**Title:** Internet usage for improvement of learning

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**Abstract**

The internet usage is increasing rapidly, especially for learning in the field of education and informatics. The investigation of identifying and analyzing internet usage for learning improvement is necessary to implement with students. In order to ensure the use of the internet improve students’ learning, it is necessary to investigate with developed and developing countries in the term of comparison. In our research conducted examining with students in one developed country (Sweden) and one developing country (Laos) to identify and analyze the relationship between internet usage and students’ learning. We collected data with survey through questionnaires by quantitative research, and analyzed the relationship by correlation analysis. Finding indicated that internet usage has the positive relationship with students’ learning as higher of using internet and higher of grade. However, the use of era technology and students’ learning in developed country are absolutely higher than developing country. Thus, we ensure that internet usage is a positive relationship with students’ learning.

**Keywords:** Internet for learning, learning improvement and human computer interaction
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Abbreviations

CD = Compact Disk
CPU = Central Processing Unit
DVD = Digital Video Disk
G = Passed
GUI = Graphical User Interface
HCI = Human Computer Interaction
ICT = Information Communication Technology
IS = Information System
ISL = Internet Support Learning
IT = Information Technology
LTM = Long-Term Memory
OS = Operating System
RAM = Random Access Memory
ROM = Read Only Memory
SPSS = Statistical Package for the Social Sciences
VG = Passed with distinction
WWW = World Wide Web
1 Introduction

1.1 Background

The increasing of internet usage reflects to new information technology as the world of communication technology network that can use to improve learning. The internet is also very important for people every life nowadays. Globalization makes opportunities and challenges for learners in higher education to emphasis on information and communication technologies (ICTs) such as internet usages (Macharia & Nyakwende, 2011). The internet is useful for searching information easily and helps students to do their homework with just only search on search engine that they want to know. It also let them to interact with each other for exchanging their idea and knowledge from a different location in a same time (www.scribd.com). The interaction between students offers them to gain different perspectives on a problem discussion by sharing one’s own learning activities with other learners into problem solving strategies (Salomon & Perkins, 1998; Fischer, Troendle & Mandl, 2003). So, internet based learning increase students’ satisfaction with learning as a very important mediating role (Liao & Hsieh, 2011). The internet is also useful community of resources to offer new possibilities for schools and the web technology (Crook, 1999). Students were active in communication and content creation as Internet/Web technology (Hill et al., 2004; Bekele & Menchaca, 2008).

The investigation of the relationship between internet usage and learning is useful to ensure that the learning improvement needs to emphasize on internet usage, and motivate students to use internet in their learning. According to Sylvia (2000), internet usage in education can help with individual learning and teaching such as: quickness of delivery, development of communication and writing skills and increase of motivation for learning and self-reliance. The internet is also necessary to use a specialized information system, along with the Universal International Research System.

In fact, the World Wide Web (WWW) is necessary for education and search information for students’ learning improvement. The use of information and communication technologies (ICT) is important for developing countries to develop their present and future educational plans such as: providing education for students in information processing, using new information and communication technologies, developing a high-speed research network connecting, extending national networks to existing educational structures (Sylvia, 2000).

Therefore, the investigation on internet usage for improvement of learning is necessary to do the comparison between developed countries and developing countries in the implementation of internet usage in learning. This can help us identify distinctive improvement of learning between developed and developing countries. The relationship of internet usage and learning will provide an avenue to enhance learning environment and technology for problem solving in economics, society and politics. Sylvia (2000) stated that developed countries emphasize on internet usage to develop education as they are developing extensive programs of internet integration in education. The internet usage is also very important for the developing countries to seek taking part in the global educational community. Therefore, we ensure that this is the area of informatics.
1.1 Statement of problem

The World Wide Web (WWW) is invasive in our social life, especially in the improvement of learning is necessary for searching and exploration of internet usage. However, the developing countries are lack of internet usage for their learning in education. They need to improve the Information Communication and Technology (ICT) to be effective for learning improvement, because internet-base learning network is necessary to enhance participants’ learning in the way of development. The use of internet for learning improvement is very high in developed countries, whereas in developing countries are lacks of use and need to motivate using internet that focus on learning.

Therefore, in this research tries to investigate and identify of internet usage that how it can improve students’ learning, to ensure that the use of internet has relationship with learning environment. The investigation indicates the students’ behavior/circumstances on internet usage, so it is useful for improving Information Communication and Technology (ICT) in learning development.

1.2 Purpose of the study

The use of internet in learning is not fully implemented in most of the developing countries, especially for the students in the secondary school. Thus, the main purpose of our study is to compare the use of the internet for learning in the upper secondary school between developed and developing countries to ensure their enhancement of learning in the effectively and efficiently. And we also try to find out the relationship between internet usage and learning improvement with group of students in the upper secondary school. We address in investigation, identification and analyzing the use of internet to improve students’ learning that how it can create new open learning environment.

1.3 Research questions

For doing research on a subject and achieving his/her goal the researcher’s should keep some research questions in his/her mind. Base on the statement problem of internet usage for learning, we have the following research questions and sub-questions are listed below:

The main question:

*How can internet usage improve students’ learning in developing and developed countries?*

Sub-questions are:

- What are the relationships between internet usage and students’ learning?
- Can internet usage improve students’ learning?
- What are the differences of internet usage for learning between developed and developing countries?
- What important design principles can be used to create a more efficient HCI for internet based learning?
The result of sub-question1 will be good contribution to answer in sub-question2, because in sub-questions1 will indicate that internet usage has a positive or negative effect towards students’ learning. When we know internet can improve students’ learning, so it is important to investigate with students’ in different locations. Thus, the result of sub-question2 is helpful for sub-question3 to do the comparisons between developed and developing countries because of ensuring the internet is useful for students’ learning. The result of sub-question3 will help us to be clear the important of internet usage for students’ learning between developed and developing countries. Thus, it is essential to design interactive Human Computer Interaction (HCI) for internet based learning which cover sub-question4.

### 1.4 Target group

This thesis focuses on the young students to use internet in their learning improvement at upper secondary school in developed and developing countries. These groups can be useful participates in the implementation of internet usage for learning. Overcoming their learning problem by internet usage can be the solution and enhancement in efficient way of information technology that can assist them in future learning.

This research will also be a good model and the basis for the students who will carry out research in the field of informatics and information systems for the influences of internet usage for educational improvement.

### 1.5 Delimitations

Nowadays, internet usage is increasing rapidly that influences in social life and social network to distribute consequences in the positive and negative ways. However, this thesis focused on the positive effect of internet usage for learning improvement. We investigate and identify internet-based learning in education and the benefit of internet usage for learning improvement that related to social network influences in communication of learning environment. The limitation of our thesis is covered in one developing country in Vientiane, Laos and one developed country in Borås, Sweden. The result of this research will have the positive impact on internet usage for the learning environment.

### 1.6 Expected outcome

The benefit of internet usage can improve the status of learning environment. This research tries to find out the positive relationship between internet usage and learning. The finding from developed countries can be trend in developing countries of learning improvement. This thesis will provide valuation of information and technology in learning improvement. Internet-base learning motivates students of using internet, especially for the young students in upper secondary school to focus on internet usage in their learning. It will also useful for educational institutions to motivate their students on internet usage for learning enhancement.
1.7 The authors’ own experience and background

This research is conducted by two master level students of Högskolan i Borås studying in informatics, Sonexay Chanboualapha and Md. Rofiqul Islam. Both have different past experiences and backgrounds.

Sonexay Chanboualapha has experiences in the field of teacher in university for 3 years, and also works as a computer technician of hardware and software fundamental and computer network. Md. Rofiqul Islam has research experience of writing a few international journal papers, articles, reports and analysis of different publications during his academic career. He has written research papers on Evaluations of the parallel extensions in .NET 4.0.

1.8 Structure of the thesis

The following figure 1 illustrates the overview of research design. Start with the first section as the background of research area bases on the previous research. In this study relates to the field of informatics and towards the statement of problem to generate the research questions. For the next section describes the research strategy, data collection methods and strategy for validity finding. Data collection methods will provide the direction of theoretical study that interacts with the key concept to be the theoretical finding. Empirical study will provide the survey to get the result as empirical finding into data analysis with theoretical finding. The result from data analysis will be the good answers for research questions to be discussion in the conclusion of result evaluation for validity findings.

![Figure 1: Research strategy](image)
2 RESEARCH DESIGN

In this chapter describes the research perspective and research strategy that has been conducted with the research. This also includes the structure of data collection and data analysis into the strategies for validity findings and result presentation to complete in research design.

2.1 Research perspective

Positivism and hermeneutics theories are major scientific research perspectives to be research approaches. Positivism is grounded in a research philosophy as focusing on hypothesis testing and phenomenology to construct interpretation, and about the social world (Insights, 2009). Positivism is an epistemological position that advocates the application of the methods of natural sciences to the study of social reality, and probably the most important attempt to generate knowledge (Insights, 2009; Bryman & Bell, 2011). A positivist philosophy has a number of key characteristics and also as the one of the more popular approaches to conduct with research in the fields of information systems (Brooke, 2002; Insights, 2009). Hence, our research purpose is to find out the relationship between internet usage and students’ learning in the upper secondary school. We address in investigation, identification and analyzing the use of internet for students’ learning improvement that how internet usage can improve students’ learning. Therefore, the most relevant approach is positivism that it provides infrastructure in theoretical study and statistical analysis of quantitative research.

Quantitative and qualitative researches are the main approaches to conduct in a scientific research (Bryman & Bell, 2011), to search the problem in data collection and data analysis that described below:

Quantitative research describes as the collection of numerical data and exhibiting a view of the relationship between theory and research as deductive and having an objectivist conception of social reality (Bryman & Bell, 2011). And the example are the features of quantitative research as: a measurement of social variable, common research design as surveys and experiments, numerical and statistical data, deductive theory testing, positivist epistemology, objectivist view of reality as external to social actors. Quantitative data also comprise of nominal data, ordinal data, interval data and ratio data etc... (Oates, 2006; Bryman & Bell, 2011) that implement data analysis section. Bryman & Bell (2011) point out that “deductive theory represents the most common view of the nature of the relationship between theory and research”, so the hypothesis is necessary for quantitative analysis in statistics of relationship to collect and analyze data.

