

# WEB SERVICES QUALITY PERCEPTION OF STUDENT DIGITAL LOCKER BASED-ON DEMOGRAPHY AND INTERNET BEHAVIOR OF UNIVERSITY STUDENTS

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## ABSTRACT

Student who own a computer experiences more benefit of using student digital locker than student who does not own a computer. Discriminant analysis results showed that 4 variables can be used as predictors of personal computer adoption rate among the students, but the highest differentiation factor is significant only for the variable usability.

## KEYWORDS

*student digital locker*, webqual, ICT Adoption, internet behavior.

## 1. INTRODUCTION

The development of information technology today is very fast, this is because the needs of every person to obtain some information is very high. Everyone wants to obtain the necessary information accurately and quickly. The need for very high information encourages principals to apply technology to the development of technology into a tool that can be accessed by anyone to obtain any information needed, so that the information obtained has more value than before. Actually, in the daily life of each person had used various media to obtain information such as electronic media and print media. However, both media have their limitations. This is where the role of principals is absolutely necessary technology. Currently, the development of computer technologies like the Internet is very promising. Role of the Internet can be maximized to obtain the right information and accurate. Limitations of distance and time will be reduced with this technology. This is because each person can use the internet without spending big money.

Concerns over educational relevance and quality coexist with the imperative of expanding educational opportunities to those made most vulnerable by globalization—developing countries in general; low-income groups, girls and women, and low-skilled workers in particular. Global changes also put pressure on all groups to constantly acquire and apply new skills. The International Labour Organization defines the requirements for education and training in the new global economy simply as “Basic Education for All”, “Core Work Skills for All” and “Lifelong Learning for All”. (ILO : Learning and Training for Work in the Knowledge Society, 2002)

Information and communication technologies (ICTs)—which include radio and television, as well as newer digital technologies such as computers and the Internet—have been touted as potentially powerful enabling tools for educational change and reform. When used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality by, among others, helping make teaching and learning into an engaging, active process connected to real life. However, the experience of introducing different ICTs in the classroom and other educational settings all over the world over the past several decades suggests that the full realization of the potential educational benefits of ICTs is not automatic. The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology—indeed, given enough initial capital, getting the technology is the easiest part!—but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing, among others.

Referring to the Ministry of National Education, the number of universities in Indonesia is as much 3102 college (<http://evaluasi.or.id>) consisting of 166 public university and 2936 private university. Indonesian government through the Ministry of National Education has provided a variety of funding schemes and facilities to enhance the application of ICT in universities in Indonesia. Some of these facilities include the development of Indonesia Higher Education Network (INHERENT), the Global Development Learning Network (GDLN), and several grants developing teaching materials (teaching grant). Facilities and funding are emphasized on web

content development, such as e-learning, virtual classes, paper repository, and various types of application of ICT in teaching and learning process.

Various web-based service aims to improve the quality of learning process in Indonesia. One challenge is whether the facility is also useful from the perspective of students as one beneficiary of the teaching-learning process based on the Internet. This study aims to measure student perceptions of service quality of Internet-based learning process. Colleges that used case study is a private university incorporated in the INHERENT and often get government funding for the development of e-learning and other academic information service based Internet. One type of web-based academic information services at the university is a Student Digital Locker. Student Digital Locker is a web-based services designed for University's students which includes features such as email, news, lecturer's message, academic transcripts, class schedules, exam schedules, library administration, web presence, competition and seminar registration, as well as articles publishing. This research is intended to measure the utilization as well as factors that influence the utilization of student digital locker in university students. The method used to measure the abovementioned parameters is the WebQual, which consists of three perception variables, namely usability, information quality, and services interaction.

## 2. THEORITICAL FRAMEWORK

### 2.1. ICT and Education

ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.”(Blurton, C:20020) These technologies include computers, the Internet, broad-casting technologies (radio and television), and telephony. In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings. But ICTs are more than just these technologies; older technologies such as the telephone, radio and television, although now given less attention, have a longer and richer history as instructional tools (Cuban, L. :1986). For instance, radio and television have for over forty years been used for open and distance learning, although print remains the cheapest, most accessible and therefore most dominant delivery mechanism in both developed and developing countries. The use of computers and the Internet is still in its infancy in developing countries, if these are used at all, due to limited infrastructure and the attendant high costs of access.

According to Thornburg, David (2000) ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus.. One defining feature of ICTs is their ability to transcend time and space. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. ICT-based educational delivery (e.g., educational programming broadcast over radio or television) also dispenses with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs, such as teleconferencing technologies, enable instruction to be received simultaneously by multiple, geo- graphically dispersed learners (i.e., synchronous learning).

