Journal of Education and e-Learning Research
Vol. 10, No. 3, 429-436, 2023
ISSN(E) 2410-9991 / ISSN(P) 2518-0169
DOI: 10.20448/jeelr.v10i3.4838

Teachers' perception of the necessity of applying online applications for organizing teaching activities at high school in Vietnam

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Abstract

E-learning has gained popularity as a method of delivering education recently and offers many advantages to enhance the learning experience for students. Technology allows teachers to design more interactive and engaging lessons that cater to different learning styles. It can also provide opportunities for teachers to incorporate virtual simulations and real-time data which can help students better understand complex concepts. The total number of survey samples was 187 teachers. Awareness of the need and purpose of applying information literacy in the organization of teaching activities was created to analyze. The results of the findings were interpreted in three ways: (i) Self-assessment of teachers' competence in applying technology in organizing teaching activities. (ii) Awareness of the necessity of using online applications in organizing teaching activities in schools. (iii) Awareness of the goal of using online applications in the organization of teaching activities. Based on the results of the current study, the article establishes the process of applying online applications in the organization of teaching activities and proposes recommendations for subjects directly related to the application of online applications. High school administrators, teachers and educational management agencies at all levels are using online innovation to organize teaching activities in high schools.

Keywords: Competence, E-learning, Online application, Teaching activity, Technology integration, Teacher.

Citation | Le, T. V., Nguyen, H. L., & Nguyen, H. T. (2023). Teachers' perception of the necessity of applying online applications for organizing teaching activities at high school in Vietnam. *Journal of Education and E-Learning Research, 10*(3), 429–436. 10.20448/jeelr.v10i3.4838
History:
Received: 11 April 2023
Revised: 23 May 2023
Accepted: 27 June 2023
Published: 17 July 2023

Publisher: Asian Online Journal Publishing Group

Funding: This research is supported by the University of Education, Hue University, Thua Thien Hue Province, Vietnam (Grant number: T.21-ETEP-02).
Institutional Review Board Statement: The Ethical Committee of the University of Education, Hue University, Thua Thien Hue Province, Vietnam has granted approval for this study on 25 June 2021 (Ref. No. T.21-ETEP-02).
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.
Data Availability Statement: The corresponding author may provide study data upon reasonable request.
Competing Interests: The authors declare that they have no competing interests.

Contents

Contribution of this paper to the literature
This article contributes to the argument that using technology, educators can design more interactive and engaging courses that are adaptable to various learning styles. It assists educational management agencies at all levels, high school administrators and teachers in Vietnam in using online innovation to coordinate teaching activities in high schools.

1. Introduction

E-learning has gained popularity as a method of education delivery in recent years. It frequently offers various courses and resources, allowing students to personalize their education to their particular interests and career objectives. It involves the support and enhancement of learning experiences through the use of electronic technologies. It can take the form of online courses, webinars and digital textbooks. In addition, it can be less expensive than traditional classroom-based education. Abbad, Morris, and De Nahlik (2009), Brenton (2008), and Fry (2001) define e-learning as a mode of education in which digital technologies are used to deliver educational content to students. This mode of education enables students to access educational materials from anywhere and at any time, making it ideal for students with hectic schedules or who reside in remote areas.

E-learning offers numerous benefits that can enhance students' learning experiences. One of the main advantages is flexibility. Students managing work, family and other responsibilities might find it helpful. It also offers the potential for increased engagement and interactivity and provides students with a more engaging and dynamic learning experience by incorporating digital tools such as videos, animations and interactive assessments. This can result in enhanced information retention and learning outcomes (Ally, 2004). E-learning can also facilitate collaboration and communication between instructors and students. Online discussion forums, virtual group projects and other digital tools can facilitate communication and collaboration when students are not physically present. (Hrastinski, 2008).

Means, Toyama, Murphy, Bakia, and Jones (2009) state that technology can also support personalized learning by enabling students to progress at their own pace and by providing individualized feedback and resources. In addition, technology can support formative and summative assessments allowing instructors to measure student progress and identify improvement areas.

