

GENERAL INFORMATICS TEACHING WITH B-LEARNING TEACHING MODEL

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ABSTRACT

Blended learning (B-learning), a combination of face-to-face teaching and E-learning-supported-teaching in an online course, and Information and Communication Technology (ICT) tools have been studied in recent years. In addition, the use of this teaching model is effective in teaching and learning conditions in which some certain subjects are appropriate for the specific teaching context. As it has been a matter of concern of the universities in Vietnam today, deep studies related to this topic is crucial to be conducted. In this article, the process of developing online courses and organizing teaching for the General Informatics subject for first-year students at the Hue University of Education with B-learning teaching model will be presented. The combination of 60% face-to-face and 40% online learning.

Keywords: *B-learning, general informatics, ICT, online*

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INTRODUCTION

Blended learning (B-learning), an instructional approach in which computer has a role as an instructional media (Bonk & Graham, 2006), has been implemented in higher education in many countries. It has been proven by many scientists that B-learning has improved student achievements (Husamah, 2015; Joseph, 2017; Manwaring, Larsen, Graham, Henrie, & Halverson, 2017). Moreover, it enables students to learn in a more flexible way, in term of time and places. As E-learning become one of the methods used in B-learning, it creates high interactive 'class'. Multimedia technology allows learners to exchange information more easily, as well as offering learning contents that suit their abilities and interests.

One of the B-learning principles identified by Lai et al. (2016) is consolidation in term of utilizing various types of learning activities including online discussions so that students do reconsider, reflect, and consolidate the knowledge they gained. Online teaching (E-learning) in the form of synchronous or unsynchronous interaction between teacher and learners has been giving benefits in teaching and learning. It costs considerably lower than the traditional classroom (FAO, 2011), enables

both teacher and students to conduct learning anywhere and anytime (Epignosis LLC, 2014).

In addition, not only do education and training equip the learners with knowledge but human personality also does the same. During school hours, learners are trying to receive the information delivered (lecture materials), as well as keep their attention to the teacher who inspires dreams, ideals, and passions for them. In this case, online virtual learning is impossible to do these functions. Therefore, blended learning (B-learning) will be the key to bridging the gap arises in term of utilizing a cutting-edge technology (E-learning) as well as conducting a good interaction between educators (teachers/lecturers) and learners.

B-learning is relatively new in Vietnam, while this teaching method is gradually occupying a strong trend in education. The problem is that there should be a theoretical basis for this teaching model as considerable as valid information about its effective use by considering teaching conditions, certain subjects, and its suitability of specific teaching context in the universities of Vietnam today.

The current teaching conditions in Vietnam have been being a serious problem to implement B-learning due to some reasons. In their first year, the students often have no sense of self-learning. In addition, the downside of an

online class is that the interactions occur between instructors and students to ask questions directly is often difficult (Dung, 2014).

Among various basic modules for students, General Informatics (GI) is the basic subject for most of the students as well as for biology students, biology education students, and environmental biology students in universities in Vietnam today. This module aims to provide and train students with the basic knowledge and skills in computer use. By conducting this practical work during their study, the students are expected to be able to apply the skills enacted to their research as well as to their professional work in the future. Take Biology Educational students as an example. After receiving this general informatics materials, biology education students are expected to be able to utilize their skills to analyze biological data such as using Popgen to analyze their molecular research data (Fatmawati, 2012), as well as apply their GI understanding to estimate carbon stock of evergreen broadleaf forest using object-oriented classification technique with remote sense data and so forth (Dung, 2014). These because the materials delivered for the general informatics teaching can be related to biological and environmental subjects.

Therefore, it is crucial to conduct a research which elaborates a teaching method empowered by ICT skills to promote active teaching and learning. This will provide adequate information for teachers in promoting active learning as well as educating students to be more familiar with self-learning.