Thornburg, David (2000) Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (and available in limited quantities) for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at anytime of the day and by an unlimited number of people. This is particularly significant for many schools in developing countries, and even some in developed countries, that have limited and outdated library resources. ICTs also facilitate access to resource persons—mentors, experts, researchers, professionals, business leaders, and peers—all over the world..

As mentioned by Harina Yuhetty, Indonesia as a third world country has a great concern over this deficiency and believe that the digital divide should be reduced so that there will be an economic recovery. The Indonesian government is determined to utilize the information technology effectively to support efforts to increase the national competitiveness. This aspiration is reflected in the Indonesian to improve the quality of human resources, the government had used ICT to expand the educational opportunity, to improve the quality and relevance of education, and to increase the efficiency of the educational system.

Implementation of ICT in higher education learning environments is a complex task. Teachers and students, but also management, administration and ICT support are affected by and affect the implementation. To facilitate the change processes better the first step is to actually understand what problems and challenges implementation of ICT

leads to and how it affects practice. To teachers, the next important aspect of the implementation process has turned out to be the adaptation of the technology for a specific practice. During the adaptation process, teachers also learn to master the technology sufficiently to use it in their courses. In all cases the learning process has reached into teaching processes but started as part of the course preparation. Obviously, the condition for learning to use a technology is that a certain technology has been selected. The teachers have had to learn to use the technologies on more levels. They have had to figure out how to operate it. Depending on previous knowledge and the choice of ICT, the teachers have spent different amounts of time on this process. The teachers using a course management system thus spent more time on learning to operate the technology and adaptation at a technical level than the teachers who had a programmer and author build a web-based course-material. Another level in the learning process is getting to know how to use ICT for a specific course; plan how to change practice and actually changing teaching practice.

## 2.2. Internet Based Teaching and Learning Process

In traditional paradigm, teaching-learning process usually occurs in the classroom and the presence of teacher in front of the classroom is of its major characteristics. They are also responsible for the effectiveness of the teaching-learning process and are perceived as the most important learning resource. In the new paradigm, on the other hand, every student should be facilitated to undertake learning process whenever and wherever she/he needs. In this paradigm the presence of teacher in the classroom is not that important and teacher is no longer perceived as the only learning resource. The implementation of this paradigm will be successful if we utilize ICT or implement e-learning in education.

Indonesia realizes that in regard to improve the quality of its human resource both the problems of access and quality have to be taken into account in finding out their solution. One of the solutions to these problems is by using ICT in education especially related to the application of e-learning in the education system. So far

there is no comprehensive study on the use of e-learning in the entire education system. However, we still can review the extent to which e-learning program has been developed and implemented in the education system.

Ministry of National Education (2003) says that Until this year, various efforts to use ICT in education are among others: *E-learning* is the use of network technologies to create, faster, deliver, and facilitate learning, anytime and anywhere, *Online Courses* is defined as one for which all regularly scheduled classroom time is replaced by required activities completed at distance and managed online, *Online Tutorials* is An online tutorial is a gathering of Web pages designed to help teach you something, *Electronic Library* has a collection of books mostly in the form of digital format and which can be accessed by computer. These different types of libraries by type of library is a collection of conventional printed book, the film micro (microform and microfiche), or a collection of audio cassettes, videos. The contents of the digital library is in a computer server that can be placed locally, or in a remote location, but can be accessed quickly and easily via a computer network, *Computer Assisted Instruction (CAI)*, is an off-line instruction program so it does not depend on access to the internet, there are interactive learning materials which students can learn on his/her own with minimal assistance from the teacher/lecturer.

E-learning is applied in education in three ways, i.e., as a supplement, as a complement, and as a substitute.

1. When teaching-learning process is undertaken in regular classroom and every student is free to decide whether or not he/she would take e-learning program for enrichment this means that the function of e-learning is as a supplement for teaching.
2. When teaching-learning process is undertaken in regular classroom and every student is mandated to take e-learning program to complement it, such as for enrichment, remedial teaching, doing assignment, etc., otherwise it will affect in his/her capability and/or grade this means that the function of e-learning is as a complement for teaching.
3. When the teacher undertakes the teaching-learning process through internet instead of the regular one in a classroom this means the function of e-learning is as a substitute for regular teaching-learning process. The learning material, assignment, assessment, and the result of the assignment can be accessed by the students through internet. This also means that e-learning is treated as a mode of instruction substituting the regular one in which teaching-learning process occurs in a classroom and by direct face-to-face contact between teacher and students.

