mean = 3.22). This finding may be explained by the characteristics of Physical Education students, who generally prefer physically active learning and direct interaction during practical sessions. When practical content is delivered through smartphone screens—the primary learning device used by 84.8% of the respondents—students may feel constrained. Merely watching demonstrations without immediate opportunities for practice, or practicing individually in limited spaces, may reduce their enthusiasm and diminish the positive emotions normally experienced during practice with classmates. The fact that 41.3% of the respondents selected the neutral response suggests that many students regarded online learning for practical courses as only a temporary alternative rather than a learning approach they genuinely preferred.

In addition, the statement “*I feel comfortable learning through E-learning*” received a mean score of 3.65, indicating only a moderately positive emotional response. Overall, the Emotional Engagement dimension achieved a mean score of 3.58, suggesting that although Physical Education students generally accepted the use of E-learning, they had not yet developed a high level of emotional engagement with the online learning environment. The considerable difference between the mean scores for theoretical courses (4.05) and practical courses (3.22) further indicates that the current E-learning resources for practice-oriented courses are not sufficiently engaging to sustain positive emotional engagement among Physical Education students.

Regarding behavioral engagement, which represents the most direct manifestation of learning engagement by translating students' cognitive and emotional engagement into actual learning behaviors, the survey results indicate that this was the weakest dimension among Physical Education students, with an overall mean score of 3.41. The items “*I actively participate in learning activities on the Learning Management System (LMS)*” (Mean = 3.65) and “*I regularly access online lectures and complete assigned learning tasks*” (Mean = 3.55) received relatively favorable ratings, suggesting that most students were able to participate in online classes and

complete the required coursework. However, compared with the higher mean score for Cognitive Engagement (Mean = 4.02), a noticeable decline was observed. This finding suggests that students' participation in E-learning was largely driven by the need to meet course requirements and institutional regulations rather than by intrinsic motivation.

The item *"I spend additional time on self-directed learning using the LMS"* obtained a mean score of 3.42. Self-directed learning, including reviewing instructional videos and learning materials, is particularly important in E-learning-integrated major courses. However, only 48.9% of the respondents agreed or strongly agreed with this statement, indicating that the current digital learning resources may not provide sufficient motivation for students to voluntarily devote additional time to independent learning outside scheduled class hours.

The item *"I actively participate in online discussions and respond to questions on the LMS"* received the lowest mean score (Mean = 3.02), reflecting a relatively low level of active participation in online learning activities. Notably, 42.4% of the respondents selected the neutral option, while 20.6% disagreed or strongly disagreed with the statement. These findings indicate that students tended to remain passive during online learning, rarely asking questions or engaging in discussions, which may reduce both the quality of interaction and the effectiveness of learning in the digital learning environment.

Based on the above findings, several observations can be drawn regarding students' learning engagement in E-learning-integrated major courses, as follows:

The findings indicate a noticeable gap between students' cognitive engagement and their actual learning behaviors. Although students highly valued the role and necessity of E-learning in the learning process, their overall level of learning engagement, particularly in the behavioral dimension, remained only moderate. This finding suggests that positive cognitive engagement has not yet been fully translated into active learning behaviors within the digital learning environment.

Furthermore, the survey results revealed a clear difference in learning engagement between theoretical and practical courses. Students tended to demonstrate higher levels of engagement in theoretical courses delivered through the E-learning platform, whereas their engagement was considerably lower in practical courses. These findings suggest that E-learning is currently more suitable for delivering theoretical content than for courses requiring motor skill acquisition and hands-on practice.

In addition, the results on behavioral engagement indicate that students primarily focused on fulfilling mandatory course requirements, such as attending online classes and submitting assignments on time, while their participation in online interaction and discussion remained limited. Moreover, the relatively high proportion of neutral responses across several survey items suggests that a considerable number of students had not yet adopted a proactive approach to learning in the E-learning environment. This may be associated with the quality of digital learning resources, the practice-oriented nature of practical courses, and the suitability of students' learning devices.

3.3. Factors Affecting the Learning Engagement of Physical Education Students in E-learning-Integrated Major Courses

To provide a comprehensive understanding of the factors affecting the learning engagement of Physical Education students in E-learning-integrated major courses, the study examined four key groups of influencing factors: learning content and instructional materials, system and technology, instructors and learning interactions, and learner-related factors. The survey results are presented in Table 3.

