

# RELATIONSHIP BETWEEN ICT ADOPTION AND TRAINING WITH STUDENT PERCEPTIONS OF VIRTUAL CLASS SERVICE QUALITY

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## ABSTRACT

The rate of internet adoption and training did not show the pattern of relations with the user's behavior but the website shows the pattern of relationships with quality perception. Adopter groups indicated usability, information quality and services interaction, higher compared with non-adopter group. Thus, students who adopt the use of information technology and computers and have experience of training has a significant relationship to the perception of service quality virtual class.

## KEYWORDS

Virtual Class, ICT Adoption, Webqual

## 1. INTRODUCTION

E-Learning is a concept derived from the use of information and communication technologies (ICTs) to revise and transform traditional teaching and learning models and practices has evolved in the past decade. This evolution has resulted from the emergence of the information society and has greatly impacted on the global economic and socio-cultural development. However, researchers in the field still argue that the development of e-Learning has not been tested by time and is still in its infancy. This has resulted into continued research in the e-Learning field generating numerous implementation strategies a scope that requires identifying and understanding (Kahiigi, E. K. et al, 2008).

E-Learning may be defined as instruction delivered electronically via the internet, intranets, or multimedia plat-forms such as CD-ROM or DVD. Since many users today have access to direct internet connections, e-learning is often identified with web-based learning. e-Learning can be implemented in a variety of ways, such as through the use of self-paced independent study units, asynchronous interactive sessions (where participants interact at different times) or synchronous interactive settings (where learners meet in real time) (Smart and Cappel, 2006).

There are gaps in university education which some universities have taken advantage of elearning usage, otherwise there are ICT non adaptor in the process of teaching and learning. An effort to improve universities ICT adaptor in Indonesia, the Indonesian government in this case the Ministry of National Education has been providing various funding schemes and facilities, such as the development of Indonesian Higher Education Network (INHERENT), the Global Development Learning Network (GDLN), and several grants to develop teaching materials (teaching grant). Development of facilities and funding webcontent focused on e-learning, virtual classroom, a repository of paper, and various types of application of ICT in teaching and learning. All these facilities are provided to improve the quality of teaching in Indonesia.

Virtual class is one of the ICT facilities that have been developed. This facility was developed by adopting a conventional learning in the classroom. There are many factors that affect the performance of this online learning, such as perceptions of student and teacher on this service.

Therefore, the aims of this research is to measure student perceptions of virtual service quality. The research questions is whether levels of ICT adoption and training experience influence the intensity of use of the internet and virtual class among the students at one university in Indonesia. Internet experience includes computer training and internet training, while ICT adoption includes ownership of personal computer and personal website. Levels of ICT adoption variables used in this research are categorized as adopters and non adopters.

## 2. THEORITICAL FRAMEWORK

### 2.1. e-Learning

There are many terms for online education, some of them are: virtual education, Internet-based education, web-based education, and education via computer-mediated communication (Keegan D, 1988). Hence, online education is characterized by The separation of teachers and learners which distinguishes it from face-to-face education; the influence of an educational organization which distinguishes it from self-study and private tutoring; the use of a computer network to present or distribute some educational content; and the provision of two-way communication via a computer network so that students may benefit from communication with each other, teachers and staff.

One of the implementation of online education is e-learning. Definition of e-Learning based on the glossary of [elearningeuropa.info](http://elearningeuropa.info) is the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration.

Clark, Ruth, 2002, define e-learning as interactive learning in which the learning content is available online and provides automatic feedback to the student's learning activities. Online communication with real people may or may not be included, but the focus of e-learning is usually more on the learning content than on communication between learners and tutors.

Decisions about e-Learning courseware must begin with an understanding of how the mind works during learning and of what research data tell us about what factors lead to learning. This is where decisions must begin. Naturally factors other than psychological effectiveness come into play in your multimedia learning decisions. For example, instructional strategies will be shaped by parameters of the technology like bandwidth and hardware, and by environmental factors such as budget, time, and organizational culture. e-Learning is content and instructional methods delivered on a computer (whether on CDROM, the Internet, or an intranet), and designed to build knowledge and skills related to individual or organizational goals (Clark, Ruth, 2002).