METHOD

Design and build the online course

The online course is based on five key elements: learner, course structure, online design, interactivity and usability (<http://203.113.132.166/course/view.php?id=56>).

Learners. This course was designed for first-year students with the goal of providing and training the students with the basic knowledge and skills in computer use. Thus, these experiences can be implemented in students' practical works, research, as well as in their professional work in the future. The content of the course by considering the standard of information technology skills commanded the Ministry of Information and Communication of Vietnam (Circular No. 03/2014/TT-BTTTT,

Ministry of Information and Communications, Hanoi, 2014) which must be achieved by students.

Course structure. The course consists of four chapters, each of which is a module that includes the objectives of the chapter, the content of knowledge, reference materials, activities and tasks of the chapter, exercises, and assessment of the chapter. At the end of each chapter, there will be practice exercises based on samples containing the skills expected to be enacted by the learners.

Website design to online learning. The website was designed on the E-learning system of Hue University of Education (2015-2016) and the E-learning system of Hue University Learning Resource Center (2016 - 2017). The website was designed in a clear and logical way, with simple and easy navigation which lead to ease learners to interact in the course. This easy-to-understand interface was also balanced between its text and graphics.

Interaction. The course has linked the resources, definitions, videos, and slides used in the lesson materials. The assessment tests included various forms (self-examination and multiple choice tests). In addition, the learners could interact directly with the page or upload their files.

Usability. The online course works well with guaranteed accessibility, the right links with the right functionality, as well as the design.

To comply with the regulations and training of the University of Education. GI course was implemented in the form of B-learning with the combined level in which the traditional learning plays a leading role (60% face-to-face) and the online learning plays a supporting role (40% online) (compulsory). Teachers provided the materials, online lectures for learners, self-study orientation for learners. Meanwhile, the learners enhanced their self-study, looked up the expanded knowledge, and actively carried out online learning activities i.e. exchanging, discussing, taking quizzes, combining group study forms, and self-learning.

The teaching-learning model was Face-To-Face which was supported by internet-integrated access. This model was used as its suitability to be applied in diverse classes with learners who have different segments of ability as well as knowledge level of Informatics. In addition, the model is in line with the current training regulation, which evaluates the learning and assessment process that needs to be carried

out at the school in conjunction with the assessment of learning activities on the online course site, which cannot be fully implemented on the online learning management system.

Based on the E-learning system of the Hue University of Education and the Hue Learning Resource Center, we built the GI course for 41 of first-year students in 2016-2017 and for 52 of first-year students in the academic year 2017-2018 at Hue University of Education. Students were offered a free online account to log into the online course.

Teaching organization

Develop blended lessons: After defining lesson objectives and content, the content was divided into three groups. Some of them were presented during school hours, and the other was organized into electronics lectures and learning resources to be posted as online course materials.

Organizing teaching in B-learning: Based on the knowledge learned through the learning resources, especially video tutorials on the application software of the GI subject was assigned. Students defined learning tasks, improved knowledge, and asked questions during school hours. The teachers synthesized and organized discussion before conducted the examination and evaluation of the lesson contents. During class hours, students could practice on their own computer, while at home, they could practice, with or without interaction with teachers and/or with their classmates. There also computer room provided by the school to be utilized by students. This enabled them to utilize this facility under teachers' guidance to interact with their friends directly or through ICT tools.

Teachers and learners' interaction: Teachers did not merely attending the class to announce a series of information and left as in the traditional classroom. With the characteristics of the GI course which was supported by ICT, theoretical lessons in the face-to-face meeting, becoming hands-on instruction, using learning resources, and answering students' questions. Classroom space was expanded with hands-on video tutorials, interactive tools such as social networking, e-mail, forums, etc. as well as frequent feedback from tutors and classmates. Teachers also developed the content which enabled them to access, to learn and to discuss the unit. Moreover, it provided students the

skills they need to explore, acquire and process information effectively.