Table 3. Factors Affecting the Learning Engagement of Physical Education Students in E-learning-Integrated Major Courses

No.	Influencing Factors	Mean	Agree/ Strongly Agree (%)	Neutral (%)	Disagree/ Strongly Disagree (%)
1	Learning Content and Instructional Materials	3.46	46.2	40.2	13.6
	Demonstration videos help me better understand movement techniques in major courses.	3.42	42.4	41.3	16.3
	Electronic lectures are visually designed and easy to follow and understand.	3.55	51.1	39.1	9.8
	Digital learning materials are appropriate for the practical characteristics of Physical Education courses.	3.35	44.6	39.1	16.3
	The use of technical demonstration videos helps me retain movement skills for a longer period.	3.52	46.7	41.3	12.0
2	System and Technology	3.77	70.1	20.4	9.5
	The university's E-learning system interface is easy to use.	3.85	73.9	18.5	7.6
	My Internet connection is sufficiently stable for effective online learning.	3.82	73.9	17.4	8.7
	My personal device (smartphone/computer) adequately meets the requirements for E-learning.	3.65	54.3	35.9	9.8
3	Instructors and Learning Interactions	3.24	38.9	44.0	17.1
	Instructors provide timely responses to students' questions.	3.28	41.3	43.5	15.2
	Online discussion activities help me better understand the course content.	3.15	38.0	45.7	16.3
	I can easily communicate with instructors and classmates through the system.	3.30	37.5	42.9	19.6
4	Learner-Related Factors	3.61	58.4	30.7	10.9

I have developed a habit of self-directed learning when studying through E-learning.	3.35	44.6	39.1	16.3
I feel confident using technology for learning.	3.88	71.7	22.8	5.5
I have a positive attitude toward E-learning.	3.60	58.7	30.4	10.9

Based on the survey results presented in Table 3, the study analyzed the factors affecting students' learning engagement from two perspectives: external factors and learner-related factors.

First, the System and Technology factor received the highest overall rating (Mean = 3.77), indicating that this was the most positively perceived factor influencing students' learning engagement. A total of 70.1% of respondents agreed or strongly agreed with the statements in this dimension. Students expressed particularly positive perceptions of the user-friendliness of the E-learning system interface (Mean = 3.85) and the stability of the Internet connection (Mean = 3.82). These findings suggest that the university has made substantial investments in technological infrastructure and Internet services to support the implementation of E-learning. Regarding personal learning devices (smartphones/computers), although the mean score was relatively favorable (Mean = 3.65), 35.9% of students selected the neutral response. This result indicates that, while personal devices were generally adequate for basic learning requirements, they did not provide an optimal learning experience for all students.

Second, the Learner-Related Factors dimension demonstrated a relatively high overall rating (Mean = 3.61), reflecting students' generally favorable readiness for E-learning. The most prominent finding was students' confidence in using technology for learning, which received the highest mean score (Mean = 3.88), with 71.7% of respondents expressing agreement. However, the habit of self-directed learning through the E-learning system received a considerably lower mean score (Mean = 3.35). This discrepancy suggests that although students possess adequate technological competence, they have not yet fully incorporated E-learning into their regular self-directed learning practices.

Third, the Learning Content and Instructional Materials dimension received a moderate rating (Mean = 3.46). However, the item assessing the appropriateness of digital learning materials for the practical characteristics of Physical Education courses received the lowest mean score within this dimension (Mean = 3.35). In addition, a relatively high proportion of students expressed neutral responses regarding the effectiveness of technical demonstration videos, with neutral response rates ranging from 40.2% to 41.3%. These findings indicate that the current digital learning materials are generally adequate to support learning but have not yet achieved sufficient quality or attractiveness to effectively enhance students' learning engagement.

Fourth, the Instructors and Learning Interactions dimension received the lowest overall rating (Mean = 3.24), making it the weakest among all the factors examined. The item assessing the effectiveness of online discussion activities recorded a relatively low mean score (Mean = 3.15), while 45.7% of students selected the neutral response. Similarly, communication with instructors and classmates through the E-learning system achieved only a moderate mean score (Mean = 3.30).

These findings suggest that the current digital learning environment lacks meaningful and dynamic interactions and has yet to provide an engaging learning community capable of fostering students' learning engagement.

3.4. Instructors' Evaluation of Students' Learning Engagement in E-learning-Integrated Major Courses

To complement the students' perspectives and enhance the objectivity of the findings, the study surveyed 15 instructors who were directly involved in teaching E-learning-integrated major courses for Physical Education students. The survey results are presented in Table 4.

Table 4. Instructors' Evaluation of Students' Learning Engagement in E-learning-Integrated Major Courses (N = 15)

Here is the table in a **Microsoft Word-friendly format**:

No.	Evaluation Indicators (Instructors' Perspectives)	Mean	High / Very High (%)	Moderate (%)	Low / Very Low (%)
1	Students proactively review learning materials before class	3.20	26.7	53.3	20.0
2	Students actively participate in interactions and discussions during online classes	3.07	20.0	60.0	20.0
3	Students maintain attention and engagement throughout the learning session	3.33	33.3	46.7	20.0
4	Students demonstrate creativity when producing technical demonstration videos	3.47	40.0	46.7	13.3
5	Students respond positively to instructors' announcements and feedback	3.73	66.7	26.7	6.6
Overall	Average score	3.36	37.3	46.7	16.0

The results presented in Table 4 indicate that, first, regarding learning discipline and compliance with course requirements (Indicator 5), this dimension received the highest evaluation from instructors (Mean = 3.73). A total of 66.7% of instructors reported that students responded positively to course announcements and instructional requirements. This finding suggests that Physical Education students generally maintain good learning discipline and comply well with the requirements of E-learning-integrated courses. Such a positive attitude provides a favorable foundation for instructors to effectively implement their teaching plans.