Qualitative research concerned with word rather than numbers that describe in Bryman & Bell (2011) in the feature as: understanding the subjective meaning held by actors (interpretivist epistemology); common methods: interviews and ethnography; data are words, text and stories; inductive approach: theory emerges from data, and social constructionist ontology. Qualitative research based on an understanding of human behavior, and concerned with the meaning of people’s perception in the social phenomena of action, belief and decision
(Denzin and Lincoln, 2000; WiseGeek, 2011), to implement on the part of observation and interviewing participants.

To obtain a comprehensive understanding on the data collection and analysis with the relationship between internet usage and students’ learning, we use quantitative research to deal with our research.

2.2 Research strategy

Research strategy is a plan structure of searching information to complete the task with effectiveness and efficiency. Saunders, Lewis & Thornhill (2000) point out that the research strategy specifies the source of data constraints and how they will be addressed. It also considers the restriction that researchers will have success in data, time, location and money. So research strategy needs to be clear to specify the sources of research questions and determine collecting and analyzing data that base on the general idea to solve the research questions.

Comparative design is worth distinguishing one further kind of design as embodies the logic of comparison. It implies to understand social phenomena better when they are compared in relation to two or more meaningfully contrasting situation, and comparative design may be realized in the context of either quantitative research (Bryman & Bell, 2011). They also point out that the comparative study is not different from the cross-sectional design. So, survey research comprises a cross-sectional design in relation to which data are collected predominantly by questionnaires on more than one case and at a single point in time in order to collect quantitative data in connection with two or more variables, which are then examined to detect patterns of association.

The purpose of our study is to compare the use of the internet for students’ learning in the upper secondary school between developed and developing countries. This research also explores the relationship of internet usage for improvement of learning. We implement in quantitative research to identify data collection and data analysis with statistics to solve research questions. At first, our research focuses on generation of research questions and formulate for the purpose from research questions. Then, we study theoretical as describe in the chapter3 that related of purpose base on research questions, and design hypothesis about relationship between learning and internet usage. After that, the empirical study conducts with structured survey questionnaires with students in upper secondary school and design for selecting the target group of participants for the survey. Then, we collect the necessary data with all participants by answering questionnaires in numerical statistics. After data collection, we form hypotheses for testing result and use summary of description of theoretical data into analysis with empirical data. For analyzing empirical data, we use the statistical software SPSS to get the result of scientific research. Finally, we can come up with our conclusion and answers the research questions.
2.3 Data collection procedures

According to the research perspective, we conducted in quantitative research and collected data through survey questionnaires. The theoretical and empirical study will transform to theoretical and empirical data collection for analysis.

2.3.1 Theoretical data collection

In theoretical study, we use literature review for theoretical data collection. According to Bryman and Bell (2011), "Literature review is the process of identifying relevant information or investigation of research on a subject and helps students to find out a topic, support methodology, provide a context or change research direction”. Literature review provides the basic to justify the research questions, and demonstrate that able to engage in scholarly review based on reading and understanding of the work of others in the same field (Bryman and Bell, 2011). They also stated that literature review able to interpret what authors have written, possibly by using their ideas to support a particular viewpoint or argument. Theoretical data collection of this research involved collecting data from relevant areas such as: learning, distance learning, IT in education, improvement of learning, internet for learning, E-learning, Limitations of internet usage for learning in developed and developing countries, HCI, communication and interaction design. These are published by journal articles in online library databases of the University of Boras, Books, conferences, previous research articles of BADA, and many sources from internet by search engines. These sources are relevant of internet-based learning that concern with improvement of learning. In order to fulfill the purpose as research questions, the theoretical study needs to study with the previous researches and relevant to the empirical study.

2.3.2 Empirical data collection

After theoretical data collection, empirical data collection will be conducted by quantitative research through a survey that based on the theoretical findings. According to Bryman and Bell (2011), questionnaires are one of the main approaches for gathering data using a social survey design in quantitative research. Thus, questionnaires are convenient for respondents to complete a questionnaire when the participants want as self-completion questionnaires (Bryman and Bell, 2011). Therefore, the survey conducted through questionnaires with students in upper secondary school who have experiences of using internet in different locations as developing country in Vientiane, Laos, and developed country in Borås, Sweden.

In fact, our research can conduct investigation with any group of students. However, in our purpose study is to investigate with the students in upper secondary school, because they are the new generations to become university students that highly interact with the era of technology as well. According to Kuhn (2006), children try to solve problems in learning more than adult like strategies because they like to practice with similar problem over time. Thus, we believe that upper secondary school students are strong interested with the era of technology as internet usage. We selected the students in class year 9 (15-18 years old) because they are oldest students in the upper secondary school to become the adults soon and they are higher experience of using internet than other as the challenging of internet usage for
learning. We selected one developed country (Borås, Sweden) because it is the location of our university study. We selected one developing country (Vientiane, Laos) because it is the location of author’s (Sonexay Chanboualapha) living. So, these locations are convenience for us to investigate survey in our empirical study.

The questionnaires for survey, there are two sections such as students’ learning and their internet usage. The collection for students’ learning is about their study result or level of grade and their perception. The collection for internet usage is about their frequency of using internet, reason of use, times and purpose (see detail of survey questions in appendix). The implementations of survey questionnaires will help to identify empirical finding for data analysis with theoretical finding.

2.4 Data analysis procedures

Data analysis is important and necessary for the processing from empirical finding and theoretical finding to understand the results. Thus, the data analysis is necessary to conduct with empirical analysis and theoretical analysis. We compared our empirical findings with theoretical findings for analyzing our research result.

2.4.1 Theoretical analysis

The theoretical analysis summarized theoretical findings to identify and analyze the different information from various sources like internet, different websites, different books and Journals. It concerns with research goals as internet usage for improvement of learning in order to compare with empirical findings. Quantitative data analysis is an approach to conduct with our research that analysis numerical data involves examining, categorizing, tabulating, and survey questionnaires or recombining the collected data (Yin, 1994; Bryman, A., & Bell, E., 2011). Thus, we have used summary of description of theoretical data into analysis with empirical data.

2.4.2 Empirical analysis

After the theoretical finding, the empirical study for empirical analysis has been conducted by survey in quantitative analysis of Bryman & Bell (2011). And quantitative data analysis (statistical significance) concerns with our purpose to analyze data in level of learning and time spend of using internet by using correlation analysis about relationship with numerical statistics.

The survey conducted with the same structured questionnaires between students of upper secondary school in Laos and Sweden. The questionnaires are pre-code to answer simply for students by choosing and writing the number. After collecting data, we form the structure of analysis in the table as level of the learning perspective compares with internet usage perspective from different student groups of developed and developing countries. The data has been analyzed by statistical software SPSS and Microsoft Excel. The analysis will present in text, table, graph and charts of statistics. After that, we analyze through a summary of description of theoretical findings with empirical findings and ending with a discussion of our research result in the conclusion.
2.5 Strategies for validating findings

There are several ways of establishing validity and reliability in quantitative research as devised to gauge a conceptual measurement. Reliability and validity are essentially concerned with quantitative research (Bryman & Bell, 2011) that related to our purpose study of the relationship between internet usage and learning.

According to Bryman & Bell (2011), reliability is concerned with particular issues in connection with quantitative research that link with the question of whether the result of the study is repeatable. Validity is concerned with the integrity of the conclusion that is generated from a piece of research. The three categories of validity such as: measurement validity, internal validity and external validity of Bryman & Bell (2011) that describes detail in below:

- Measurement validity applies to search for measuring social scientific concepts primarily in quantitative research, and it is also often referred to as construct validity that related reliability.

- Internal validity relates mainly to the issue of causality, to be a reasonable of measurement in quantitative research. It is concerned with the questions of whether a conclusion that incorporates a causal relationship between two or more variables holds water as independent variables and dependent variables,

- External validity is concerned with the question of whether the results of a study can be generalized beyond the specific research context that the issue of how people or organizations are selected to participate in research becomes crucial.

In our research is about the relationship between internet usage and learning improvement to investigate by survey from students’ in secondary school in different locations. Reliability, measurement validity, internal validity and external validity, are relevant to our research.

2.6 Result presentation method

The result of this research will be presented in text that describes of the benefit of using internet for learning includes with the relationship. It is also presented with the numerical statistics in tables, charts and graphical diagrams. It describes the relationship between internet usages and learning including the comparison of different location.
3 THEORETICAL STUDY

In this chapter of thesis provides the key concepts that relevant to the different subject areas which follow the research questions.

3.1 Key concepts

This section mentions short description about the important concepts of literature sources which are relevant to internet usages for improvement of learning.

3.1.1 Internet

The internet is an electronic system as interconnected computer networks of a global network system to share and publish of huge information resources and services, by online of the World Wide Web (WWW) and the infrastructure to support email.

3.1.2 Information Technology (IT)

Information Technology (IT) concerns with the computer system which help to store, transfer, process and present the information. The main goal of Information Technology is to make the people and society benefited by it.

3.1.3 Learning Improvement

Improvement of learning in education emphasizes on human resources development that enhances the current learning situation to be better in the future. There are several approaches and techniques to improve learning, includes the materials and new technology to be more effective and efficient learning. It is important and necessary to explore the way of convenient approaches and techniques for ease of learning situation in education.

3.1.4 Internet-based learning

The interaction between peoples is the way of generating new technology network to communicate with each other in an efficient way. Internet base learning concerns with the interaction of people and internet through online education service providers that is relevant to HCI perspective. Nowadays, the internet becomes the center of learning to share huge information and communication for education such as: e-learning and distance learning.