Test and evaluation: At the end of each chapter, the exercises and tests were given. Practical exercises were submitted to the website with the assignment tool, students could post questions and discussions in closed groups created by the class via the social networking tool i.e. Facebook. The test was done through a number of multiple-choice questions. Students got their immediate results and answers after taking the test.

It is important for the students to be proactive and conducting active learning. By implementing B-learning, not only do the learners collect and memorize information but they also must know how to analyze, synthesize and process the information obtained effectively. This approach has been proven to give meaningful learning experiences for students in more effective and efficient way (Garrison & Kanuka, 2004). Maintaining a sense of discipline and learning motivation is even more meaningful for this type of learning. In addition, the classroom hours and online self-study determine the quality of learning of the learner.

The course content has been organized at this address: <http://203.113.132.166/course/view.php?id=56> in which also served in Figure 1, Figure 2, and Figure 3. After the experiment, we conducted the survey in which the questionnaire can be found in Table.1 and website address: https://docs.google.com/forms/d/e/1FAIpQLSdtvflPrccXGvFpx96VfMeFIaSNcAfLlIkJ48x_UjjCPEaJYA/viewform.

RESULTS AND DISCUSSION

The research results are served in Figure 4. The diagram shows the results survey of students' opinion about B-learning implemented in General Information subject in Hue University of Education, Vietnam. There were six indicators asked to be rated by students. The results were: 1) the course design (interactive, rich content, efective) (79%); 2) the use of the course in improving students' informatics practical skill (87%); 3) the use of the course in improving students' online learning skill (79); 4) the effectiveness of hands-on exercise efectivities (90); 5) the frequent of students' interaction through B-learning (82); 6) the students' perception of the importance of Informatics learning (12%).

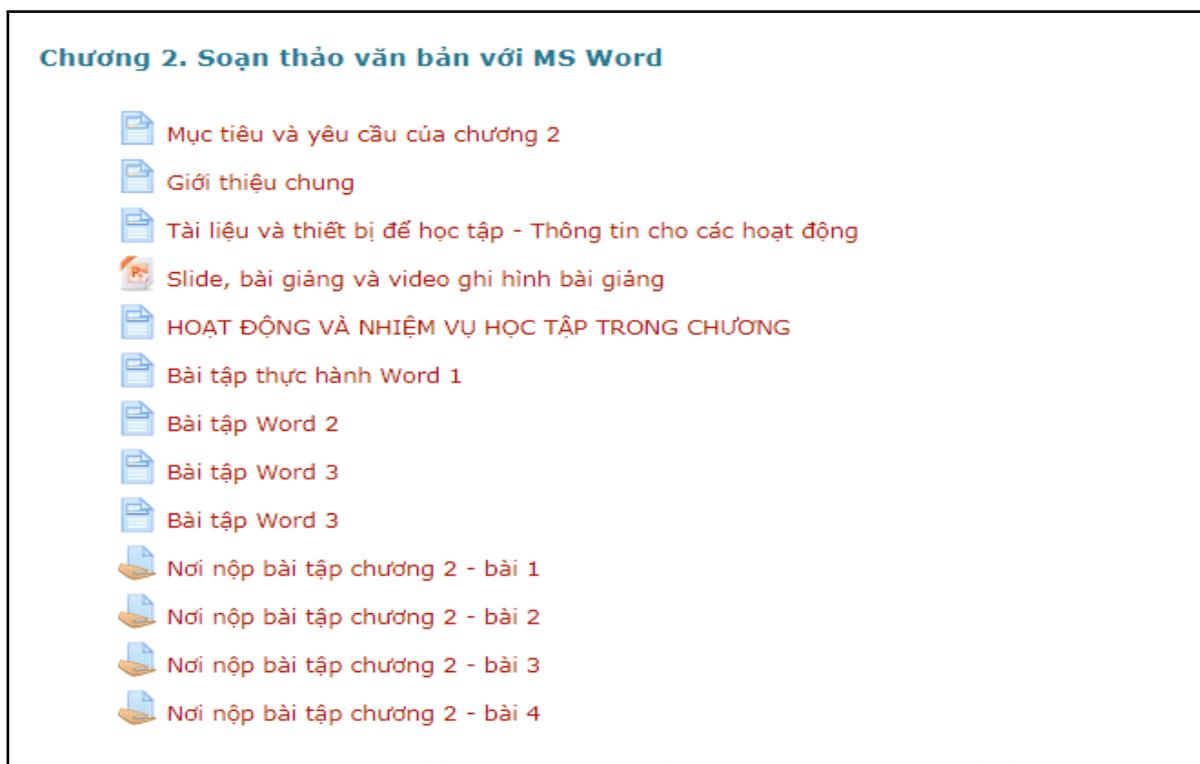
Generally, all aspects asked the students about B-learning were recognized as good by