Second, regarding practical application and creativity (Indicator 4), instructors provided relatively positive evaluations of students' creativity in producing technical demonstration videos (Mean = 3.47). With 40.0% of instructors rating this aspect as high or very high, the findings suggest that

students demonstrate greater competence and enthusiasm when learning activities involve practical assignments, such as recording their own performance of technical skills, rather than passively attending online lectures. This finding reflects the practice-oriented nature of the Physical Education discipline, in which learning is inherently centered on physical activity and skill performance.

Third, regarding students' attention and sustained engagement during learning sessions (Indicator 3), this dimension received a moderately positive evaluation (Mean = 3.33). Although students generally attended online classes as required, instructors observed that approximately 20.0% of students were not fully attentive throughout the learning process. This finding highlights the challenge of designing more engaging instructional activities that can effectively sustain students' attention and learning engagement throughout the entire class session.

Fourth, regarding students' pro activeness and academic interaction (Indicators 1 and 2), these dimensions received the lowest mean scores among all the indicators (Mean = 3.20 and 3.07, respectively). Students' proactive preparation through reviewing learning materials before class was evaluated at only a moderate level, with the majority of instructors (53.3%) selecting the moderate category. Notably, participation in discussions and classroom interactions during online learning represented the weakest aspect of students' learning engagement (Mean = 3.07). Only three instructors (20.0%) rated students as highly active in contributing to discussions, whereas 60.0% considered their participation to be at a moderate level. These findings suggest that the online learning environment lacks active academic discussion, with students tending to adopt a passive learning role rather than engaging critically in classroom interactions.

Overall, the findings reveal a substantial degree of consistency between instructors' evaluations and students' self-reported learning engagement. However, instructors tended to provide more critical evaluations of students' pro activeness in learning. Although Physical Education students generally complied with course requirements and participated in learning activities, limited academic interaction and insufficient initiative in independently reviewing learning materials remained the primary barriers preventing learning engagement from reaching the expected level. These findings provide empirical evidence for proposing strategies to enhance the organization of online discussions and improve the attractiveness of digital learning materials, thereby fostering students' learning engagement in E-learning-integrated major courses.

4.0 CONCLUSION

The study evaluated the current status of learning engagement among Physical Education students in E-learning-integrated major courses at Thai Nguyen University of Education. The findings indicate that students generally demonstrated positive perceptions of the role and benefits of E-learning; however, their levels of pro activeness, interaction, and self-directed learning within the E-learning system remained limited, particularly in practice-oriented courses. System and technology were identified as the most favorable factors supporting learning engagement, whereas instructor–student interaction represented the greatest constraint affecting students' learning engagement. Instructors' evaluations were generally consistent with students' self-reported responses and further highlighted the limitations in students' pro activeness and interaction

throughout the learning process. Overall, the findings suggest that improving the quality of digital learning materials, strengthening instructor–student interaction, and encouraging students to take a more active role in the learning process are essential for enhancing the effectiveness of E-learning implementation in Physical Education major courses.

REFERENCES

1. Ministry of Education and Training (2021), *Circular No. 08/2021/TT-BGDĐT promulgating the Regulation on Undergraduate Education*. (in Vietnamese)
2. Thai Nguyen University of Education (2023), *Plan No. 679/KH-DHSP on breakthroughs in scientific, technological development, innovation, and national digital transformation of Thai Nguyen University of Education for the 2025-2030 period*(In Vietnamese).
3. Le Thi Minh Hoa (2021), *Application of E-learning in teaching at Vietnamese universities today*, Vietnam Journal of Education, 503(1), 24–28.
4. Nguyen Thi Thanh Huyen, (2024), *Students' interest in learning with blended learning models*, Vietnam Journal of Educational Sciences, (2).
5. Nguyen Thanh Phong et al, (2021), *Information technology-based learning (E-learning) in the context of the Fourth Industrial Revolution*, Vietnam Journal of Educational Sciences, and Special Issue 1.
6. Bui Tuyet Anh, & Tran Hoang Cam Tu (2021), *Factors affecting learners' satisfaction with E-learning training models: A case study at Nguyen Tat Thanh University*, Journal of Science and Technology, 2(4).
7. Ali Tarhini, Kate S. Hone & Xiaohui Liu (2013), *“Factors affecting students’ acceptance of e-learning environments in developing countries: A structural equation modeling approach*, International Journal of Information and Education Technology, 3(1), 54-59.
8. Nahil Mohammad Al-Jaberi, (2018), *The Use of Computer Programs and Applications by Undergraduates and its Relations to their Motivation toward E-learning and Academic Performance*, International Journal of Education & Literacy Studies, Vol 6, ISSN: 2202-9478