3.1.5 Developing and developed countries

Developing country as the country is low per capita income that people have a low living standard, low human resources development, and lower economic growth. Whereas, developed country as the country is high per capita income and most of the people having a higher standard of living, economic growth and also higher human resources development.

3.1.6 ICT applications in developing countries

Most of the developing countries are using different types of Information Communication Technology (ICT) applications such as: fixed telephone and cellular telephone services and
low bandwidth broadband internet service. And these applications help to speed up the development of a country with time.

### 3.2 Subject areas relevant for the research

The relationship of subject areas and research questions are linked together for the research that is described in the diagram below:

![Figure 2: Subject areas relevant for the research](image)

**Sub-question1:** What are the relationships between internet usage and students’ learning?

**Sub-question2:** Can internet usage improve students’ learning?

In the figure describes in the subject areas of Learning, Distance learning, IT in education, Improvement of learning and internet for learning. These are also described in the relationship between internet usages and improvement of learning, so these are relevant for the sub-question1&2.

**Sub-question3:** What are the differences of internet usage for learning between developed and developing countries?

In the figure, E-learning and Limitations of internet usage for learning in developed and developing countries are described of the learning environments in the different locations to compare learning situation, so it is related with sub-question3.

**Sub-question4:** What important design principles can be used to create a more efficient HCI for internet based learning?

This figure, Human Computer Interaction, Communication and Interaction design are useful for learning in an effective and efficient way, so they are related in sub-question4.

[11]
3.3 Previous research

ANDO, Takahira & Sakamoto (2004), examined in the effects of daily internet use of elementary school students, they argued that internet use of students may have positive effects on their attitude toward learning, and also Web-site browsing and Web-page making. It had positive effects on self-efficacy, however the positive effects of internet use on students’ attitude toward learning are not strong relationships. Moriyama et al. (2009) conducted with junior high school students about the relationships between student’s self-efficacy and learning experience of information education. The result turned out that almost half of the students feel the effectiveness of gaining computer-operating skills that internet, information and computer could promote the feeling of effectiveness in current daily lives. The self-efficacy was affected from processing ability of information and creation ability of information in abilities for information utilizing. Nwezeh (2010) conducted with 750 university students by questionnaires about the impact of internet use on learning. The finding indicated that the internet is very useful for students’ learning that it had assisted them generally in their areas of specialization. It helped them in writing their technical reports, assignments, seminar papers, interaction with friends and relations. Edem & Ofre (2010) examined in undergraduate students by 133 responding of questionnaires about reading and internet use activities. They found that 61.5% of the students preferred reading books, journals and newspapers from internet searching. Thus, both reading and internet usage are related and important to their academic activities. Liao & Hsieh (2011) conducted with 600 university students about internet-based learning. They found that the social influence had a positive effect on perceived playfulness, satisfaction, and performance expectancy that the internet should increase students’ satisfaction with learning. Bekele & Menchaca (2008), conducted a study on internet affect learning in higher education which includes theoretical issues and methodology on the internet supported learning. Their study also included a constant comparative, qualitative analysis of 29 studies indicated grade achievement was the prime measure of effectiveness in ISL environments that let students could be participating and accessed conveniently in learning anytime and anywhere. The media/multimedia technologies also allowed interactions between students and instructors to take more time for reflection, motivation, participation and satisfaction for them.

3.4 Relevant literature sources

Internet usage can improve effective and efficient learning. The technologies enhance learning is the way of development which offered vast opportunities for self-managed learning in educational advantages independently. Thus, Internet use is the era of technology that implemented in the improvement of learning. Derry (2007) points out technologies enhance learning concerns with learning by doing or action learning (Bourner, Beaty, Lawson & O’Hara, 1996; Sandelands, 1998), to offer opportunities for self-managed learning through internet use (Koo, 1999). Liao & Hsieh (2011) focused on internet-based learning that can help students’ learning, and let them develop their competence to be more active in learning and share information each other on internet online network (Hofmann, 2002; Koper, 2009; Sloep & Berlanga, 2011). Therefore, internet-based learning shows the relationship between internet and learning. Students can practice their knowledge when they use the internet and
exchange or share idea with each other on the communication network. It is also critical, beneficial and necessary for distance learning which concerns with human computer interaction perspective. Communication is also necessary for learning improvement to be an interaction of sharing or exchanging information with each other in learning-teaching process (Karadag & Caliskan, 2009). This concern with Human Computer Interaction (HCI) as the relationship between people and computer systems to develop knowledge of capability (Hewett et al., 1992; Martin, et al., 1997; Harper, Rodden, Rogers & Sellen, 2008). Kohn, Maier, Thalmann (n,d), shows a methodical outline of knowledge transfer barriers to developing countries which are identified on the basis of a review of selected case studies. It is concerning e-learning initiatives in developing countries and also demonstrates adaptive solutions to overcome these barriers. Broad, Matthews & Shephard (2003) discusses the functions of different stakeholders and suggests the structure which might be falling and every group of stakeholder is given an account to use it where internet is put and current regulations may exist or desirable. Hallnäs & Redström (2006) describes interaction design in two sections as foundations and experiments. Foundation deals with theoretical issues of interaction design how interaction design acts and experiment describes how experimental design plays a central role when developing a new design theory.

### 3.5 Learning

Learning for education acquires new or modifies existing knowledge, behaviors, skills, abilities, preferences and involve different types of information. However, communication helps learning by interaction which sharing or exchanging ideas to identify and analyze to be a clear understanding with each other. Therefore, electronic network helps people active and efficient interaction for communicating and searching huge of information in more effectively. Thus, learning/studying from internet is critical to enhance and update the new social life and efficient education. The term theories of learning, Merriam & Caffarella (1991) point out four perspectives of learning theories as Behaviorist, Cognitive, Humanist and Social Learning.

#### 3.5.1 Behaviorist

Behaviorism concerns with divergent of constructivism and believes that knowledge does not depend upon introspection which contributed development (Boghossian, 2006). Behaviorism is a psychology of science underlying the science of behavior that was strongly influenced by positivism which only recognized natural phenomena or properties of knowable things, relations of coexistence and succession (Amsel, 1989; Moore, 2011). Behaviorist orientation is fundamental of current educational practice as adult education, behaviors which ensure the survival of cultures and the species (Merriam and Caffarella, 1991). The behaviorist movement of psychology has looked to the use of experimental procedures to study behavior in relation to the environment (Smith, 1999).

According to Merriam & Caffarella (1991), the behaviorist perspective has three assumptions which are held to be true and described below:

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[13]
• The study focuses on observable behavior rather than internal cognitive processes through learning behaviors.
• The learning is determined by the elements of the environment, not by the learners and learners’ behaviors are determined by the environment.
• The contiguity and reinforcement principal are essential to explaining the learning process.

Hartley (1998) in Smith (1999) pointed out four key principles of learning come to the fore:

• Activity is important for learning to practice active knowledge as learning by doing.
• The important notions are repetition, generalization, and discrimination, and frequent practice in varied contexts and necessary for learning to take place.
• Rewards and successors are positive reinforcement and punishment, and failure are negative reinforcement.
• When the goal is clear, then learning is very easy, and its concerns with competencies and product approaches to curriculum.

### 3.5.2 Cognitive learning

Cognitive learning theories concern with a person’s brain and nervous system, which share the people’s perspective as actively processing information and learning takes place through the efforts of the learner (Merriam and Caffarella, 1991). Piaget (1926) identified four stages of mental growth of cognitive learning as sensorimotor, preoperational, concrete operational, and formal operational, to explore changes in internal cognitive structure. According to Hartley (1999), learning results from inferences, expectation, and making connections, and prior knowledge, which is important to acquire learning plans and strategies. He also identified some of the key aspects of learning associated with cognitive psychology, as described in below:

• Instruction should be well-organized for easy to learn and to remember.
• Instruction should be structured as inherent where logical relationships between key ideas and concepts, which link the parts together.
• The perceptual features of the task are important aspects of the environment.
• It is important to fit the things which are already known to be learnt.
• Learning approach and cognitive methods influence learning.
• Learners can get their information about success or failure by cognitive feedback through giving information - a 'knowledge of results' - rather than simply a reward.

### 3.5.3 Humanistic

Humanistic theories emphasize the potential for individual growth of learners that bring the effective functioning of the human into the arena of learning. And human beings can control their own destiny that humans are inherently desire a better world for themselves and others.
(Merriam and Caffarella, 1991). Tennant (1997) in Smith (1999) summarizes five levels on humanistic psychology as follows:

- Physiological needs to be satisfied before the next level comes into participate such as hunger, relaxation, thirst, sex, sleep and bodily integrity.
- Safety is necessary for logical, predictable world and people look to organize their world to provide for the greatest degree of safety and security.
- The peoples’ perception of love is important for their friendly relationship of their interaction.
- Self-esteem includes the desire for strength, achievement, adequacy, mastery and competence and also involves confidence, independence, reputation and prestige.
- The full use and expression of talents, capacities and potentialities are expressed as Self-actualization.

Rogers (1993) in Smith (1999), found the following elements as being involved in significant or experiential learning as:

- The qualities of personal involvement are both feeling and cognitive aspects being in the learning event.
- Humanistic learning is self-initiated where the impetus or stimulus comes from the outside, the sense of the discoveries of reaching out and comprehending, comes from within.
- Humanistic learning distributes different behavior, the attitudes, perhaps even the personality of the learner.
- Learners evaluate humanistic learning from their necessary, knowledge, experiences and perception.
- Humanistic learning takes place; the element of meaning to the learner is built into the whole experience.