Student digital locker is a web-based services designed for University's students which includes features such as email, news, lecturer's message, academic transcripts, class schedules, exam schedules, library administration, web presence, competition and seminar registration, as well as articles publishing.

Digital student lockers is a web-based application that is used by college students to access information about news campus, students use electronic mail, class schedules, exam schedules, a summary of the value of college, an electronic certificate, the student portfolio includes assignments, written and electronic registration

competition blog. Student's digital lockers are helping students and university management in providing information and communication.

### 2.3. Web Service Quality

Whereas aspects of traditional service quality (dimensions, related variables, etc.) have been studied extensively over the past two decades, the study of the service quality of websites is a fledgling domain. Zeithaml and *al.*, (2002) defined electronic service quality as "the extent to which a web site facilitates efficient and effective shopping, purchasing, and delivery of products and services". This transactional quality entails the evaluation of the pre - and post - service experience. Based on this definition, we can draw a parallel with traditional service quality to elucidate the similarities and differences between these two concepts.

The most important and probably the most evident difference between traditional service quality and electronic service quality is the replacement of interpersonal interaction with human-machine interaction. This simple distinction raises many questions concerning the type of dimensions that can or must be considered to assess service quality in the e-commerce context. Owing to the specific characteristics of online commerce, direct application of the dimensions of service quality developed in other environments is not appropriate, or at best, does not capture all of the subtleties of the evaluation of service quality of commercial websites. The classic dimensions of traditional service quality are tangible elements, reliability, reactivity, assurance and empathy of the service provider (Parasuraman *et al.*,1988). To date, however, there is no consensus concerning the dimensions of electronic service quality. Although largely anecdotal, dimensions proposed recur fairly systematically security/confidentiality, website design, efficacy, ease of use and the quality of the information contained in the site. Besides, positive feelings expressed for traditional services are not present in the perceptions of electronic service quality. Similarly, negative feelings (anger, irritation, frustration) are apparently less intense on the Internet as when expressed during problems encountered with traditional services. Lastly, if classic evaluations of traditional service quality are based on the calculation of a gap between expectations and perceptions, it is difficult to apply this same model to the measurement of electronic service quality; respondents find it difficult to formulate their expectations concerning electronic service quality. A direct measure of the perceptions of electronic service quality, after the service has been delivered, therefore seems worthwhile.

As in the physical world, there are different ways to measure the quality of a website. Cunliffe (2000) stated that the methods all fall into one of two broad categories: behavioural measures and attitudinal measures. **Behavioural measures** focus on the measurement of the commercial activity of the site: number of clicks, number of unique visitors or conversion rate of new visitors. **Attitudinal measures**: traditional measurement scales that evaluate perceptions of consumers or that rely on professional experts to measure these perceptions. Under this category fall two approaches. The first one, generally based on experts' evaluation or interstitial surveys, seem more common among practitioners. The second one, more grounded in psychometric theory, is more prevalent among scholars. Practitioners have adopted various approaches to measure perceptions of quality or efficacy of commercial websites.

Webqual is one method or technique of measuring the quality of web based end-user perception. This method is the development of SERQUAL (Zeithaml et al. 1990) is widely used previously in measuring service quality. Research instruments were developed with Webqual method of Quality Function Development (QFD) which means: "a structured and disciplined process that gives meaning to identify and bring the voice-of-the-customer through each stage of the product and or service development and implementation (Slabey, 1990). Webqual already developed since 1998 and has undergone several dimensions of interaction in the preparation and 14 grains of questions (Barnes and Vidgen: 2002). Webqual compiled based on research in three areas:

1. Quality of information from the research information system (Information Quality), is the quality of the content contained on the site, inappropriate, or at least user information for purposes such as accuracy, format and relevance
2. Interaction and service quality of the research information system quality, is the quality of the interaction of service experienced by users when they are investigating into the site more in fulfilling the trust and empathy
3. Usability is the quality associated with the site design as an example of appearance, ease of user navigation and the picture presented to the user

Amr Sahmono (2008) conducted research on "*Analysis of customer satisfaction Visitors to the site Online Community Forum subforum www.kaskus.us sale*". His research shows dimensions webqual used is composed of usability, user convenience, entertainment, complementary relationships, customer service and service interactions between buyers and sellers. Attributes that have the most powerful influence and can be used as indicators of the attribute satisfaction the suitability of information for the purpose, function private message, interactive features to achieve the objectives, projections to the site and security interact.