There is a distinction among three important elements of e-Learning courseware: *the instructional methods*, *the instructional media*, and *media elements*. Each new wave of technology has stimulated prospects of revolutions in learning. In Clark research's result, comparing learning from one medium such as the classroom with another medium such as the Internet generally fails to demonstrate significant advantages for any particular technology. According to Clark's opinion, this can cause repeated errors and lead to abandon a technology-centered approach to learning in favor of a learner-centered approach. Having participated in many poor training sessions in the classroom and on the computer, She recognize that it's not the medium that causes learning. Rather it is the design of the lesson itself and the best use of instructional methods that make the difference. A learner-centered approach suggests that we design lessons that accommodate human learning processes regardless of the media involved.

*Instructional methods* are the techniques used to help learners process new information in ways that lead to learning. Instructional methods include the use of techniques such as examples, practice exercises, simulations, and analogies. For each new technology that appears on the scene, we typically start by treating it like older media with which we are familiar. For example, much early Web-based training looked a lot like books — mostly using text on a screen to communicate content. As the technology behind a given medium matures, we get better at exploiting the features unique to that medium for learning. A third component of multimedia learning is *the media elements*. The media elements refer to the text, graphics, and audio used to present content and instructional methods. The media elements include a graphic of the screen and (during the demonstration) audio narration that explains the steps seen in the animation.

### 2.2. Web Service Quality

There is currently a profusioan of scale that measure perceptions of electronic ser vice quality, that are *EtailQ*, *Webqual 4* and *Sitequal*. *EtailQ*, developed by Wolfenbarger & Gilly (2003). This scale includes 14 items divided into 4 dimensions (design, customer service, reliability/compliance with commitments and security/privacy).

*Webqual 4* developed by Barnes & Vidgen (2003), composed of 22 items on 3 dimensions (quality of information, quality of interactivity /confidence and empathy, and usability of the site / usability and design). Webqual is an instrument for assessing the usability, information, and service interaction quality of Internet web-sites, particularly those offering e-commerce facilities. The WebQual instrument is being developed by the Management Schools at the University of Bath and the University of East Anglia by Stuart Barnes and Richard Vidgen. Webqual 4, composed of 22 items on 3 dimensions (quality of information, quality of

interactivity/confidence and empathy, and usability of the site / usability and design. *Information quality* from mainstream IS research. A core part of the Webqual instrument, from version 1.0, was the quality of online information. The questions developed in this segment of Webqual build on literature focused on information, data and system quality. WebQual is applied in the domain of Internet auctions and the results used to assess the reliability of the instrument for assessing the quality of web sites.

*Sitequal* developed by Yoo & Donthu (2001), including 9 items distributed over 4 dimensions (ease of use, design, processing speed and security). The research about the superiority of sitequal was done by Bressolles Gregory and Jacques Nantel. Their research comparing three principal scales: Sitequal, webqual 4 and EtailQ that developed in the academic world. They distributed 204 questionnaires online to client of two Canadian commercial websites (travel agency and online insurance). Their research concluded sitequal is superior to the two other scale considered (Webqual 4 and etailQ) in predicting the perception of electronic service quality and offers the best strongest predictive power. Nonetheless, to validate their results, it should be replicated for other categories of sites, and it is worth verifying whether the category of sites (products, services, information, etc) plays a role in evaluating perceptions of electronic service quality. Nevertheless the Sitequal fails to provide a reliable and global image of the complexity of electronic service quality.

### 3. METHODOLOGY

This research method consists of 3 steps. The first step is the creation of research instruments, the second step is data collection and the third step is the testing and analysis. The first step of the research objective is to create a research instrument to produce an instrument that can be used to measure student perceptions of the quality of web-based virtual class service. This phase begins with the design of the instrument by adopting techniques from Barnes and Vidgen Webqual (2003). The instrument consists of 22 question items that are divided into 3-dimensional measurement of usability, information quality and service interaction. In the usability dimension consists of 6 question items, information quality 5 question items and services interaction 11 question items. Services interaction item has more questions than any other dimension because the virtual class has a lot of interaction. The third dimension of measurement is also equipped with variable intensity of internet usage and behavior of internet usage among college students. Webqual dimensional assessment and these additional variables using seven scale licert. Besides the variables mentioned above, the instrument is equipped with student demographic variables and students' level of ICT adoption. Level of ICT adoption variables used in previous studies, are mostly categorical, i.e. adopter and non adopter. In some publications, partial adopter and full adopter are used for these terms.