The integration of technology into teaching and learning has a significant impact on student engagement and achievement. Ge, Ifenthaler, and Spector (2015) found that technology-based tools such as virtual laboratories, simulations and interactive multimedia resources improve student learning outcomes in science education. These instruments offer students opportunities for inquiry-based, hands-on learning which can lead to a deeper understanding and retention of scientific concepts.

Using technology in teaching and learning has numerous benefits that can enhance the learning of students. It allows for personalized learning experiences. Teachers can provide students with individualized resources and assessments that are tailored to their learning preferences and requirements by using learning management systems (LMS) and online platforms. This can result in increased student engagement and motivation as well as improved learning outcomes (Ge et al., 2015). Using technology in teaching and learning can provide students with enhanced learning opportunities. Technology enables the transmission of course material in numerous formats such as video lectures, interactive simulations and gamification which can accommodate various learning styles (Prensky, 2010). Moreover, technology can provide students with opportunities to engage with real-world problems, collaborate with peers and subject matter experts and participate in immersive learning experiences that can enhance their understanding of course concepts (Dede, 2010). This is especially useful for students who cannot attend traditional classes due to personal or professional obligations. In addition, technology can provide access to educational resources that may not be readily available in conventional classrooms such as virtual laboratories and simulations (Johnson & Aragon, 2003).

One of the most common difficulties when applying technology to teaching is technical. Technical difficulties may include problems with software, hardware or internet connectivity. These difficulties can cause frustration and disrupt the flow of the lesson and can be particularly challenging for teachers who may not have extensive technical knowledge (Bullen, Morgan, & Qayyum, 2011). To overcome these difficulties, teachers need adequate training and support in using technology and access to reliable technical support. Another challenge when applying technology to teaching is the integration of technology into existing teaching practices. Technology should not be used as a replacement for traditional teaching methods but rather as a tool to enhance teaching. The effective integration of technology requires careful consideration of the instructional goals and objectives (Garrison & Kanuka, 2004). Teachers need to carefully plan the use of technology in their teaching and ensure that it aligns with their instructional objectives. The effective use of technology in teaching requires a sound understanding of pedagogical principles to support student learning (Means et al., 2009). The integration of technology into teaching practices can be challenging and teachers may need to revise their teaching methods to accommodate the use of technology. The use of technology by teachers must also encourage student engagement and motivation. Teachers must be aware of the potential for technology to be a distraction and ensure that it is used in a way that supports student engagement and motivation. Another difficulty that students face when applying technology to teaching and learning is access to technology. All students do not have access to technology such as computers or the internet which can limit their ability to participate in online learning activities (Warschauer & Matuchniak, 2010). Students from low-income households, rural areas and developing countries are particularly at risk of having limited access to technology (Warschauer, 1998). This lack of access can create a digital divide where some students have an advantage over others in terms of their ability to access and use technology for learning. Additionally, software and hardware updates may require students to continuously adapt and learn new skills. This can be overwhelming and frustrating for students who may not have the technical knowledge or experience to troubleshoot issues. The use of technology in teaching and learning can also contribute to feelings of isolation among students and disconnection from the learning community (Ke & Kwak, 2013). In contrast, face-to-face interactions in the classroom can foster a sense of belonging and connectedness. Teachers need to design online learning that promotes interaction and collaboration to mitigate feelings of isolation.

One of the primary purposes of integrating technology into teaching and learning is to improve students' learning experiences. By using technology, teachers are able to construct more interactive and engaging lessons that are adaptable to various learning styles (Prensky, 2010). Technology also makes it possible to incorporate artificial simulations and real-time data which can aid students' comprehension of complex concepts. The application of technology in teaching and learning also serves to enhance student assessment. Graham (2006) states that technology can provide teachers with real-time data on student performance, allowing them to identify areas of strength and weakness in their teaching methods. In addition, technology can provide teachers with automated grading tools which can save time and increase grading accuracy. Incorporating technology into teaching and learning can also improve instructor productivity. Technology can assist in automating repetitive tasks, such as grading, allowing teachers to concentrate on more essential aspects of teaching such as lesson planning and delivery (Graham, 2006). This can help teachers become more productive and contribute to improved teaching outcomes. Additionally, technology can enhance communication between teachers and students. Online communication tools such as discussion forums and instant messaging can allow students to pose questions and receive responses from their instructors (Prensky, 2010). This can increase student engagement and comprehension and provide teachers with valuable feedback on their teaching techniques.