### 3. METHODOLOGY

This study uses survey methods to measure student perceptions about the quality of student services, web-based digital locker. Research sample is a student of a college student who has a digital locker facilities. Respondents are drawn with a sampling judgment that can represent the level, study programs, gender and several other student attributes. Research instruments adapted from the techniques Webqual from Barnes and Vidgen (2001) which consists of four main variables, namely Usability, Interaction, Information Quality and Public Information. In addition to these four main variables, questionnaire also equipped with other variables of students Demography, the intensity of Internet usage, the level of ICT adoption, and behavior of Internet usage among the students. WebQual use 7-licert measurement scale ranging from 1 (strongly disagree) to 7 (strongly agree). Analysis techniques used include descriptive analysis and hypothesis testing to see the effects of variable webqual Demography. Analysis of the relationship between ICT adoption by the perception of the quality of the web service using discriminant analysis.

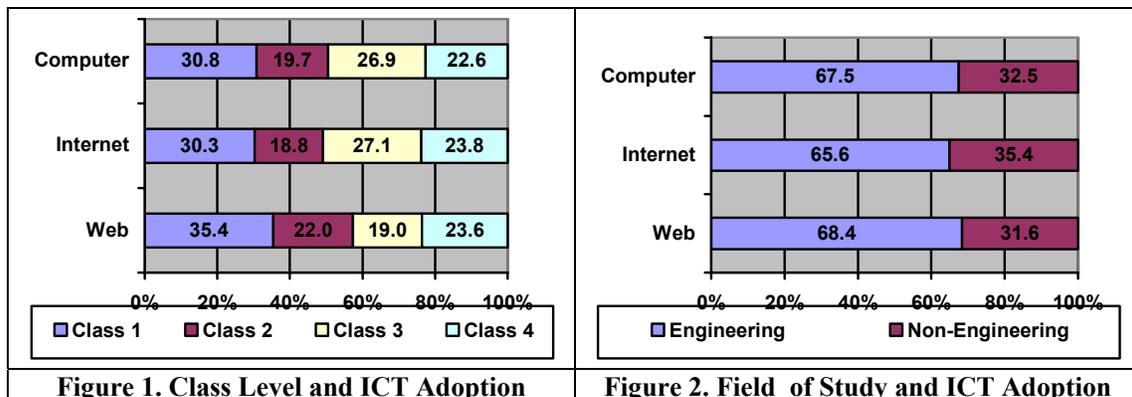
### 4. RESULT AND DISCUSSION

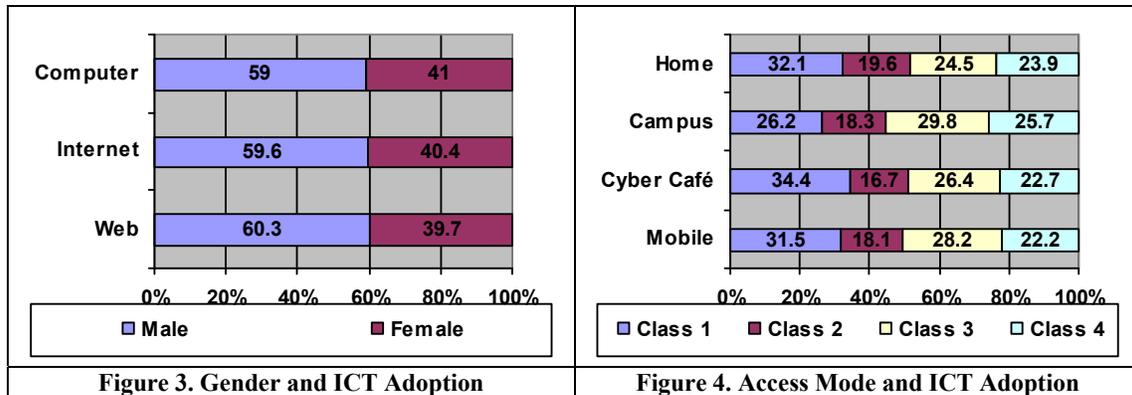
#### 4.1. Research Instrument Development

Survey using a questionnaire adapted from the (Barnes and Vidgen: 2002) for WebQual variables. Measurement scale using a 7-licert scale with the details of an item that is variable interaction consists of 5 items, the variable quality of information consists of 6 items, usability variables consist of 6 items, and overalls variable consists of 9 items. An additional variable is the level of ICT adoption for personnel computers, mobile phones, internet, personal website; and Internet usage behavior. The intensity of the use of student features digital lockers also observed to see the level of utilization of academic information services among college students. Demography graduate students include the gender, field of study, classes, study programs, etc. Reliability analysis shown that usability of 0.62, information quality of 0.82, and interaction of 0.88 with high reliability based-on Cronbach's Alpha have been identified. Moreover, usability of 0.75, information quality of 0.78, and interaction of 0,84 with high validity based-on KMO/Kaiser-Mayer-Olkin and Balettet's Test have been achieved.