The next step is data collection. Data collected by survey method. Samples are a college student who uses virtual class facilities. Respondents were taken with the judgment sampling so that it can represent ownership of a personal computer, blogs or personal website, computer training and internet training experience. The last step is testing and results analysis, it was conducted to examine the reliability and validity of research instruments, analyze the dominant factor influencing the behavior of internet usage, student perception of virtual class usage. Instrument test conducted by Seven Likert Scale and measuring the ratio of each dimension using Cronbach's Alpha coefficient, while validity is measured by factor analysis with Principal Component Analysis method, which is equipped with a Kaiser-Mayer-Olkin (KMO) and Bartlett. Based on test reliability, Cronbach's alpha coefficient showed 0.75 usability, 0.70 information quality and 0.84 services information. The test of validity, show that KMO value / Kaiser-Mayer-Olkin 0.72 usability, 0.75 information quality and 0.91 services interaction. To analyze the relationship pattern between ICT adoption and training with quality perception, the significance test using Chi-square test and the Wilks Lambda. The relationship between levels of ICT adoption by virtual class service quality perception is analyzed using the General Linear Model.

### 4. RESULT AND DISCUSSION

#### 4.1. ICT Adoption, Training and Internet Usage Behavior

This research involved 221 respondents that consist of 161 students (72.9%) from IT departments and 60 students (2.7.1%) from non-IT departments. All respondents are using HP, internet services and virtual class services. Composition of respondents consisted of 91.4% of the students own personal computers and 78.3% own a blog or personal website. According to training experience, 53.4% have computer training experience and 30.3% had internet experience training. Results showed that students who have computer training experience, most of them adopt ICT, which is 55.9% have personal computers and 57.2% had a blog or personal

website. According to internet training experience, few of them adopt ICT, there is 30.3% have personal computers and 32.9% have a blog/personal website. This situation illustrates that all students who have a blog or personal website also has a personal computer. Most students need computer training but do not need internet training. Students who have experience of computer training has a tendency to adopt ICT. Most students use the internet from cyber café as much as 88.7%, 75.6% on campus, 60.2% on home and 59.7% on mobile. Students who use the internet almost everyday there is 31.7%, 29.9% everyday, 8.6% once in a week, 7.2% several days in a week, 0.9% a month once and 0.9% less than in a month. Students utilize the internet for various purposes as shown in the figure 2 below