2. Methods

2.1. Participant and Procedure

The current research sample was selected through random sampling and stratified sampling based on geographical area criteria. Data was collected from public elementary schools (high schools), secondary schools and high schools in Hue City, including in the south of Hue City: Truong An High School; Hung Vuong Secondary School; Nguyen Truong To High School; and in the north of Hue City: Huong So High School; Tran Cao Van Secondary School; Dang Tran Con High School to survey and evaluate the practical application of information literacy in renovating teaching activities organization. When conducting survey sampling at each school, the authors use systematic random sampling to select the number of survey samples.

2.2. Instrument

Awareness of the need and purpose of applying information literacy was developed in order to organise teaching activities. Survey content is rated on 5 levels: totally unnecessary or strongly disagree, unnecessary or disagree, yes, no or hesitant, required or consent, very necessary or strongly agree. The number of survey questionnaires distributed by teachers was 192 and the number of valid questionnaires collected was 187 (the total number of surveys conducted was 97.3% compared to the expected number of samples).

3. Results

3.1. Self-Assessment of Teachers' Competence in Applying Technology in Organizing Teaching Activities

In order to get an overview of the ability to apply technology in the teaching activities of high school teachers in Hue City, we have asked for teachers' self-assessment opinions according to Rubric's assessment. Teachers' ability to apply technology in teaching is assessed according to five component competencies. Each horizontal row marks a descriptive phrase about teachers' information technology competence in teaching and educational activities (five component competencies). Each vertical column describes the level (increasingly) from the lowest level to the highest level (no competency assessment and creative use in all situations) (Brooks-Young, 2010). Table 1 represents competence for each of the five applied competency components.

Table 1. Information technology application competence of teachers.

Levels	**No competence assessment**	**Initially using**	**Usually use**	**Use situational adaptation**	**Appropriate use in all situations**	**Creative use in all situations**
The use of teachers for students	Never used technology.	Do not regularly plan for students to practice computers.	Regularly support students on their studies computers.	Encourage all students to leverage technology for projects and assignments.	Regularly leverage technology into the classroom or laboratory or another environment.	Design and implement new technology environments.
Teacher's usage plan	No specific plan before applying technology.	Freedom of choice (No orientation) or student-oriented activities.	Plan and rehearse the lesson.	Integrate technology into lessons and practice in traditional classrooms.	Plan appropriately for the use of technology in different teaching situations.	Create new instructional models with technology.
Teachers' understanding of technology	Not interested in learning technology.	Understanding and using technology.	Succeed in using technology on a basic level.	Start learning and experimenting with new technologies.	Exploit and use technology proficiently with the ability to be flexible in its use.	Constantly experimenting with new technology.
Scope and understanding of procedures and operations	Not using the correct scope and sequence of technology.	Can use the scope and sequence of technology.	Can independently use the scope and sequence of technology.	Deploy and implement all skills in terms of technology scope and sequence.	Make full use of all skills in scope and sequence in the curriculum.	Create an environment where technology is easily used as a tool.
Levels of participation of teachers	No teacher involvement in teaching with technology applications.	Limit the participation of teachers in teaching activities with the application of technology.	Teachers play an active role in introducing technology-based lessons.	Teachers can only have one technology project related to the subject education program once a year.	Teachers develop many technology projects related to subject education programs for students (interdisciplinary).	Teachers go beyond in pre-existing patterns about using technology and taking risks to get technological advantages.

The results of the statistical analysis of the teachers' self-assessment of the application of technology in the organization of teaching activities are presented in Table 2.

Table 2. Results of self-assessment of teachers' competence in applying information technology.