students, even though their opinion about the importance of learning GI subject was still low.



The screenshot shows a course page with a breadcrumb trail: Trang đầu > BÀI GIẢNG > TIN HỌC > ĐHSP HUẾ > TIN_SP_HUE_01. The main title is 'Tin học đại cương - Thầy N.T.Dũng - 2017-2018'. Below the title, there are several icons and text links: 'Diễn đàn tin tức', 'Phòng chat - nơi các nhóm thảo luận', 'Mục tiêu môn học', and 'Tóm tắt nội dung môn học'. A section titled 'Tài liệu tham khảo chính:' lists a book by Hà Việt Hải, Nguyễn Thế Dũng, Nguyễn Lan Anh, and Võ Hồ Thu Sang (2017), published by NXB Đại học Huế. Below this, it says 'Sách có bán tại phòng KHCN - ĐHSP Huế.' There are also icons for 'Đề cương chi tiết', 'Tiến trình dạy - học và quy định kiểm tra đánh giá môn học', 'Nơi nộp bài tập thực hành', and 'Kiểm tra đầu vào'.

Figure 1. The content of General Informatics course



The screenshot shows a chapter page titled 'Chương 2. Soạn thảo văn bản với MS Word'. It contains a list of items with icons: 'Mục tiêu và yêu cầu của chương 2', 'Giới thiệu chung', 'Tài liệu và thiết bị để học tập - Thông tin cho các hoạt động', 'Slide, bài giảng và video ghi hình bài giảng', 'HOẠT ĐỘNG VÀ NHIỆM VỤ HỌC TẬP TRONG CHƯƠNG', 'Bài tập thực hành Word 1', 'Bài tập Word 2', 'Bài tập Word 3', 'Bài tập Word 3', 'Nơi nộp bài tập chương 2 - bài 1', 'Nơi nộp bài tập chương 2 - bài 2', 'Nơi nộp bài tập chương 2 - bài 3', and 'Nơi nộp bài tập chương 2 - bài 4'.

Figure 2. The chapter building and organization of the General Informatics course