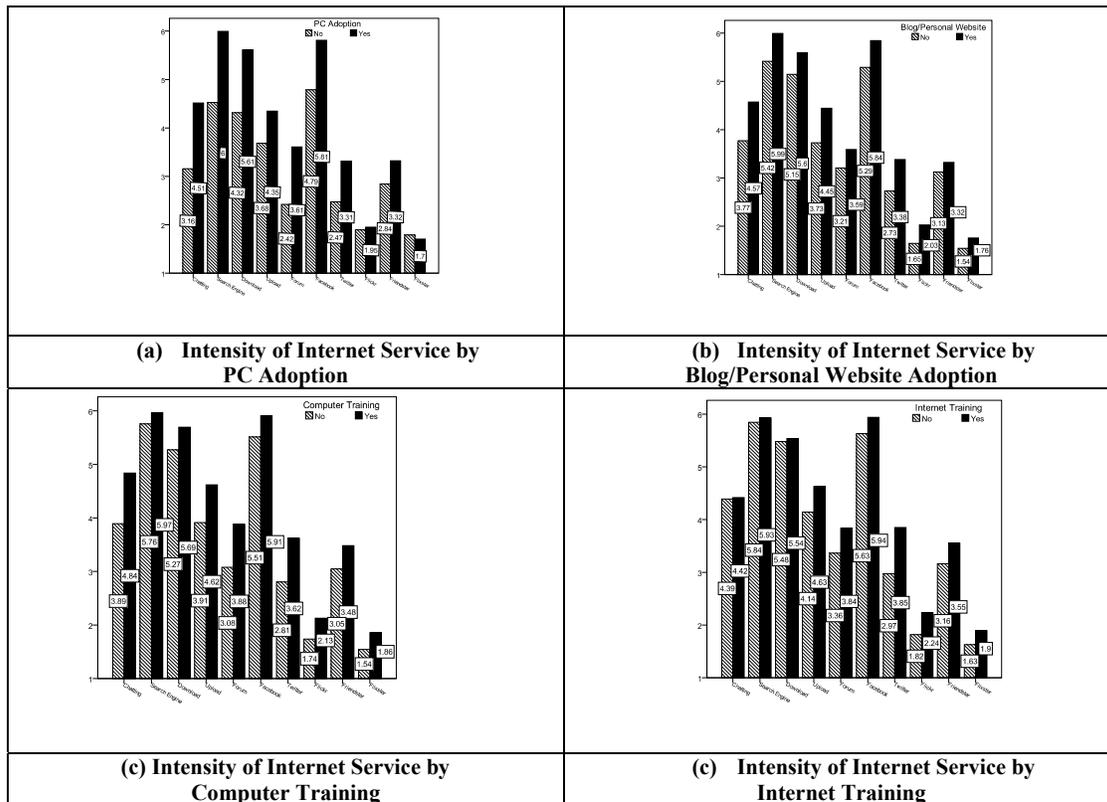


Figure 1 Intensity of Internet Service

Based on the figure 1 above, the results showed that students mostly use for browsing the internet, facebook, download, upload, chat and others. Students more often utilize the internet for browsing, facebook and downloads. While students rarely use the internet for sharing photos and movies are shown at least the intensity of flickr and flixter. Based on intensity of internet utilization, Figures 1 (a) shows that students who have a personal computer utilize browsing, downloading and facebook oftenly; uploading and chat quite often utilized; discussion forums, twitter and mspace is rarely used, while the rarely used is flickr and flixter. Based on intensity of internet utilization, figure 1 (b) indicates that students who have blogs or personal websites utilize browsing, downloading and facebook oftenly; chat and upload quite often; forums, twitter and mspace is rarely used, while the rarely used is flickr and flixter.

Ownership of personal computer and personal website is one factor driving the intensity of internet utilization among college students. This finding is not surprising and in line with the theory or the results of previous studies. Internet usage requires access to facilities and connections through personal computer as one of the early stage in the process of internet adoption. The students do not use ICT as a learning tool, they want are not well-skilled in ICT and get anxious by the use of computers, they want assume That will from both faculty and students fail to meet the requirements of e-learning (Vrana et. al.). According to Hamid and Khatibi (2006), who are users more familiar with a technology tend to have more knowledge of technology standards earnings currently available in the market.

Students who have computer training experience, using the internet browsing, facebook and download frequently; chat and upload quite often; forums, mspace and twitter is rarely used, while the rarely used is flickr and flixter. Based on internet training experience, figure 1 (d) indicates that students who had internet training experience, use facebook, browsing and downloading are oftenly; uploading and chat quite often

utilized; twitter, forums and myspace is rarely used, while the rarely used is flickr and flixter. Thus, the conditions above illustrates that ICT adoption and training experience does not affect the behavior of internet usage among students.

### 4.2. ICT Adoption, Training and Virtual Class Usage Behavior

In general, the students utilize virtual class more lower intensity than the internet public services. Virtual class is only used to conduct lectures doing the tasks and quiz, getting online learning materials, discussion, reading the announcements and others. There are some differences of virtual class features intensity. The results showed that the feature assignments, quiz, online material and download the materials quite often utilized as compared with other features. This shows that students in a lecture or learning process requires the material to be studied and the assignment or quiz that serves to determine the extent to which mastery of the material, while the discussion is rare in virtual class lecture. Figure 3 below shows the results of research