#### 4.2. Student Demography and ICT Adoption

The number of respondents is as much as 249 people consisting of 150 men and 99 women. The composition of the respondents viewed from the level or class1 was 32.1 percent, class 2 was 19.3 percent, class 3 was 26.5 percent, and class 4 was 22.1 percent. Amount respondents derived from engineering courses are 67.1 percent, while the non-engineering classes as much as 32.9 percent. All respondents who have personal computers as much 94 percent. Most of the respondents use access the internet as much 87.6 percent and respondents have website are 83.9 percent. Respondents access internet in the campus environment that is as much 76.7 Percent, at home 73.9 Percent, use mobile access 86.7 percent, and 86.7 percent in the cyber café. General description of the comparisons of ICT adoption visits from student Demography can be seen in Figure below.



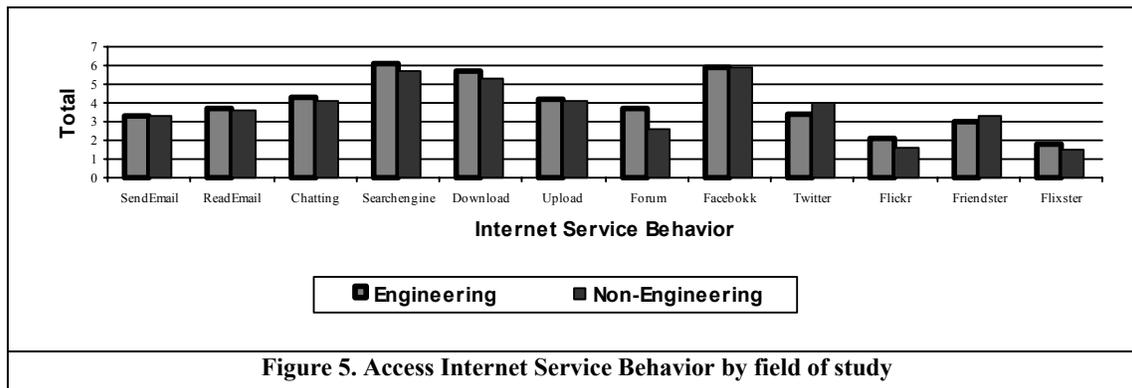


The results show that ICT adoption is more dominated by low class, male, and the field of engineering study. Internet adoption levels more students who access the Internet at home compared to students who access the Internet. This condition indicates that user education should be increased in students class 3 and 4, and in the field of non engineering study. Based on class and ICT Adoption are class 1 are dominated in computer as much 30.8 percent, internet as much 30.8 percent, and have web as much 35.4 percent. According field of study engineering as much 67.5 percent have computer, use access internet 65.6 percent and have website/blog as much 68.4 percent. Gender was dominated by Male, that are 59 percent have computer, 59.6 percent use access internet and 60.3 percent have website/blog. Access mode by home dominated class 1 as much 32.1 percent, from environment campus as much 19.6 percent, from cyber café as much 24.5 percent, from mobile are 23.9 percent. The research results according to various studies on gender and the Internet adoption, such as Aida Bahta and Hisae Utsumi (2004) says The revolution brought by ICT has been hope to elevate gender inequality, however, it has also brought a new form of disparity know by ‘digital divide’. This calls women, particularly those in higher education and research institutions to act swiftly and make use of this technology as much as their counterparts. A gender Internet portal can be one of the solutions to network their activities and resource available and can play a coordination role.

According to Gefen, D. and Straub, D (1997) mentioned indicate that women and men differ in their perceptions but not use of E-mail. These findings suggest that researchers should include gender in IT diffusion models along with other cultural effects. Managers and co-workers, moreover, need to realize that *the same mode of communication may be perceived differently by the gender*, suggesting that more favorable communications environments might be created, environments that take into account not only organizational contextual factors, but also the gender of users. The creation of these environments involves not only the actual deployment of communication media, but also organizational training on communications media.