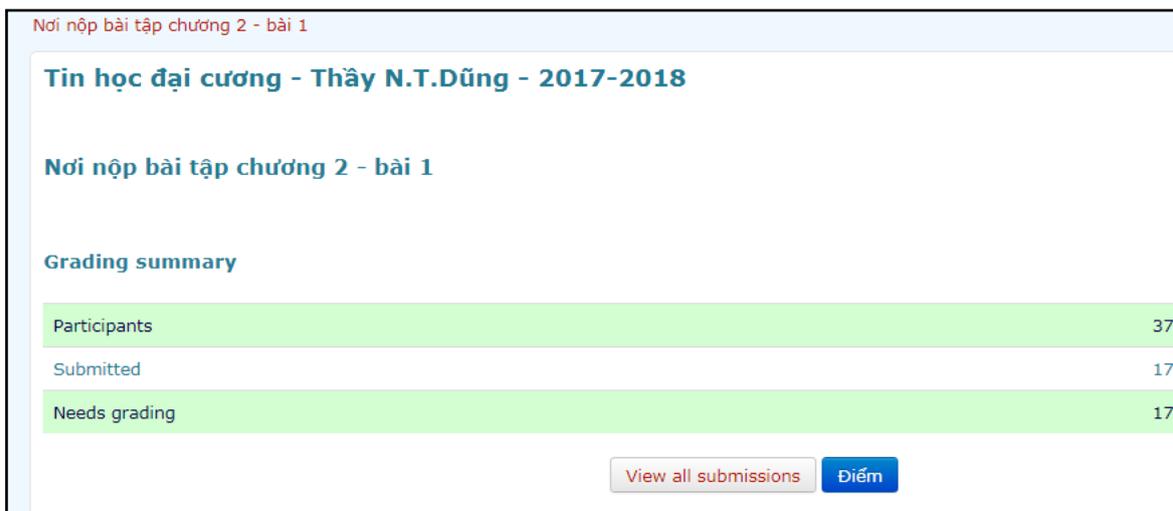


Figure 3. The General Informatics test and evaluation

Table 1. The questionnaire on the efficiency of GI teaching by utilizing the B-learning approach

No.	Question	SD	D	UK	A	SA
1	The course and content					
1.1.	I do not have any trouble in accessing the website					
1.2.	The structure of the course helps me to understand my goals and it is easy to learn					
1.3.	The lessons are designed to be highly interactive					
1.4.	The course website ensures the safety and confidentiality of the information served					
1.5.	The course website is completely reliable					
1.6.	The course materials are diverse, rich and effective					
1.7.	The course materials are close to reality, creating excitement for learners					
1.8.	The information provided in the course is useful for developing students' ICT skills					
1.9.	The course content has helped the students to develop their basic ICT skills					
1.10.	The course contents are well-complemented to the official informatics curriculum used (Informatics curriculum - Hue University of Education)					
1.11.	The course contents equip the students with adequate knowledge and skills to complete their final exam					
1.12.	The course contents are in line with the objective set out i.e. helping the learners to achieve the general informatics framework for non-specialized students					
2	Organization and participation in the course					
2.1.	I was actively involved in the course					
2.2.	I was proactive in the learning process					
2.3.	I spent more time in online learning					
3	The impact of the course					
3.1.	The course has helped students to improve their online learning skills					
3.2.	The course has helped students to improve their computer skills					
3.3.	The course has helped students to gain more interest in studying Informatics					
3.4.	E-learning was the good tool for learning basic informatics for students					
3.5.	The course helped students familiarize themselves with and understand more about the students' general informatics framework					

No.	Question	SD	D	UK	A	SA
1	The course and content					
3.6.	The course has expanded the opportunity for students to learn about Informatics					
3.7.	The course has helped to raise the students' awareness about the importance of learning Informatics					
3.8.	The course provided opportunities for students to practice basic and necessary ICT skills					
3.9.	The course has helped the students to achieve certain levels of ICT					
3.10.	I like learning by using the B-learning model					
3.11.	The materials provided by the teacher helped me complete the practical exercises					
3.12.	Working on the E-learning site is easy					
3.13.	By using B-learning model, I learned Informatics more effective through hands-on activities and exercises					
3.14.	Through this course, I learned a new learning model i.e. B-learning					
3.15.	My ICT skills have been improved as the result of the B-learning model implementation in this course					
3.16.	I felt interested to learn the entire materials of this course					
3.17.	I want to learn more about ICT after this course					
3.18.	I like to learn by using B-learning model					
3.19.	I will introduce this learning model to my friends					
4.	Collaborative learning					
4.1.	I was excited about the group discussions on Facebook					
4.2.	I learned a lot from my classmate's comments					
4.3.	I have had various interactions with my classmates through B-learning model					
4.4.	I found a new way of interactive learning by using ICT					