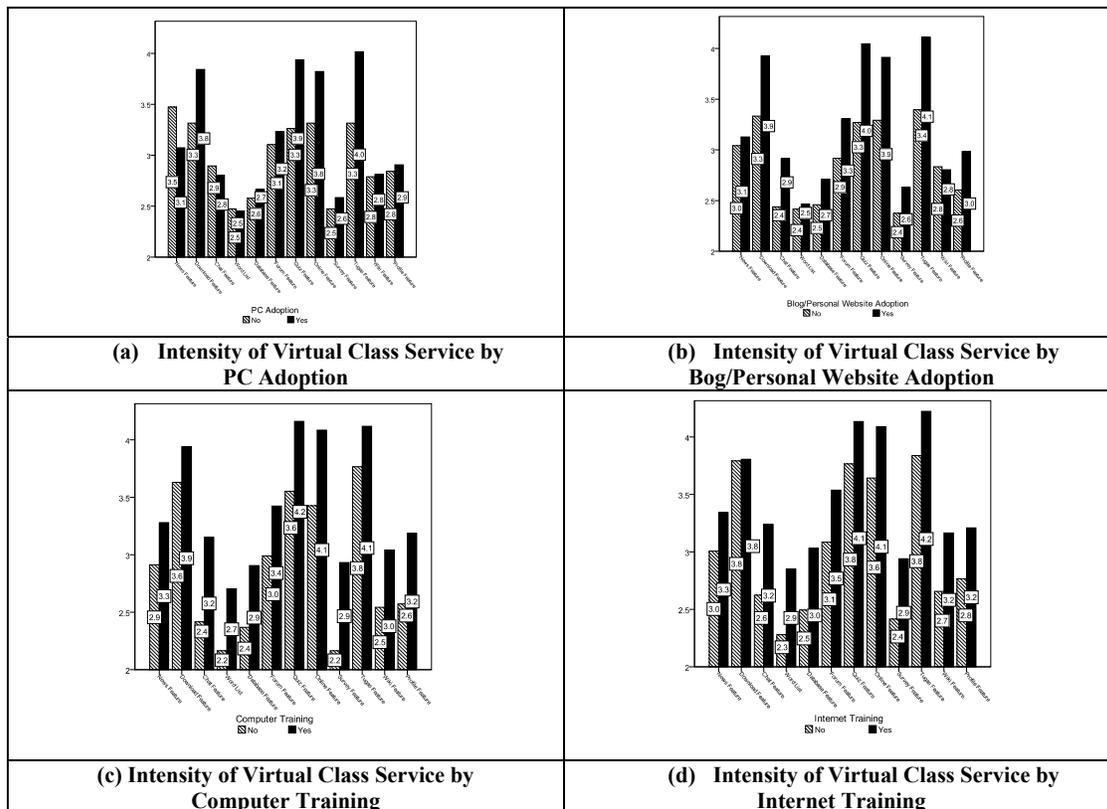


Figure 2 Intensity of Virtual Class Service

The intensity of utilization of virtual class features can be showed in the figure 2. Figure 2 (a) shows that students who have a personal computer have more higher intensity than students do not have personal computer. Assignments, quiz, online material and download feature are frequently accessed ; word list, survey and databases are rarely accessed, and the other features such as news, chat, discussion forums, wikis and profiles are moderate accessed. Based on intensity of virtual class features utilization, figures 2 (b) indicates that students who have blogs or personal websites accessed features such as assignment, quiz, online material and download frequently; word list, surveys and databases are rarely accessed; and the other features such as news, chat, discussion forums, wikis, profiles browsing, downloading features are moderate accessed.

The figures 2 (c) indicates that students who have computer training experience access assignments, quiz, online material and download feature frequently; word list, surveys and databases feature are rarely accessed; and the other features such as news, chat, discussion forums, wikis and profile browsing and downloading features are moderate accessed. Based on internet training experience, figures 3 (d) indicates that students who had internet training experience access feature such as assignments, quiz, online material and download frequently; word list, surveys and databases features are rarely accessed; and the other feature such as news, chat, discussion forums, wikis, profiles browsing and download features are moderate accessed. Thus, this condition shows that ICT adoption and use of the training does not affect the behavior of virtual class usage

because all students have the same needs that is material to be studied, quiz or assignment to measure the ability of understanding the material.

### 4.3. Website Quality Perception Analysis

In general, respondents who considered ICT adopters have more higher quality perception than non-adopter respondents. The general pattern is in accordance with the framework or the previous preliminary study on models of information technology acceptance. The general pattern was shown the results of research as illustrated figure 3 below. Figures 3 (a) and (b) indicates that respondents who have a personal computer or have a blog/personal website has a higher quality perception than respondents who do not have a personal computer or a blog/personal website. This shows that have increased availability of computer tools that can be used at any time adopter need it cause when respondents have a perception of higher quality than non-adopter respondents. These factors can cause the intensity of utilization can be increased so that the good operation of computer hardware devices to software is becoming easier. Adapting easily cause more higher rating usability than information quality and services interaction as seen in the figure 3 (a).

The habit factor of blog/personal website content management cause blog/personal website adopters had knowledge of the quality of the content. This causes the assessment information quality more higher than usability and services interaction.