3.5.4 Social Learning

Social Development Theory of Vygotsky in Crawford (1996) focused on the interaction between people with each other as connections, shared experiences and social cultural context. Culture development tools and social environments (speech and writing) are the keys of communicating needs that led to higher thinking skills (Vygotsky, L.S., 1978). Vygotsky also proclaims that, "learning which is oriented toward developmental levels that have already been reached is ineffective from the view point of the child's overall development. It does not aim for a new stage of the developmental process but rather lags behind this process" (Vygotsky, 1978). According to Vygotsky’s theory, social learning is the cognitive model that culture is the major determinant of individual improvement because culture is very important for learning development by which he or she is enmeshed. Culture practices children’s learning much through interaction and curriculum design should be emphasized on the interaction between learner and learning tasks. Learning conditions bring people together and organize a point of contact that allows for particular pieces of information to take on
relevance, and social learning theory posits that people learn from observing other people involves participation in a society of practice (Smith, 1999). These relate to the Vygotsky’s theory and also concerns with the interactions between people of learning as social learning and primary mechanism of learning based on observation of others in a social setting, to let people see the consequences of other’s behaviors (Merriam and Caffarella, 1991). They also point out four processes contribute to learning by observation as: attention, retention (memory), behavioral rehearsal, and motivation. These concerns with Bandura in social learning theory which human interaction between cognitive, behavioral, and environmental influences, as described below:

- **Attention:** To increase or decrease attention by various factors, includes distinctiveness, affective valence, prevalence, complexity, functional value.
- **Retention (memory):** To remember attention as you paid which are symbolic coding, mental images, cognitive organization, symbolic rehearsal, motor rehearsal
- **Reproduction:** To reproduce physical capabilities and self-observation, as the image.
- **Motivation:** Previous experience imitates into future benefits, and imagined incentives that perform in observation are expressed as motivation.

The people intentions of learning are engaged and the meaning of learning is configured through the process participations in a socio cultural practice. The increasing of participation in communities of practice concerns the whole person acting in the world (Lave & Wenger, 1991). In order to understand knowledge and context of learning that needs to drawing attention about it (Tennant, 1997). Most human behavior of learning to observe from another one and idea of new behaviors are performed which makes no sense to talk of knowledge. This is decontextualized, abstract or general, and new knowledge of learning are properly conceived as being located in communities of practice (Bandura, 1977 in Smith, 1999). Behavior is a consequence of choice that people are active agents in their own learning and lives and social learning orientation is included motivational strategies (Merriam and Caffarella, 1991). The learning lies about resources need to explore the extent to which people have access like libraries and internet access (Smith, 1999).

### 3.6 Distance learning

Traditionally distance learning has been used to provide educational opportunities for the group of students for whom the usual educational system are not suitable. For an example the people work in different place, studying at home, living in isolated places or people with physical disorder (Watabe, Hamalainen, & Whinston, 1995). Distance learning is a procedure of remote learning where teachers and students far from each other. Students can study by themselves without physically meeting in the classroom; they don’t need to go to schools or universities. As per the theory of Moore (1973), the successful teaching can take place even though the teacher and learner are physically separated during the process of learning. Distance learning programs and courses, mainly offerings Web-based, have entered the mainstream of higher education (Consortium, 2006).
Distance learning commenced in the twenty century and in this learning system everyone in the world in anywhere has opportunities to study autonomously. The use of the multimedia computer network becomes the leading technology of communication, observing a gradual breakdown of traditional barriers in the domain of learning (NYIRI, 1997). According to Douglas (1993), the more recent distance learning systems has used a hybrid approach by linking different technologies (e-mail, conferencing, CAI material, video link, audio-graphics, phone, fax) to provide comprehensive support, with each task matched to an appropriate medium for delivery and fulfillment.

According to Passerini & Granger (2000), the use of internet unwraps a new generation of distance education (fourth generation), by introducing sophisticated delivery tools which creates a standard with profound implications on the design of distance education courses. Distance education system is more than hundred years old. At the beginning of distance learning system, communication occurred through the printed media and the mail system. But now a day’s almost all forms of communication in distance education programs involve some level of electronic communication.

Moore & Kearsley (1996) identified three main evolutionary stages of distance education. These are 1st generation crossing the end of the 19th and the beginning of the 20th century, 2nd generation started in the early 1970s and 3rd generation early 1980s. In the first generation, the key communication is printed materials, usually customized textbooks that contain tutorial outlines and exercises. Students complete their assignments based on the textbook instructions and mail the assignments to the instructor, who provides feedback via first class mail. The second generation of distance education was British Open University degree-granting program in 1969 where the open-universities is reaching off-campus students, delivering instruction through radio, television, recorded audio-tapes and correspondence tutoring. The third generation distance education is the advantages of satellite technologies and the emergence of communication networks which facilitating the delivery of analog and digital content to computer workstations. In addition, these technologies also facilitate new forms of real time interaction with two-way videoconferencing, or one-way video and two-way audio communication. Nowadays, Internet usages open new generation distance learning system where technology empowers the joint exploration of the delivery mechanisms of previous generations, adding stronger collaborative learning elements.

Distance education alternatives became available to many students that the growing availability and power of the internet. The World Wide Web began to change the face of distance education as some distance video links and telephone bridges augmented classes (Tesone, 2004). Distance learning is coming on fast as the future is outside the traditional campus and classroom (Gubernick & Ebeling, 1997). Communications flows increase learners’ success through the use of technology that overcomes barriers including time and distance (Oh, 2003). According to the Consortium (2006), online enrollment reached 2.35 million during 2004, an 18.2% growth rate over 2003. Additionally, 64% of southern higher-education institutions identified online education as a critical long-term strategy.
3.7 Information Technology (IT) in education

“Information is the source of energy which drive to become a huge enterprise of energy system” (Thomas, 2000). Information technology (IT) pursues scientific methods in education and the social sciences which help producing teaching, learning and understanding process. IT in the field of education in a stage is characterized by the presence of certain assumptions. So the contribution of using computers in school is the part of successful integration of information technology in education (Maddux & Johnson, 2009). According to Hawkridge (1983), IT in education is being used by learners in their attempts to solve the challenge of educational effectiveness. He also mentioned about some IT application which deal with learning and teaching in primary schools, secondary schools, learning in higher education, in vocational and continuing education and in formal learning by adults.

Nowadays, the higher education community relies on a variety of information technologies, which permeates every aspect of the institutional mission: instruction, scholarship, research, service and economic development, and the quality of institutional IT infrastructure, services. It supports to everyone in the school or university as student, instructor, applicant, researcher, staff member, executive, or alumnus (Lassner, 2000). Many authors point out in the literatures of their articles that the use of information technology in education, when properly integrated into the school curriculum can be a positive impact on students’ learning, that improve learning and teaching (Johnson & Maddux, 2008). The universities have traditionally fulfilled their various functions and possibly even the university as the provider of those functions in progressing of IT will become rapid and cheaper at an exponential pace for the foreseeable future, enabling alternative ways (Wulf & Duderstadt., 2003). Human resources systems function for higher education to rely on specialized student information systems. It can manage recruiting, admissions, registration, curricula, course scheduling, student records, student accounts, advising, degree audits, and transcripts (Lassner, 2000). Advanced application of information technology for education center could be successfully responded to the present situation. However, the structure of services can be established and maintained without forming strength organization that would become challenging in the future. Thus, competent users can work with specialists on developing applications of information technology (Milinovic, Tingle & Vrga, 2003). Information technology (IT) is convenient to represent specific, identifiable needs and communities in most colleges and universities (Lassner, 2000). It will continue to be critical success with students and communities which keeping pace with change in order to remain present, and to be innovative and responsive to college or university needs (Ahmed, Daim & Basoglu, 2007). According to Bureau (2004), Information Technology (IT) concern with the following criteria:

3.7.1 The effective application of IT in education

- It is very essential of using IT in education, leadership and directions of the government also lead and organize promotional activities and provide resources that can help build the necessary culture for the use of IT.
• Becoming success of applying IT in education depends on the successful IT in education is multi-level leadership in school, the support of school level and teachers as practitioners of appropriate pedagogies.
• The use of IT should be restructured and made more easily understandable in teaching and learning processes.
• The success of IT in school depends on IT implementation plan and how flexible it is for the learner’s and teachers.

3.7.2 The Information Technology (IT) in learning and teaching
• The importance of IT for students in internet-based learning is exploring their idea to others and collects information.
• IT is also helpful for the teacher for preparing tests and assignment for the students.
• IT assists for interaction between schools, teachers, students and their parents.
• Multimedia resources can be interesting for the students to learn and help to explain abstract phenomena.
• IT is useful for teachers to focus clearly on valuing student-centered, inquiry oriented learning and curriculum innovation as exciting pedagogical practice.

3.7.3 IT based learning and teaching strategy
• Infrastructure: Emphasis on the development progress of IT in terms of networking and hardware installations in the school
• Teachers’ professional development: Training is necessary for teachers to improve their skills in IT.
• Education resources: Adaptation of applications and make available of education resources to support learning and teaching
• Teaching methods: Need to practice IT for teaching skills.
• Students’ usage of IT: motivate and encourage students of using IT in their habits and frequency, which make their basic IT-related knowledge and skills at different learning stages.

3.8 Improvement of learning

In the term of improvement of learning, we focus on the learners’ behaviors in their ability of learning. Development of learning abilities and purposeful behavior based on degrees of: analytical-specific perceptual skills and learning potential as measured; the identification and standardization of bilateral electro dermal parameters of learning abilities and disabilities; effects of psycho physiological treatment of learning disabilities (Mangina, 1993). In learning, children try to solve problems more than adult like strategies, because children like to practice with similar problems over time. So, children’s learning and particularly developmental change in the learning process (Kuhn, 2006). Learning by doing is an approach of action learning in the process of reflection and action. It focuses on learning and implementing pragmatic solutions to improve effectiveness of action and important learning outcome (Bourner, Beaty, Lawson & O’Hara, 1996; Sandelands, 1998). The era of electronic
publishing has offered vast opportunities for self-managed learning, and learning through the internet offers an entirely new horizon with virtually unlimited boundary (Koo, 1999).

The uses of technologies enhance learning in the way of development as the view in the attention and contribution of technologies, which can offer educational advantages independently of the individuals engaging with them for specific purposes (Derry, 2007). In order to improve learning, teachers must train students in the new skill that they need as an important additional role to be more adaptable, confident and ready learners (Downs & Perry, 1984). Learning is invited and transformative participation that the implications of the global e-revolution. Communication is essential for learning and the concept of learning could be worthy of even more profound treatment, so learning for development is a part of development matters (Kontinen, 2010).