The course design

Of the 61 students enrolled in the survey, including some students outside the experimental group, there was a similar B-learning model or participation in the collaborative learning activities of the experimental group. Most of the students thought that the lessons were designed to be

The results of the course survey and course content were consistent with the results of the study by Kham et al. (2016) and Hung and Thanh (2016) which stated that an assertive online learning and ICT-supported learning modes, has brought in students' academic success. The academic achievement reached also could in form of reducing drop out rate and improved-exam-mark (López-Pérez, Pérez-López, & Rodríguez-Ariza, 2011). This approach has been proven to give meaningful learning experiences for students in more effective and efficient way (Garrison & Kanuka, 2004).

Students' practical and online learning skills

Based on the survey results, students felt that their practical and online learning skills have been improved by experiencing B-learning. The rating gained as high as 87% for

interactive, content-rich and effective (79%). Many students showed interest in the links to video lectures on MS Word and MS Excel. The content of the course helps students develop basic ICT skills. This in line with Kho et al. (2018) who have revealed that B-learning implementation has improved students' knowledge as well as their practical skills. practical skill and 79% for online learning skill. As assessment during the learning process, the students getting more and more confident in using a computer and utilizing the internet to explore materials they need to support their learning.

Moreno-Ger et al. (2010) concluded that the use of web-based simulation as a media for students has made students felt more comfortable during laboratory session which, in turn, aided them to perform the exercise better as well as to achieve accurate results.

The more the students explore the materials and media served, the more confidence they to express their opinion and asking questions. As the students practice and online learning skills were upgraded, their motivation to participate in discussion room was getting better based on both aspects the quality and quantity. They

having higher analysis in utilizing some application available online.

Student organization and participation in the course

The majority of students surveyed reflected that they neglected and gave less investment in learning with online learning. The reasons were: 1) not regularly access the Internet and/or 2) no personal computer for learning. Some students were less self-motivated to participate in online learning. These results were in line with the other studies (Kham et al., 2016; Vu, 2016) which reported that most of the obstacles encountered by learners were due to they are

accustomed to the traditional learning style. This learning style has three characters: lack of initiative, lack of self-discipline, and lack of effective time management skills (Vinh, 2013). By considering the characteristic of GI, which is a highly practical subject, the students were required to access the course as well as the social networking site and Facebook to exchange and conduct collaborative learning, besides to submit practical exercises. The proper ICT media used allowed students to have the higher level of knowledge building collaboration and interaction (Sun, Liu, Luo, Wu, & Shi, 2017).