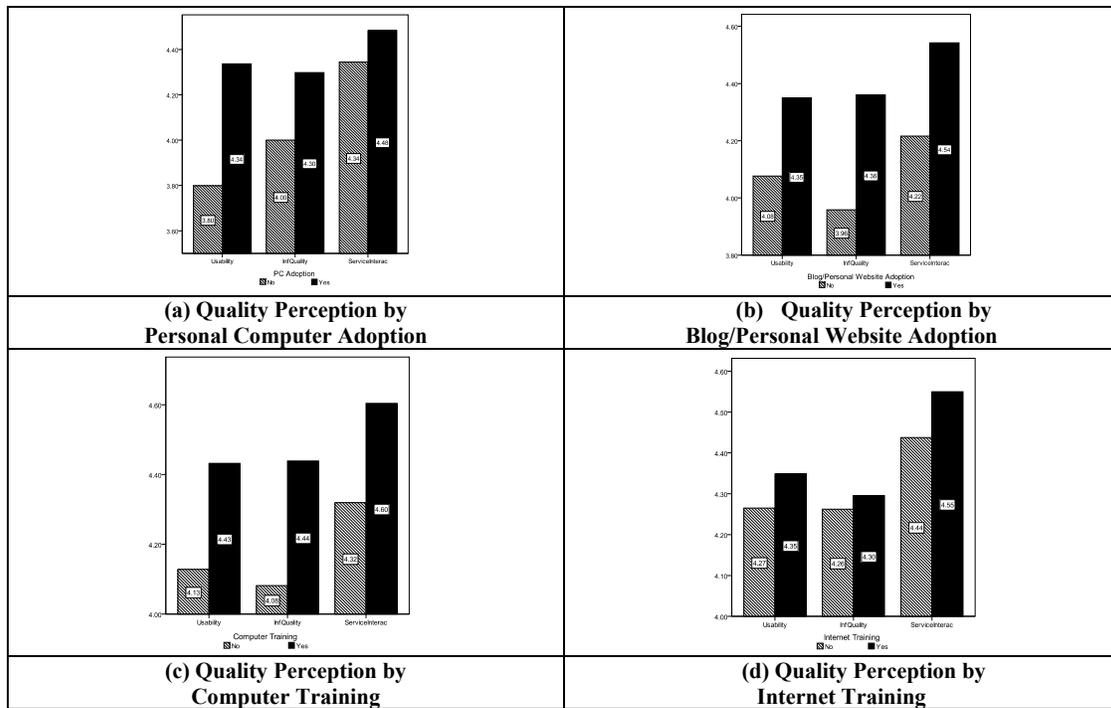


Figure 3 Quality Perception

Figures 3 (c) and (d) indicates that respondents who have computer training experience or internet training experience has more higher quality perception than the respondents who have no training experience. This shows that having a basic knowledge of computers and internet devices cause adopter respondents have higher quality perception than non-adopter respondents. Having knowledge of computer environment causes the respondents have more higher perception of information quality than usability and services interaction as seen in the figure 3 (c). Having knowledge of internet environment causes the respondents have more higher perception services interaction than usability and information quality as shown in the figure 3 (d). There is an interesting thing, having internet training experience causes more lower effect than the other adopters.

It is because of all respondents are internet users, so the effect is not as much difference in other types of adopters. The analytical results of investigation indicate a relationship between user perceptions of the characteristics of web learning and their intention to use the technology. When individuals have more experience with e-learning, the impact of perceived innovation characteristics on intentions to use web learning are different from that of inexperienced learners (Lu, 2005).

## 5. CONCLUSION

The results generally show that one of the driving factors in the utilization of the internet and virtual class among the students are training experience, especially internet training. Students who have experience of computer and internet training tended to show higher intensity of the internet and virtual class utilization. This training experience also determine the level of student perceptions of the virtual-class services quality. Students who attended the training tended to show more higher rating compared with students who have never followed training. The intensity of virtual class utilization and virtual class services quality perceptions are also different views of the level of ICT adoption, which includes ownership of personal computer and personal website.

There are several implications of the results of this research. First, previous experience of internet utilization affects student perceptions of virtual class services quality. These conditions require socialization and training to students earlier about the utilization of internet and virtual class in the teaching-learning process in the university. Training activities mainly focused on students who do not have a personal computer and do not have internet access outside the campus. Secondly, the usage of virtual class features still show variations, which are still concentrated in lectures, online exercises, discussion forums and assignments. Utilization of these features is dependent activity of lecturers as content provider in the application of virtual class in the teaching-learning process. Thus, optimizing the utilization of the virtual class features required in the role of lecturers in utilizing all the features available in virtual classes. Finally, the impact of utilization on the performance of virtual-class students still require further research, especially regarding the influence of the level of ICT adoption and internet utilization behavior to academic performance

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