Most of learning improvement is based on the mechanisms of skill acquisition that measure performance improvement in the terms of cycle time reduction as the result of the learning process, which predicted by the learning curves (Vits & Gelders, 2002). Learning curve framework integrates the cognitive and the physical dimension of performance that improves students’ learning (Zorgios, Vlismas & Venieris, 2009). Learning challenges increasingly learning behavior of a production process as components involve a series of production devices, a number of operators and the management to control the situation (Vits & Gelders, 2002). The use of internet is more widely in academic institutions to support the learning and teaching activities of students and academic staff (Broad, Matthews & Shephard, 2003). Teachers, supervisors and training staffs are essentials for the development of learning skills, which meant thinking about learning. Because they can see the different sources like internet and the process of teaching to identify learning skills through product teaching, and provided appropriate techniques are used (Downs & Perry, 1984). Computer network study project found in their survey, technology has had a significant impact on student performance, attitudes and behavior (Anonymous, 2000). Technology-based learning environments in high school education attempts to bring students together from different locations to access online resources, scientific thinking, online discussion, using scientific explanations, and evidence of their own experiences to improve their learning (Fischer, Troendle, Mandl, 2003).

3.9 Internet for learning

Internet-based learning has changed the way of students’ learning (Liao & Hsieh, 2011), and a direct and an indirect effect perception of ease of use increased learning productivity (Preacher & Hayes, 2004, 2008; Liao & Hsieh, 2011). Social influence is critical and related with internet-based learning. And the research of Liao & Hsieh (2011) found that social influence had a positive direct effect on perceived playfulness, satisfaction, and performance expectancy. They also stated that internet-based learning should increase students’ satisfaction and performance expectancy with learning. Hakkinen (2002) argued that computers can play a central role in re–structuring social interaction and knowledge construction. It is important to understand better the relationship between technology, pedagogy, and student learning (Windschitl, 1998).
Nowadays, the internet is necessary for distance learning to let students have opportunities for education in anytime and anywhere. Hofmann (2002) suggests that internet-based learning offer students to become active learners and more effective than classroom learning. Online learning environments are learning network to help participants develop their competences by sharing information and collaborating, as a social network is comprised of people who share roughly similar interests (Sloep & Berlanga, 2011), to acquire their competences. Koper (2009) points out the inhabitants of a Learning Network as: Exchange experiences and knowledge with others; Work collaboratively on projects (e.g. innovation, research, assignments); Set up working groups, communities, discussions, conferences; Offer and receive support to/from others in the Learning Network (e.g., questions, remarks, etc.); Assess themselves and others; find learning resources; create and elaborate their competence profiles. Drawing on a wide variety of forms of networking, education should be moved out of shared public facilities to home and commercial-base learning (Hayes, 1998).

In fact, the internet will be a major source of continuing education in the near future. Computer driven interactions will also be a regular part professional that will help learners built new associations, find new opportunities, and independence, to learn at home or in the workplace (Spier & Buschel, 1999). The use of internet can promote self-learning to offer a rich selection of learning experiences that are suitable to the needs, pace, space, aspirations and learning methods (Phil, 2005). Global network processes of the internet are increasing that present opportunities and challenges for higher education in learning (Macharia & Nyakwende, 2011). Teenagers are more skilled of using technology tools in learning than adults (Paris, Robert, Charlotte & Troy, 2010). They also stated that almost teenagers and their parents believe that the internet has huge potential to improve study habits and schoolwork, because a virtual reference library helps them quickly locate information, communicate with friends, and satisfy curiosity.

Internet Support Learning is most successful when there existed a redesign process incorporating feedback, outperform traditional delivery methods with the same content, and adopt adult learning styles. It also includes being more self motivated than the traditional student (Bekele & Menchaca, 2008). Nowadays, the internet is becoming more widely used to support learning and teaching activities for students and academic staff. It is an array of issues that are currently supported through a formal and developing regulatory framework and distribute information within the organization, as well as to a wider global audience (Broad, Matthews & Shephard, 2003). It also makes available the study materials in worldwide and creates a much more open learning environment for students and academics for accessing online learning resources. Internet-based learning environment allows the students to use internet for submitting their assignments as a vehicle and academic staff read students work for assessment or feedback and in many circumstances student work is available to other students for peer review (Broad, Mathews & Shephard, 2003). In addition, the people with cognitive or visual disabilities may not be able to read moving text quickly or the movement causes distraction. Thus, the rest of the part of that page becomes unreadable in that case an effective user agent mechanism within a script or applet in internet allows users to freeze moving content and updates.
According to Sylvia (2000), during the last three to five years, internet usage in education for various successful activities such as information retrieval, reference material and data accessibility increased. The gap in the quality and quantity of information provided between developed and developing countries are decreased; information delivery cost to users decreased by the quickness of delivery not dependent upon distance or time; develop communication and writing skills; increase motivation for learning and self-reliance. The study of Sylvia (2000) also entails that, all countries of the world have extensive programs of internet integration for the education and the majority of the developing countries seek to take part in the global educational community, and the use of the internet is of great importance to them.

3.10 E-learning

E-learning technologies delivered online courses, seminars, discussion forums and other approaches for an innovative way of learning to interact with instructors and other students (Maria Cristina, 2009). According to Awodele, et al.(2011), E-learning is an innovative method for delivering education electronically and interactive learning environments for anyone, from anyplace and anytime by utilizing the internet and digital technologies. E-learning also involves through the use of ICT infrastructures.

According to Frisen (2009), e-learning is an educational system for providing learning through electronic technologies especially the internet. The e-learning system lecture materials and other information are available on different platform like CDs, DVDs and smart devices along with audio and video presentations which makes learning easy for the students. E-learning brings a community of learners together and unrestricted by the time and place where students are able to discuss with other fellows and teachers via online and gather different types of knowledge from the different discussion forum (Friesen, 2009).

Most developing countries are very low level of e-learning resources available for students, like the tradition learning mode, and the student’s assimilation is limited. Developing country likes Nigeria, there is very few universities are currently carrying out their academic activities through ICT. The e-learning is still a far-fetched dream there because of very poor ICT infrastructure which is inadequate for e-learning (Awodele et al., 2011). Another developing country likes Bangladesh where e-learning education system is the introduction of new technologies as ICT infrastructure, skilled teacher, traditional course design etc. Although the main purpose of e-learning system introduction for all community people of the society but the real scenario is only the privileged community people of the society are getting the benefit of this learning system due to the existing infrastructure, national strategy and social condition (Akbar, 2005). It also includes that it will bring integrated benefit to the society, if e-learning system can introduce with better learning materials and good ICT based technology then more students will be enrolled and outreach will go further.

Siemens (2004), categorizes e-learning are as follows:

- Informal learning is the most promising aspect of learning where learning is acquired from the surrounding environment. About e-learning system learning from different
search engines (like Google, yahoo), information storage tool (like Furl) and personal management tools like wikis and blogs support of informal learning.

- The blended learning concept comes from both classroom learning and online learning where the materials related to class lectures are available in online which support to reduce classroom time.

- Community learning means the learners with same beliefs, share their knowledge and ideas with each other such as a group of people having the same school of thought, sharing their ideas within the common platforms.

- Learning Networks with the same community of people or same groups within a certain field or same resources the learning network can be from where the basic components are personal knowledge management and the learners acquire adequate knowledge of their field.

- Work-based Learning, in work-based learning system, electronic performance support systems and workflow learning provides information when necessary. It requires significant investment for the creation of the resource and its usability.

- Fully Online Learning-In fully online learning system, learning can be acquired via the internet without going physically to the classrooms, where the learner can be the part of virtual classrooms but not a physical classroom.

### 3.11 Limitations of internet use for Learning in developed and developing countries

All of developed countries use new technologies to help the educational institutions for learning development as e-technologies. Particularly, the emphasis is made by e-learning which can be incorporated into online for effective teaching and learning era (Coldwell, Craig, & Goold, 2011). Whereas most of the developing countries, the e-technologies have not permeated to a great extent in many higher learning institutions (Sife, Lwoga, & Sanga, 2007). In this section, we have discussed the limitation of internet usage for learning improvement in developing countries compared with developed countries in terms of internet based course design, technological limitation, Computer Literacy and Culture.

#### 3.11.1 Courses

Most of the developing country course management of internet based learning is associated with different threats. The course design is managed by the experts of the other countries which are considered to advance quality courses but the knowledge level of the learners are not appropriate for the courses because the courses are not designed according to their cognitive skills and knowledge. A national survey was conducted in Australia and found that more than three-quarters of the graduates from Australian universities and technical schools are not well-matched to the jobs they applied for because of their lack of creativity and flair, oral communication skills, problem-solving ability and interpersonal skills (Teo & Wong, 2000). Another problem, there is a lack of skilled teachers in particular subject areas in
developing countries. On the other hand, in E-learning environments somewhat the course designing is different from the lessons in traditional classes, so it is better to adopt new strategies in course management for the students of developing countries.

3.11.2 Technology

Luhmann and Schorr (1982) argued about technological approaches in education, which emphasize the constraints inherent in the system have to be understood and considered in any attempt to foster serious change. Russo, Campbell, Henry & Kosinar (1999) includes some constraint of internet based learning are lack of text reliance, lack of social interaction between students and teachers, time lags between problem send to the tutor and learners answer receiving process. They also stated that, most of the internet based programs consist of only text, a lean medium, more integrated audio and video system, unlike to face to face studies and technical difficulties for the new user. In developing countries one of the biggest limitations for implementing E-learning is technology. Also there are some barriers to transferring knowledge in developing countries are infrastructure, technology access, internet access, maintenance of technology and usability (Kohn, Maier, Thalmann, n.d ).