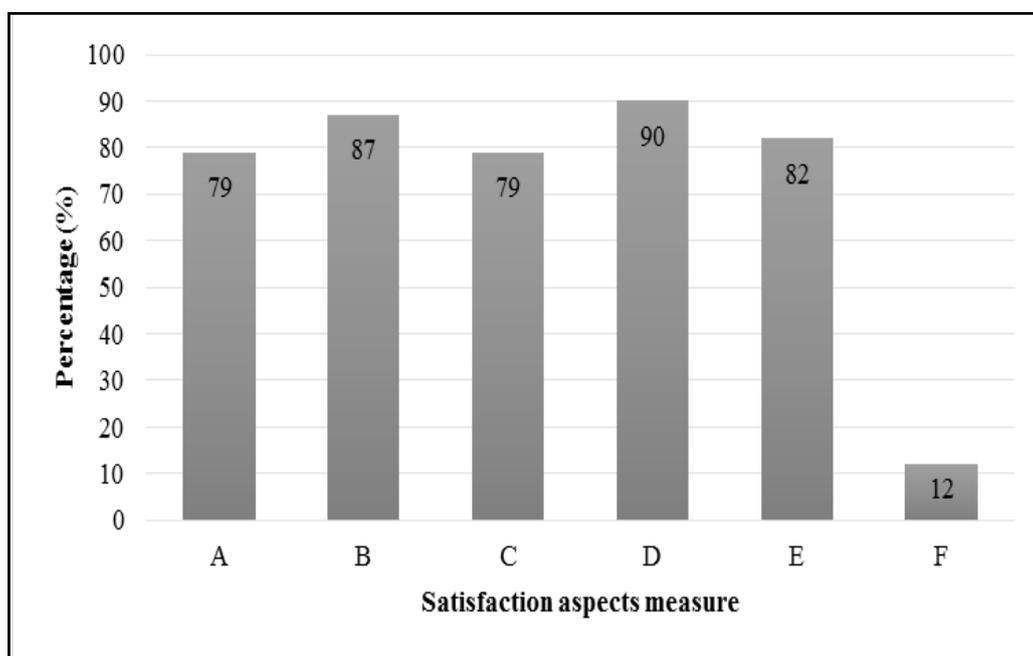


Figure 4. The results of B-learning survey

Description:

- A: The course design (interactive, rich content, effective)
- B: The use of the course in improving students’ informatics practical skill
- C: The use of the course in improving students’ online learning skill
- D: The effectiveness of hands-on exercise effectivities
- E: The frequent of students’ interaction through B-learning
- F: The students’ perception of the importance of Informatics learning

However, survey and interview results showed that self-learning as well as group exchange skills, community communication, computer network usage of the learners have been improved. The results obtained in this study were similar to those of Vinh (Vinh, 2013) who suggested that the advantage of combined learning is to create a learning

environment in which learners take initiative on learning, as well as the results of research on pedagogical characteristics of communication through technology affect learners, by Long (2014). Garner et al. (2016) concluded that a well-managed of face-to-face and online instruction enriches human interaction which creates the relationship among students.

The impact of the course and collaborative learning

The study results showed that the majority of students gave a good response to the different aspects related to the impact of the course. As many as 87% of respondents agreed that the course contributed to improving their Informatics practice and suggested that B-learning provided good support for their study in General Informatics subjects. In particular, over 90% of students said that they have learned more effectively through hands-on exercises without the hassle in elaborating academic theories.

Most of the students also thought that their ICT skills have improved as a result of the course and the learning model (B-learning). As the good perception has been built among students, the improvement of their learning results will be enacted. This due to the strong positive influence of perception on cognitive aspect and emotional engagement (Manwaring et al., 2017).

The survey results on collaborative learning through B-learning models such as the interaction between the learner and the learning environment through the impact of ICT, learning through peer feedback, group discussions were also positive (82%). The student perception of collaborative learning was proven positively related to social presence and satisfaction perception (So & Brush, 2008).

The effectiveness of B-learning can be indicated by the previous indicators which were rated more than 70% by students.

By considering the all good results above, there still one aspect to have low results i.e. the students' perception of the importance of learning GI subject, in which the rating was only 12%. This is assumed that the students were not students who take IT (Information and Technology) as their major subject or they are not habituated yet to the use of internet information to solve issues in their daily life, thus, they were underestimating in GI subject or another issue related to unexpected workload that leads to night work or family issues (Vanslambrouck, Zhu, Lombaerts, Philipsen, & Tondeur, 2017).

Therefore, the lecturer, as well as the institution, should provide a valid information about their students before starting the program. In addition, the students' motivation needs to be

strengthened to learn GI as the government set the standards to need to fulfilled by students.

CONCLUSION

The article proposes and tests the teaching process for the GI course on the B-learning model. The combination of B-learning between face-to-face and e-learning was 60 %: 40%. This model was effective based on some indicator achievements: (1) the course design has been recognized by students as interactive, rich of content, and effective in which the rate reached was 78%; (2) the students' informatics practical skill has been improved (87%); (3) the students' online learning skill has been improved as well; (4) the hands-on exercise has been effective; (5) the students' interaction through B-learning was good (82). However, a good perception of the important matter of learning GI still low (12%).

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