Levels	No competence assessment	Initially using	Usually use	Use situational adaptation	Appropriate use in all situations	Creative use in all situations
Utilization of technology by teachers for students	0	60.3	14.6	17.2	6.70	1.20
Teacher's usage plan	37.6	32.5	10.6	12.9	5.60	0.80
Teachers' understanding of technology	17.0	43.9	21.4	10.9	6.80	0
Scope and understanding of procedures and operations	50.5	12.4	11.7	13.8	7.70	1.40
Levels of participation of teachers	0	8.00	15.8	0	0	0

Teachers at high schools in Hue City have self-assessed their ability to apply technology in teaching according to the competence for each level of the five components of applied competence which are reflected in detail.

The first component of competence "utilization of technology by teachers for students" accounted for the largest proportion with 60.3% at the level of "initially using" with the specific expression. "Teachers do not regularly plan for students to practice computers". The percentage is lower in this competence (1.2%) at the level of "creative use in every situation" and "teachers design and implement new technology environments".

The second component of competence is "teacher's usage plan," accounted for the largest proportion with 37.6% and 32.5%, respectively at the level of "no competence assessment" and "initially using" with the expression specifically, "there is no specific plan before applying technology" and "freedom of choice (no orientation) or student-oriented activities". The lowest rate in this competence was 5.60% at the level of "appropriate use in all situations" with the expression "plan appropriately for the use of technology in different teaching situations".

The third component of competence "teachers' understanding of technology", the expression "teachers have to deal with understanding and using technology" was chosen by teachers with 43.9% of the expressions of this competence at the initial level of use. The expressions "teachers exploit and use technology proficiently and have the ability to be flexible in their use" and "teachers start to learn and experiment with new technologies" were rated the lowest by the teachers themselves with 6.80% and 10.9% respectively at the level of "appropriate use in all situations" and "use situational adaptation".

The fourth component of competence "scope of use and understanding of processes and operations", expressed as "not using the correct scope and sequence of technology" accounts for 50.5% with the level of "no competence assessment". Expressions of "teachers making full use of all skills in terms of scope and sequence into curricula" and "teachers creating an environment where technology is easily used as a tool" were the lowest in the expression of this competence.

The fifth component of competence "level of participation of teachers" has many teachers who do not participate in self-assessment in such manifestations. Teachers have one technology project related to the subject education program once a year. They develop many technology projects related to subject education programs for students (interdisciplinary) in the pre-existing patterns of using technology and taking risks to get technological advantages. The survey shows that in this component's competence only 15.8% of teachers play an active role in introducing technology-based lessons and 8.0% of teachers express that their participation in teaching activities with the application of technology is limited.

3.2. Awareness of the Necessity for Organizing Teaching Activities in Schools

The cognitive factor of teachers (the subject of teaching activities) is considered an important basis for conducting teaching activities in the process of organizing teaching activities at school. The results of a survey of teachers at high schools in Hue City, Thua Thien Hue Province about how aware they are of the need to use information learning methods in planning classroom activities for students showed that teachers who filled out the survey questionnaires thought it was very important to use online applications to plan classroom activities (80.6% of teachers said it was "very necessary" and 16.0% said it wasn't).

3.3. Awareness of the Goal for the Organization of Teaching Activities

The awareness of the importance and necessity of using online applications in the organization of classroom teaching activities has a close relationship. The results of the survey on the perception of teachers of high schools in Hue City about the goal of using online applications to organise classroom teaching activities are shown in Table 3.

The results of the statistical analysis in Table 3 show that teachers determine the goal of applying online applications to teaching organizations to support teaching activities. Using online tools helps students have a good attitude towards learning, helps teachers in illustrate, explain, demonstrate and interpret lesson content in a way that is general, intuitive, vivid and receptive; help teachers come to a conclusion, review, summary, and systematization of knowledge content; helps teachers test and assess students' receptive competence, understanding, and mastery of knowledge, so they can change their teaching activities in an appropriate manner.