In terms of infrastructure, most of the developing countries are shortage of electricity and poor condition of landline and broadband connection is the major problem for implementation of E-learning (Kohn, Maier, Thalmann, n.d). The privatization is another obstacle for some of developing countries even when the infrastructure is available. In developing countries lack of appropriate software and hardware, and insufficient technology becomes a big hurdle because proper technology is not available in the schools as well as in homes (Kohn, Maier, Thalmann, n.d). The biggest problem is that without internet connection the concept of E-learning would not be feasible, but the internet is available only cities and towns in developing countries with limited bandwidth. Also there is a shortage of skilled people for E-learning system; if any problem occurs in that system there are very few people who are able to fix the problem. Another difficulty of the internet based learning in developing countries is the rapid changes of technology which causes the changes of infrastructure.

3.11.3 Computer Literacy and Culture

Computer literacy is one of the biggest barriers for implementation of E-learning in developing countries because the students don’t know how to use it as well as the availability of computer for the students. According to Kohn, Maier, Thalmann (n.d), the acquisition of E-learning systems, it is necessary to have good knowledge of the computer, but in developing countries computer literacy is generally low, this is also a barrier for E-learning. All most all of the developing countries, the people do not understand the meaning and functionality of an E-learning system which causes significant problems for the adoption of E-learning.

According to Hofstede (2001), culture is the collective programming of the mind that distinguishes the members of one group or category of people from another. Culture includes beliefs, ideas, languages, rules, procedures and norms (Kersten, Matwin, Noronha & Kersten, 2000). For the growth of E-learning is not possible because of the people’s mindset and lack of awareness. Developing countries like Saudi Arabia, though the infrastructure is available
and there is no problem in the acquisition of technology but the culture creating obstacles in the implementation of E-learning. Only because of some cultural factors females have some restriction for achieving adequate education in some developing country.

Language is most clearly recognizable part of culture and all of the software and learning material are available in the English language and the people who do not have good educational background have difficulty with the English language (Kohn, Maier, Thalmann, n.d). According to Muwanga-Zake (2007), most Web content are in English and fact the low level of language skills in developing countries which can lead to misunderstandings such as the term ‘mouse’ which in ordinary English indicates an animal had to be translated to reflect a computer device. Another problem is that some societies have their own traditions, for example they feel that the media will spoil their morals, therefore they do not want to get media based learning. According to Kohn, Maier, Thalmann, (n.d), interaction is a mixture of ideas, rules, procedures and norms and it is another limitation for E-learning. Some students feel hesitate to interact with others even feel shy to interact with teachers because of their family and society traditions. The concept internet based learning is the interaction of students and teachers is very limited, therefore students are unable to understand this system and sometimes do not want to adopt it.

### 3.12 Human Computer Interaction (HCI)

Human computer interaction is an interaction between computer and people, which include both the software and hardware for study, planning and design. A human can interact with computer for various purposes, such as information sharing, daily works etc. The interaction between human and computer is making our life easier and comfortable. We can define human computer interaction in many different ways. According to Denning, et al. (1988), “Human Computer Interaction (HCI) as the relationship between people and computers base on system to interact with each other that concerned with the efficient communication between humans and machines via various human-like sensors and motors, and with structures that reflect human conceptualizations”. Martin, et al. (1997) stated that “Human Computer Interaction (HCI) as knowledge of the capabilities and limitations of a human operator is used for the design of system, software, tasks, tools, environments, and organizations, in order to improve productivity while providing a safe, comfortable and satisfying experience for the operator”. According to Harper, Rodden, Rogers & Sellen (2008),“Human Computer Interaction (HCI) refers to the understanding and designing of different relationships between people and computers that the main concern of HCI was ‘usability’ in the late 1970s, and then, HCI has established an impressive track record for developing and applying all manner of design and evaluation methods to ensure that technologies are easy to learn and easy to use”. HCI was adopted in the mid-1980s as a means of describing this new field. This term acknowledges that the focus of interest was broader than just the design of the interface and was concerned with all those aspects that relate to the interaction between users and computers (Preece, et al., 1994). “HCI is a discipline that concerned with the design, evaluation and implementation of interactive computing systems for users and with the study of major phenomena surrounding them”(Hewett et al., 1992). Preece, et al. (1994) stated that “Human-Computer Interaction is about designing computer
systems that support people so that they can carry out their activities productively and safely”. So the goal of Human-Computer Interaction is to make the system safe and usable by understanding the factors how the people use technology, tools and techniques for making the system effective, efficient and safe interaction.

3.12.1 Human information

In fact, the field of human computer interaction (HCI) interlinks with interface design and human factors which have made significant contributions to ease of use. These are primarily concerned with the users’ interaction of the system, not with the structures that are often more fundamental for designing truly human centered systems (Jiajie, Patel, Johnson & Smith, 2002).

However, the field of Human information system is concerned with Human Computer Interaction (HCI) which are interested in successful systems design, evaluation, technical dimensions of work and involves human acknowledgment, in order to understand design approaches how the system should perform an analysis of human needs (Balbo, Bentley & Collings, 2007). They also stated that the field of knowledge in Information Systems (IS), Psychology, Graphical Design, Sociology, Computer science and Ethnography, are drawn by Human Computer Interaction (HCI). Thus, the increasing of technology usage nowadays is challenging to understand human needs within the system, products and interactions. In order to develop an optimal system a common goal shared by HCI and IS that need to understand both of the human and technical aspects.

When humans communicate with each other at the outside world, they use a system of highly complicated mental processes that the senses provide inputs from eyes, ears, nose, mouth, and from sensors in skin on other parts of the body. And the information is continually fed to work in short-term memories in consciously or unconsciously to sort and classify transferring much of it into long-term memories to be remembered outright processing further (Wiig, 2004).

- **Short-term memory**

Human memory is the key for the understanding of the underlying biology and for the short-term memory processes. Human short-term memory refers to ability to remember information over a brief period of time (Papassotiropoulos, et al., 2011). Short-term memory is considered to be the center of consciousness to explicit reasoning takes place in working memory at the top level of attention. Maljkovic and Martini (2005) stated that short-term memory as independent factors that arousal influences dramatically in faster accumulation of memory, and valences has a more interesting effect as the view of information and neutral scenes accumulates in memory at the constant rate. They also stated that information accumulation in short-term memory is a controlled process modulation by valence and arousal.

- **Buffer memory or medium-term memory**

Buffer memory is medium-term memory which stores a large number of mental objects to have worked with during the last several hours in working memory that easily accessed and
easily forgotten as well. And buffer memory is required to explain human professional work functions (Wiig, 2004). Action buffer memory denotes the memory functions for the output-oriented actions, skills, and behaviors, such as a sequence of movement and a pre-prepared verbal sentence, which are interconnected with the motor servo muscles (Wang, 2009). Retrieving memory objects from buffer memory is easier and quicker than obtaining them from long-term memory, but this intermediate memory is typically no longer available and must be retrieved from long-term memory (Wiig, 2004).

- **Long-term memory**

According to Ragland, et al (2009), Long-term memory is a multifactorial construct, composed of different stages of information processing and different cognitive operations that are mediated by distinct neural systems. Long-term memory stores information and knowledge as mental objects for long periods of time that have capacity for things to be remembered. It is located throughout the brain, presumably in the areas where the various functions of vision, speech, and so on. However, the memory objects stored in long-term memory are not directly accessible but must be accessed by activating working memory (Wiig, 2004). The short-term retention of information can be supported by the temporary reactivation of long-term memory representations (Lewis-Peacock and Postle, 2008). Therefore, the goal of learning is to help students store information in long-term memory and use information to solve efficient problems. The cognitive resources of a human agent include prior knowledge, which is stored in long-term memory (LTM), and intentional resources, which include working memory (Coiera, 2003).

### 3.12.2 Computers

Computers are electronic machines which help people to calculate, simulate, store different scenarios and interact with each other by communication. And computers are universal information processes in the form of electric signals that use light processing, or biochemical mechanisms similar to that of living organisms (Semenov, 2005). According to PICCININI (2008), computers have computing mechanisms with a control unit that involve long sequences of primitive operations on strings of digits, operations. These can be performed automatically by the computers’ processors, as likes calculators of large capacity to perform a few computational operations on the inputs of bounded. Computers can be modified to compute in different ways that can do arithmetic, graphics, word processing, internet browsing and myriad other things. And computers are made out of four types of components such as: input devices, output devices, memory units, and processing units (PICCININI, 2008), that describe in the figure3 in the next page:
The processing units are called processors that can analyze a combination of data paths and control unit. Computers’ processors are capable of branching behavior and can be set up to perform any number of their primitive operations in any order, which data operation is performed by inserting through an input device (PICCININI, 2008). The processor can only receive a finite number of instruction types corresponding to the primitive operations, and all the operations performed by the processor in response to these instructions can be functionally characterized as operations on strings (PICCININI, 2008).

Computers’ memory units can be increased in a modular fashion with storage space required so they are orders of magnitude larger than ordinary calculators, as hold the data, and possibly intermediate results, until the operation is performed (PICCININI, 2008). When a processor executes instructions, memory registers for instructions and data are functionally identified by the addresses of the memory registers that contain the data or instructions. Computer programs are stored in memory as a list of instructions placed in appropriate memory registers, and can store strings of digits in the internal memory that contains at least one processor (PICCININI, 2008).

Input and output are generated by computers by physical devices external that must be able to permanently store, read and present data which traditional models provide only by examining initial and end state (Gerber and Leeson, 2004). Computers have the function of generating output in accordance with a general rule whose application depends on their input, that the operations are performed by computers to define over inputs and outputs. The semantics of computer’s input and output is helpful in understanding how computers are used, but it is unnecessary to individuate computing mechanisms and the functions they compute (PICCININI, 2008).