### 4.3. Student Demography and Internet Usage Behaviour

Most students access the Internet every day that is counted 108 people or 43%. However, more students are not accessing the Internet for college, which is as much 3.6percent. The number of students who have a personal website is more enough that is 83.9 Percent, and was dominated by men and students of computer courses. Internet usage intensity for each feature and the frequency of service utilization of student digital lockers feature can be seen in the picture below.



As shown in figure 5 and 6, the Internet service that behavior is the most widely accessible to search engines, download and upload both to the engineering courses and non-engineering. This is due to the tendency of students as users of the Internet requires a lot of information, to download to get information and their activities to friends in the virtual world through a social networking system

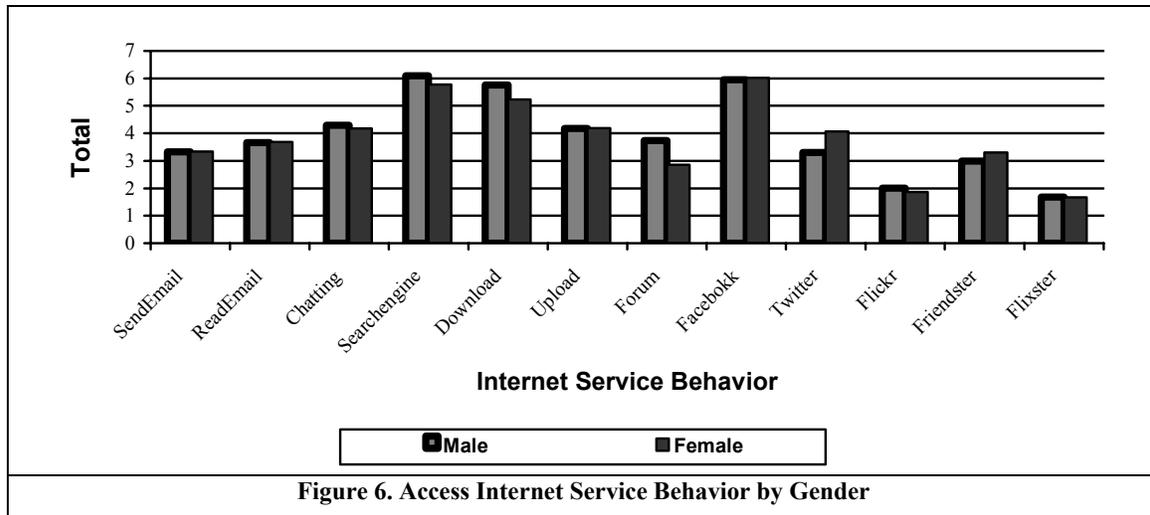


Figure 6. Access Internet Service Behavior by Gender

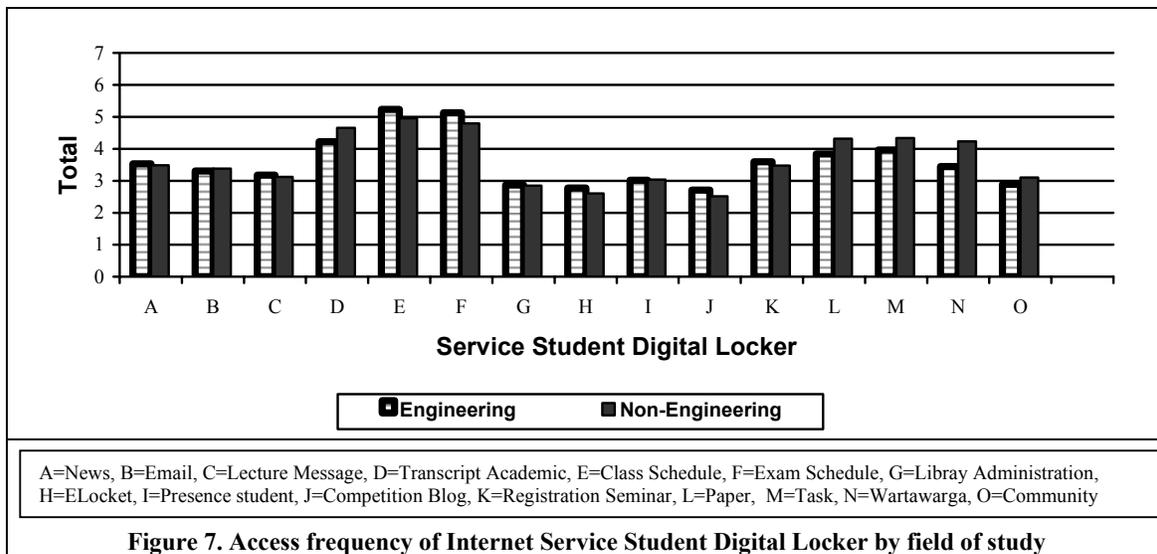
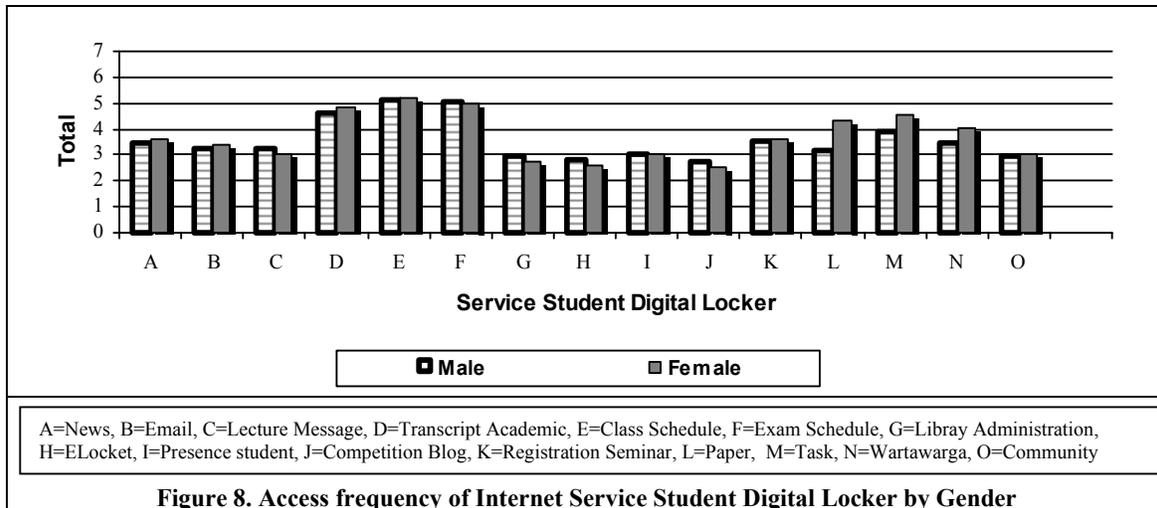


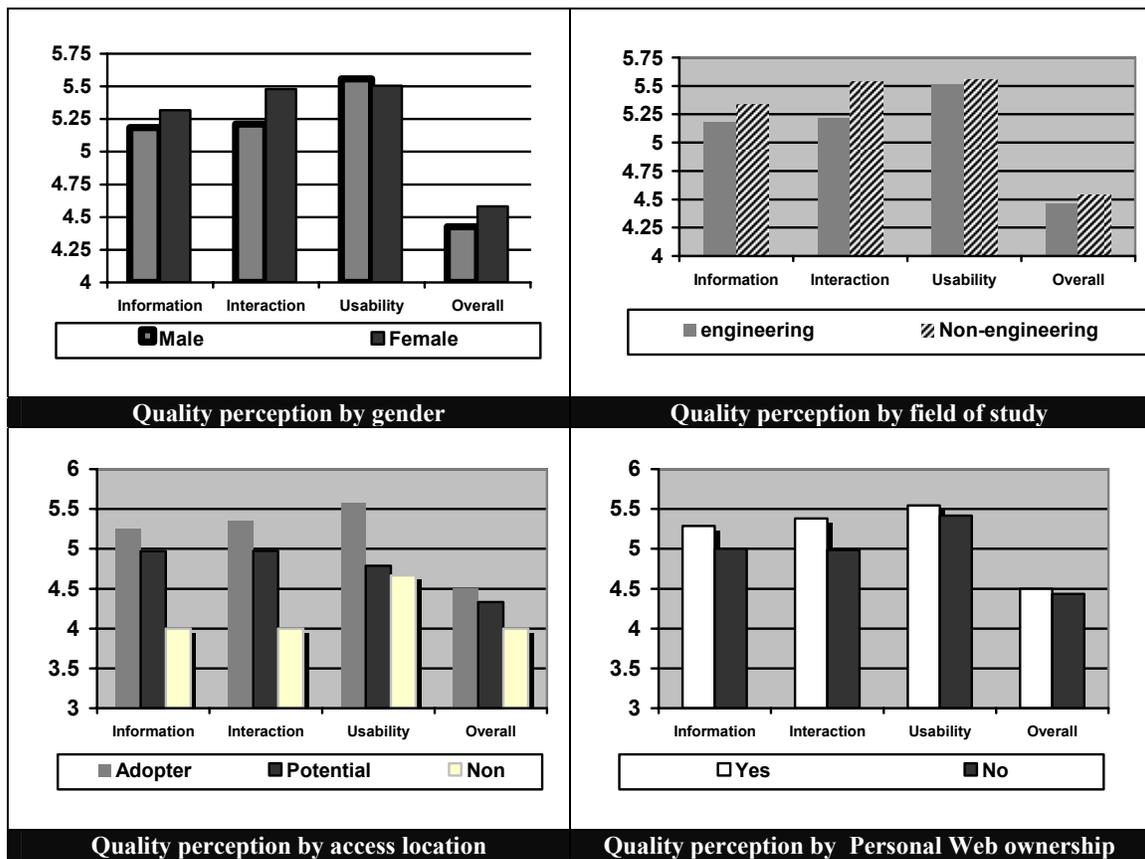
Figure 7. Access frequency of Internet Service Student Digital Locker by field of study