Specific goals are determined by teachers such as "support innovation in content, teaching and learning methods and assessment in all subjects" (M = 3.87, SD = 0.90). Support to organize activities according to the teaching process (starting, forming new knowledge, systemizing knowledge, etc.) (M = 3.84, SD = 0.76) and support to organize other teaching methods and techniques (group work, question and answer, visualization) (M = 3.82, SD = 0.83). "Enhance positive interaction between teachers and students" (M = 3.80, SD = 0.86) towards the teaching objectives of the identified lesson.

Table 3. Awareness of the goal of using online applications in organizing classroom activities.

No	Goal	M	SD
1	Support innovation in content, teaching and learning methods and assessment in all subjects.	3.87	0.90
2	Enhance positive interaction between teachers and students.	3.80	0.86
3	Create a positive and vibrant psychological atmosphere in the classroom.	3.69	0.75
4	Build lively and intuitive lectures (Channels of text, images, sound, etc.).	3.79	0.81
5	Stimulate students' learning attitudes.	3.69	0.88
6	Encourage learners to use technology for learning.	3.65	0.79
7	Using regular and periodic assessment (Formative assessment), receiving signals against the level of knowledge, skills and attitudes of students.	3.75	0.76
8	Developing teachers' skills in applying technology to teaching.	3.70	0.83
9	Support to organize activities according to the teaching process (Starting, forming new knowledge, systemizing knowledge, etc.).	3.84	0.76
10	Support to organize other teaching methods and techniques (Group work, question and answer, visualization).	3.82	0.83

In addition, intuitive lectures (channels of text, images, sound etc.) (M = 3.79, SD = 0.81) is a goal highly appreciated by teachers related to specific aspects of classroom teaching, supporting teachers' teaching activities and students' learning activities. "Using regular and periodic assessment (formative assessment), receiving signals against the level of knowledge, skills and attitudes of students" (M = 3.75, SD = 0.76); "developing teachers' skills in applying technology in teaching" (M = 3.70; SD = 0.83). Stimulate students' learning attitude through active brain movement (M = 3.69, SD = 0.88) encourage learners to use technology for learning (M = 3.65, SD = 0.79). Teachers identify the essential goal of using online applications in teaching in many aspects. We believe that this is an important basis for promoting the practical application of technology in teaching innovation today in high schools in response to the implementation of the 2018 General Education Program.

4. Discussion

The purpose of this study was to evaluate the competence of high school teachers in Hue City to integrate information technology into their instruction. The research came to the following conclusions based on the available information: (i) Self-assessment of teachers' competence in using technology in organizing teaching activities. (ii) Awareness of the necessity of using online applications in organizing teaching activities in schools. (iii) Awareness of the goal of using online applications in the organization of teaching activities.

The first component competence "utilization of technology by teachers for students" accounted for the largest proportion with 60.3% at the level of "initially using" with the specific expression, "The second component competence, " teacher's usage plan" accounted for the largest proportion with 37.6% at the level of "no competence assessment" with the expression specifically. The third component competence, "teachers 'understanding of technology", the expression "teachers have to deal with understanding and using technology" was chosen by most teachers with 43.9% of the expressions of this competence at the initial level of use. The fourth component's competence "scope of use and understanding of processes and operations" expressed as "not using the correct scope and sequence of technology" accounts for 50.5% with the level of "no competence assessment". The fifth component competence "level of participation of teachers" had active role in introducing technology-based lessons accounted for 15.8% at the level of "usually use". Technology is the educational instrument that enables authentic learning experiences for students and fosters critical thinking, problem-solving, creativity, teamwork and communication skills (Trilling & Fadel, 2009). It has also been shown that teachers at the high school level have initially made changes in their teaching methods, planning to organize teaching activities that integrate technology to give students the opportunity to experience and use technologies in learning. The teacher's centered method should be changed to learner-centered (Prensky, 2010). Researchers found that when technology and effective teaching methods are combined, both students and teachers gain significantly (Glassett & Schrum, 2009). According to Glassett and Schrum (2009), effective technology integration leads to better attitudes towards teaching and learning, higher levels of student achievement and a deeper comprehension of curricular content.