Nowadays, personal computers (PCs) are constantly increasing their potential power as well as of software functionalities. The present human computer interaction techniques are almost identical to those employed decades ago. The technology is relatively mature to be new style solutions for interaction with the machine, as human sensing capabilities (hearing and sight) can be incorporated into traditional Graphical User Interfaces (GUIs) and enhance users’ dialog with the computers, and natural communication with the machine is becoming a reality.
as interaction with PCs can trigger specific actions (Porta, 2007). Computer input devices consist of mouse, keyboard, modem etc.; Output devices consist of screen, printer etc.; Central Processing Unit or CPU as the brain of the computer which controls all calculations, manipulations and output; Memory (RAM) as temporary storage to be used by the CPU when doing calculations and it.; Disk (storage) as permanent storage which all the software and data is stored (www.sikh-history.com).

Computer software is some kinds of instructions that drives computer about what to do, which encompasses the complete set of instructions, programs, routines and procedure for operating the computer system (Software, 2012). The computer software system is mainly two types: system software and application software, computer’s internal functionality are controlled by system software through an operating system and also peripheral devices like keyboard, mouse, printer, monitor and storage devices. So, computer software programs are set of instruction which direct hardware to perform a specific task.

Computer operating system (OS) comprises the set of instructions and continual process management which controls the computer's resources in order to execute application software and perform tasks and without an operating system, the computer systems are useless. Computer operations are coded programming which can be permanently stored on chip (ROM) and/or programming information that can be permanently or temporarily stored on or executed from a chip, disk drive or other dynamic medium and the operating system creates the environment that supports applications (Software, 2012 & John, 2008). The operating system also manages input information’s from keyboards, mice, communications ports, etc., and outputs information to destinations through graphical displays, printers and communications ports and maintains storage drives and retrieval of program information and application data.

Application software directs the computer to execute commands from the user and processes data for a user, which includes word processors, spreadsheets, database management, inventory and payroll programs, and many other “applications. Application Software is a set of programs that allow the computer to perform a specific data-processing job for the user and utility software managing system resources and helps to keep your system in shape by eliminating/correcting errors (Software, 2012).

3.12.3 Usability

There are lots of applications for interacting with human and machine, such as image processing, speaker recognition/identification, web applications etc. Usability means how these applications are effective, whether the user can use it smoothly without any problem, or is there anything needs to be added for further development of that application. So, usability is the process of testing with a handful of techniques to gain learn-ability, efficiency, memory ability, less errors and satisfaction (Nielsen, 1993). And it is the result of efficiency, attitude and learn ability as a key concept in HCI that concerned with making systems easy to learn and easy to use (Cronholm, Ågerfalk, & Goldkuhl, 1999). According to Chou & Hsiao (2007), usability expresses the relationship between end users and computer applications as inherent in human–computer interface. It is defined very well in human computer interaction
(HCI) research that refer to the extent to which the user and the system can communicate clear understanding through the interface. Goodwin (1987) defined usability as the compatibility of the system with the users’ cognitive characteristics of communication, understanding, memory and problem solving. According to Zimmerman and Muraski (1995), usability is how well of user interact with technology to carry out the assigned activity. Chou & Hsiao (2007) stated that learning and using computers of young adults are the one of the important groups in usability research on the human computer interface. And learning behavior toward present computer hardware and software interfaces is an important issue for cognitive scientists, educational psychologists and ergonomists. They also stated that usability analysis can help researchers to understand better interface user behavior to be a better designed computer interface resulting in more efficient and less error-prone usability.

• **Usability test**

Usability test is managed by observer who understands the products well, and participants should represent the target audience. And they should use realistic tasks that potentially expose problems in real situations (Kantner, 1994). The strategy of data collection for usability test conducted in two parts as developing usability test questions and developing a data crosswalk (Rojek and Kanerva, 1994). However, since the cost to conduct usability tests could be expensive, it is important that the benefit outweigh the cost (James, 2006). The goal of usability test is mainly to discover problems with the current website and to get feedback from users. The result of the test will help web developers understand more about what the user needs and to improve the website accordingly (Granic, Mitrovic & Marangunic, 2008). According to Rubin, Chisnell & Spool (2011), usability test refers to a process where people as representative of the user evaluations whether a product meet usability criteria.

### 3.12.4 User Interfaces

User interface is the interaction between human and machines in effectively and efficiently that concerned with HCI in human factor at the interface greatly influence learning and users’ performance (Novick, 1982). Young (2010) stated that the future generation computer based systems will need cognitive user interfaces, and cognitive user interfaces will be characterized by the ability to support inference and reasoning, planning under uncertainty, short-term adaptation, and long-term learning from experience. The user interface is the aggregate of means by users’ interaction with a particular machine, device, computer program, that provides allowing user control the system (Input) and system informs the users or feedback (Output) (Blair-Early & Zender, 2008). They also defined user interface as the means by which users interact with content to accomplish some goal. Human factors analysis required for the user-interface design as user interface needs to be designed that depends on information integration (van Westrenen, 2011). According to Wohl (2005), three categories of interfaces are used in a host for different tasks, and these are the browser interface, special purpose interface and variety of interfaces.
• **The browser interface**

The general purpose interface used for internet searching, which include a standard bar where you can insert web address for searching and additional navigation tools and application are appearing within this framework. Most of the traditional applications used browser interface like word processing and spreadsheets used within companies for specialized applications, such as: inventory tracking and for repetitive tasks, like filling out forms. Within the browser interface, users can move easily from one computer to another and one of the major benefits of browser interface is most of the machines already have some kind of browser installed. So, you don’t need to have specialized software to run applications stored on a remote server.

• **Special-purpose interface**

Special-purpose interfaces are used for navigating large collections of information as the Web. It is very difficult and time consuming to navigate large collection of information and users can do this easily by crawling the Web with a search engine to assembling mixed-media collections of documents, databases, audio, and media.

• **Variety of interfaces**

Some of the established and new companies used a variety of interfaces for managing their own collections of information. A number of companies have been working on 3-D interfaces, which allow more flexibility in displaying information, permitting the images. And these represent information to look more natural, letting them rotate in space or overlap with transparency and dimension as clues to their position in space and size (Wohl, 2005).

• **User interface design**

According to Savidis, Akoumianakis & Stephanidis (2001) and Savidis & Stephanidis (2004a), User interface design is a hybrid process-oriented design method which enables the organization of diversity-based design decisions around a single hierarchical structure. The purposes are to cater the management of an evolving design space, in which alternative design artifacts can be associated with variations of the design problem parameters, and the method addresses the following main objectives (Antona & Savidis, 2006):

- User interface design enables to alternative design that required for adaptation into a single user interface design space to produce during a single design phase of collective design.

- For alternative design artifact user interface is documented implementation facilitates including the run-time relationships with the rest of the artifacts within the same design context as well as the specific associated problem parameter values.

- User interface design support evolution design which enables the effective extension of different design contexts by addressing new user- and usage context attribute values.
3.13 Communication

Communication is an activity of sharing ideas and information with each other for understanding to do the tasks, as the activity conveys information in words each other with interaction of meaning to share, and communication process is complete once the receiver has understood the message of the sender (Wikipedia, 2012). Communication is a process in which two or more people share the same meanings (Yahn, 2001). Communication helps education and learning process to determine negative changes in behaviors and expressing ideas in mind as well as affecting others (Karadag & Caliskan, 2009). Communication is important and necessary for everyone should communicate through interaction in the reliability of the sources as when people receive messages from the source and then send the feedback. In fact, they complete the process of interaction even without other supportive messages, so communication is more important for education to improve learning because the learning - teaching process cannot work without communicating (Karadag & Caliskan, 2009). In short non-verbal communication is also important in the process of teaching and learning (Çaliskan, 2003). One element of communication is based on cultural sources that interact communication brings a shared common area out of different cultures to make teaching and learning process more active and enjoyable (Karadag & Caliskan, 2009). The internet is very efficient mechanism to increase distribution of information within the organization, as well as to a wider global audience (Broad, Matthews & Shephard, 2003). Therefore, internet usage can be good communication of new information technology to enhance students’ learning in effectively and efficiently. Thus, communication is very necessary and important for interaction of learning by exchanging and doing some activities of the learning improvement sector.

Verbal communication is a form of cooperative and concerted activity to establish sharing our understanding, culture. It also concerted action by means of mine, collective, shared make-believe, teaching and subsequent exploiting of perceptual abilities, empathy, and the use of objects and graphics for communicative purposes (Melser, 2009). Thus, verbal communication is the way of communication and interaction between people by face-to-face, as the key components of sound, words, speaking and languages (Cobweb2, 2012). According to Melser (2009), verbal communication is often used for conforming the actions of a follower to the reader, as a technique for synchronizing and integrating people’s actions, including their perceiving and imaginings. However, leader’s simply doing what he/she is doing conspicuous may be enough to let audience following suit. Therefore, verbal communication is necessary to improve and practice for good communication. Stern (1993) stated that verbal communications are also important for internal auditors to improve oral communication skills in their business, that organizations have been enhanced through training from the sales staff to improving communication and public speaking skills with their customers.

Nonverbal communication is the communication through sending and receiving wordless by messages, gesture, body language, including material to be understanding with each other between peoples’ interactions. As being a fundamental aspect of communication, meaning is used mostly unconsciously but continuously (Demir, 2011). Attitudes, emotion, identities, movement, clothing, eyes and face, gesture, distance, touch, etc…. These are the relational
levels of meaning and the nature of the relationship between communicators in nonverbal communication (Chang, 2006). Nonverbal communication was developed as teaching student to be an active learning exercise to illustrate how instructors might incorporate thinking into courses that generally focus primarily on students’ learning (Schwebel & Schwebel, 2002). And students have enough time to complete their exercise more effective thoughtful answers were obtained (Chang, 2006). Therefore, nonverbal communication is also necessary for network communication and education as a key factor in effective teaching in all subject areas (Battersby, 2009).

### 3.14 Interaction Design

According to Hallnäs & Redström (2006), “interaction design is a kind of design which shifts focus from what a thing does as we use it to what we do in the acts that define use and from the visual presentation of spatial form to the act presentation of temporal behavior”. Interaction design is a basis for designing interaction with computer-based systems which are elements of graphic design, information design, and concepts of human-computer interaction, though computers are at the center of interaction design, it is not a subfield of computer science (Winograd, 1997).