Figure 7 and 8 show the pattern of student use of the service on a digital locker. The information accessed is a lot about summary score, class schedules and exam schedules. This tendency exists in all categories of good engineering students, non-engineering or by gender, both male and female. This information is more accessible for all students of all categories always required that information. While services are rarely accessible to the library administration, the electronic letter and the registration of the competition blog. These services are rarely accessible to students by category faculty and gender, because the service is only required for student final class in administration library and electronic letter, while the race was held only blog exclusively or not at all times.



#### 4.4. Website Quality Perception Analysis

Variable WebQual generally highly valued from the perspective of students, except for the variable overall relatively lower than the interaction variables, information quality, and usability. Variables that were considered most high quality is usability, followed by quality of interaction and information. Differences in perception of quality views of gender, field of study, access location, and ownership personal website can be seen in the picture below.



The results of hypotheses tests on the influence of Demography shows that gender and class does not affect perceptions of service quality websites. Field of study only affect the perception of service quality website only

for the interaction variables, while the other three variables are not affected. The results of the analysis shows that a digital locker service quality relative assessed as viewed from the perspective of men and women and student classes. Several factors are likely causes related to these findings include the socialization of student lockers that had been started from the level and intensity of use of a digital student lockers are relatively high because of some academic information and learning to be Paperless. Based on traffic monitoring, digital student lockers is one of the sub domain of this high traffic sub domain other than the college which became the subject of research. The number of members of the student lockers reaches more than 20 thousand students. The intensity of socialization and utilization becomes one of the suspected factor influencing perceptions of the quality of common student services digital locker.

Discriminant analysis results showed that 4 variables can be used as predictors of personal computer adoption rate among the students, but the highest differentiation factor is significant only for the variable usability. The level of the model predictions are for 64.7%. Finding suggests that students tend to rate high on student digital locker benefit from interactions and quality than the quality of information. The fact is in accordance with the characteristics and purposes of student lockers that provide digital information needs of all students, such as scheduling classes, scheduling exams, Grade Point Average (GPA). Student digital locker not used for the interaction between fellow students or students with intensive teaching. In addition, the presentation format of academic information is more focused on the validity or accuracy of the data. Characteristic is a factor why students are more likely to rate higher than the variable interaction usability and quality of information. But overall, all the variables webqual valued by students as has been described previously.

## 5. CONCLUSION

Student digitally locker is one services academic information pertained tall intensity usage among student. Features most often utilized is class schedule, exam schedule and transcript academic whereas features relatively rarely utilized is library administration, Electronic Locket and competition blog. Adoption level ICT among relative tall covering ownership PC, HP, personnel websites, and internet access. However there differences adoption level such visits from gender and field of study. Women relative less compared men in terms ownership PC and personnel websites, and field of study engineering relative has adoption level ICT higher compared non-engineering. Types internet services most often utilized among student is browsing with search engine, downloads, and social network.

Students are generally considered high for the quality of student services digital locker, where the variable is the variable that assessed usability compared to the highest quality of interaction and information. Women's relative gave a lower rating than men although the hypothesis test results are not significantly different. Differences in field of study led to differences in the perception of quality assessment of web services for all variables where non-engineering WebQual showed a higher quality perception. Perceptions of quality webqual with 4 variables can predict students' views of the grouping level of ICT adoption. One implication of these findings is the need for training or socializing student lockers in a sustainable digital locker beginning of a new student, and the increasing penetration of ICT utilization in non-engineering classes.

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