The second component was "awareness of the necessity of applying online applications in organizing teaching activities in schools". In terms of perception, the majority of teachers are properly aware of the necessity and purpose of using online applications for teaching activities. However, there are some teachers who are not properly aware of the importance and necessity of using teaching applications in teaching activities. The survey results also show that teachers are aware of the necessity of applying information literacy when organizing teaching activities in class for different reasons. Among them, the main reasons are meeting the trend of innovation and using technology to teaching in the new context, overcoming the limitations of online teaching, improving teachers' technology application skills and creating opportunities for students to use technology in a proper way for learning purposes. Thus, the majority of teachers highly appreciate the necessity of using teaching aids in organizing teaching activities in class. This is considered a good indicator because it establishes a basis for forming positive attitudes and behaviors towards the application of information literacy in organizing teaching activities in class at school. Students demonstrated greater cognitive improvements as a result of the teachers' technology and engineering behavior which influences students' perseverance with a range of engineering and technical tasks and stimulates and maintains their interest. The development of teachers' creative competence (Cropley, 2015; Lee & Kemple, 2014), teaching practice, teachers' behavior in the classroom (Rohaan, Taconis, & Jochems, 2012) and

attitudes have been linked in research (Hidi & Renninger, 2006). Studies have shown a connection between teachers' attitudes, perceptions and experiences and their instructional strategies (Lee & Kemple, 2014; Nguyen et al., 2017). The research results show that teachers emphasize the necessity of applying technology in teaching and online applications in organizing teaching activities. This is consistent with a number of studies on online teaching such as those by Biasutti (2011) confirming that online teaching is an education sector that is growing strongly as it has various advantages for educational institutions. Educational institutions are constantly looking for new ways to approach this market (Singh, O'Donoghue, & Worton, 2005).

In Vietnam, the different teaching conditions of each education institution have recently strengthened the application of IT to support the innovation of content, teaching and learning and assessment methods. Priority is given to the implementation of highly synchronous solutions, including digital data warehouses, e-learning lectures (online lectures), electronic lesson design software and IT application deployment that must be practical and effective. Paying attention to IT application in different teaching conditions requires a learning management, system, teaching through a learning content management system (LCMS), online teaching systems, information storage devices and other supporting software. E-learning offers advantages like cheaper training prices, access to a large peer network and more recent learning resources (Mohammadyari & Singh, 2015). Furthermore, e-learning provides flexibility in terms of time and location allowing learners to study at their own pace and from anywhere with an internet connection. It also reduces the environmental impact of traditional classroom-based learning by eliminating the need for commuting and paper-based materials. With the increasing demand for online learning, educational institutions are incorporating technology-based solutions such as Learning Management Systems (LMS) and Massive Open Online Courses (MOOCs) to provide students with flexible and accessible learning opportunities. These advancements have revolutionized the way education is delivered and consumed.

5. Conclusion

Teachers need to consider what abilities they have in the field related to teaching or content knowledge? What skills do teachers feel they need to learn more about and where will I learn them? After assessing the areas of strength and areas for improvement which goal does the teacher choose to purposefully implement? What do teachers want to achieve through their goals? What activities will the teacher do to achieve the goal? How will the teacher work to achieve the desired results? What assistance, support or resources are available to help the teacher succeed in achieving the identified goals?

The content of the research has preliminary assessed the ability to apply IT in the teaching of high school teachers in Hue City. The research results show that teachers self-assess their ability to apply technology in teaching in schools with five component competencies: "utilization of technology by teachers for students", "teacher's usage plan", "teacher's understanding of technology", "scope and understanding of processes and operations" and "the level of participation of teachers". The results of this survey are the basis for each teacher to build their own plan to foster their own IT competence in teaching. In terms of perception, most teachers are properly aware of the need and purpose of applying online applications in teaching activities. However, there are some teachers who are not properly aware of the importance and necessity of using online applications in teaching activities. This article establishes the process of using online applications in the organization of teaching activities and proposes recommendations for subjects directly related to the application of online applications based on the results of the current situation study. High school administrators, teachers and educational management agencies at all levels are using online innovation to organize teaching activities in high schools.

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