Interaction design means that designing interactive products to support people in their everyday life and create their experiences that enhance and extend the way people work, communicate and interact (Preece, Rogers & Sharp, 2002). It concerns with HCI to be a necessity field with interdisciplinary interaction. It also includes people and machines, virtual worlds and computer networks, and a diverse array of objects and behaviors (Hallnäs & Redström, 2006). Interaction design deals with service to adapt user needs and preferences to complete new kind of design to determine a communication service for users as quality of experiences that they interact with using it (Thackara, 2001). Interaction design refers to the process of existing resource constraints to create, shape and concerns with digital artifacts to decide all use oriented for clients, as the most challenging aspects (Löwgren and Stolterman, 2004).

Ronchi (2009) stated that interaction design as the design of interactive products that are able to support humans in their own working activities and in everyday life. The users deal with many interactive products in a typical days: mobile phones, computers, remote controls, soft drink machines, coffee machines, ATMs, railway and bus ticket machines, the Web, photocopiers, alarm watches, digital cameras, camcorders, printers, iPods, etc… Interaction design focuses on constructing the ways people interact with objects and systems. The product of interaction design is almost entirely the quality of the user’s experience, and the level of an individual user will be an ambiguous or subjective process for the designers (Crampton Smith and Tabor, 1996).

Interaction design also includes technical, biological, environmental and organizational systems to the specify context and dynamics of user experiences (Candy & Costello, 2008). Interaction design requires techniques and skills to understand what people want to achieve during their interaction of products, because other skills enable designers to clear define the
means by digital system communication with users and how they interact with system (Elizabeth, 2005). However, Human Computer Interactions (HCI) were required for the previous generation of computer application, and interaction design involves much more than analyzing HCI, as defining the behaviors of artifacts, environments and systems (Ronchi, 2009). The interaction design process can be principle of an organization or large population perspective (Coiera, 2003), to develop interactive systems that elicit positive responses of feeling at ease, being comfortable, and enjoying the experience of using, from users (Ronchi, 2009).

The challenging of interaction design is to consider include the constraints that a context of use imposes, requirements that must meet business goals, and design patterns that derive from usability principles (Elizabeth, 2005). Usability is a key element in interaction design (Candy and Costello, 2008), and usability research focuses on the functional aspects of user experience. So, usability researchers should look towards creative practice design to find alternative methods that might more creative and innovative design solutions (Greenberg and Buxton, 2008).

The aim of interaction design is to close this gap by bringing usability into the design process, and interaction design also develops interactive products to be easy, effective and enjoyable for users. It involves cognitive, social and emotional aspects, and proposed solutions are taken from various fields, ranging from psychology to computer science (Ronchi, 2009). Therefore, interaction design needs defining clear language for its tools and methods, to understand and empathize with people, as well as to communicate complex design solutions to a target audience (Elizabeth, 2005). So defining of interaction design should be built with the products as base on the process (Ronchi, 2009):

- Understanding interactions
- Understanding potential users
- Having a clear idea about how interfaces may influence users
- Identifying user’s needs and requirements
- Applying a user-centred design process
- Design, prototyping and digital mock-ups
- Evaluating and assessing the results.

Designers need to be interested in how to design interactive products that elicit specific kinds of emotional responses in users, motivating them to learn, play, be creative, and be social (Ronchi, 2009). Interactive mobile systems have required a profound rethinking of the main concepts in designing and developing, which systems can be accessed in many contexts of use through a wide variety of interactive platforms, and the ability adapts to them should be provided with tools for design (Paternò, 2003). Designers will attempt to ensure that the experience of the product will be remembered by the user, and also extended in time and space, with the ultimate aim being continuous feed (Ronchi, 2009). Information technology is a necessary part of people’s life in around them all the time and everywhere as in cars, in the streets, in homes, in the universities, in the phone, in the music instruments and etc…. These
Thomassen and Ozcan (2010) conducted with students in multidisciplinary design teams that required, strategic and critical thinking, multicultural collaboration. And the cultural exchange guided them to develop an understanding of the translation of art-history and interaction design. So interaction design concepts created on the foundations of traditional study phenomena and culture that lead to innovative thinking shared by different groups.

Identifying user’s needs and requirements concern with the designing user interface, which should help users formulate their queries, refine their searches, understand and examine search results (Peters, Braschler & Clough, 2012). Designing the user interface also involves the localization of existing material and services, base on user centered design approach. It focuses on the needs of the end users in an iterative cycle involving identifying users’ need and establishing requirements (Rubin, 1994; Preece, Rogers & Sharp, 2002). These are built to meet users’ needs and their individual characteristics are investigated as part of the development (Peters, Braschler & Clough, 2012).

3.15 Summary of theoretical findings

Regarding to our implementation of theoretical study that related internet usage for learning improvement, so we can summarize the finding that proper linked with the appropriate research questions is established.

Sub-question1: What are the relationships between internet usage and students’ learning?

The use of internet has the positive effect with students’ learning that it can change their learning situation, perception and competences to be better. The internet is also very necessary for distance learning to communicate with each other by sharing information, experiences on network around the world, and everyone has opportunities to study at anytime, anywhere with online whenever they want. Technologies facilitate new forms of real time interaction with two-way videoconferencing, or one-way video and two-way audio communication, empowers the joint exploration of the delivery mechanisms, adding stronger collaborative learning elements. Internet-based learning had a positive effect on perceived playfulness in social influence which increases students’ satisfaction and performance expectancy with learning. Therefore, internet usage has the positive relationship with students’ learning. Internet usages can increase communication and interaction to improve their learning activities easily and efficiently. However the positive effect of internet usage and learning are not strong relationship (See in chapter 3.5, 3.6, 3.8&3.9).

Sub-question2: Can internet usage improve students’ learning?

Learning acquires new, or modifies existing of knowledge, behaviors, skills, abilities, preferences and involves different types of information sharing or exchanging with each other. Electronic network helps students for searching huge of information in more effectively and efficiently to enhance and update their learning skills. The use of technologies enhances students’ learning, particularly internet usage can improve their competence, ability, skill and
self-managed learning. Because the internet let them have opportunities to interact with each other easily, effectively and efficiently for learning, so internet can increase learning by doing or action learning (See Chapter 3.5).

Distance learning is a procedure of remote learning where teachers and students are far from each other and students can study by themselves without physically meeting in the classroom; they don’t need to go to schools or universities. Nowadays, internet usages open new generation distance learning system where technology empowers the joint exploration of the delivery mechanisms of previous generations; adding stronger collaborative learning elements; alternatives became available to many students (See Chapter 3.6).

The era of electronic publishing has offered vast opportunities for self-managed learning, and learning through the internet offers an entirely new horizon with virtually unlimited boundary. The uses of technologies enhance learning in the way of development as the view in the attention and contribution of technologies can offer educational advantages independently of the individuals engaging with them for specific purposes (See Chapter 3.8).

Internet-based learning has changed the way of students’ learning, direct and indirect effect perceptions for ease of use to increase learning productivity. Online learning environments are learning network to help participants develop their competences by sharing information and collaborating. The social network is comprised of students who share roughly similar interests and students had become active learners and more effective than classroom learning. Internet based learning offer students to exchange their experiences and knowledge with others, work collaboratively on projects, set up working groups, communities, discussions, conferences, offer and receive support to/from others in the learning network, assess themselves and others, find learning resources, create and elaborate their competence profiles (See Chapter 3.9).

**Sub-question3:** What are the differences of internet usage for learning between developed and developing countries?

The developed countries use new technologies to help in the education institutions for learning development. They have a strong online system to be convenient interaction for effective and efficient learning. On the other hand, almost all of the developing countries, the e-technologies have not permeated to a great extent in many higher education institutions because of poor online system. Most of the developing countries are shortage of electricity and poor condition of landline and broadband connection is the major problem for implementation of E-learning. There are also some barriers to transferring knowledge in developing countries are infrastructure, technology access, internet access, maintenance of technology and usability (See in chapter 3.10 & 3.11).

**Sub-question4:** What important design principles can be used to create a more efficient HCI for internet based learning?

The Human Computer Interaction (HCI) is based on the human system, usability and users interface that increase computer system design in the ease of use, effectiveness and efficiency of peoples’ interaction which are easy to learn and easy to use. Good interaction will increase users and users’ satisfaction, particularly in learning improvement base on internet usage. HCI has established an impressive track record for developing and applying all manner of design
and evaluation methods to ensure that technologies are easy to learn and easy to use. The goal of Human-Computer Interaction is to make the system safe and usable by understanding the factors how the students use technology, tools and techniques for making the system effective, efficient and safe interaction for learning (See in chapter 3.12).

HCl concerned with the users’ interaction of the system, not with the structures that are often more fundamental for designing truly human centered systems. It includes successful systems design, evaluation, and technical dimensions of work and involves human acknowledgment. In order to understand design approaches how the system should perform an analysis of human needs. When humans communicate each other with the world outside, they use a system of highly complicated mental processes that the senses provide inputs from eyes, ears, nose, mouth, and from sensors in skin on other parts of the body, and the information is continually fed to work (See in chapter 3.12.1).

Human Computer Interaction (HCI) refers to the understanding and designing of different relationships between people and computers that the main concern of HCI was ‘usability’. Usability is the process of testing handful techniques to gain learn-ability, efficiency, memory ability, less errors and satisfaction. It is the result of efficiency, attitude and learn ability as a key concept in HCI that concerned to making the systems easy to learn and easy to use. Usability research on the human computer interface of young computer learners presents learning behavior toward current computer hardware and software interfaces. It is an important issue for cognitive scientists, educational psychologists and ergonomists. It also can help researchers to understand better interface user behavior to be a better designed computer interface resulting in more efficient and less error-prone usability (See in chapter 3.12.3).

User interface as interaction between human and machines in effective and efficient operation process, that concerned with HCI in human factor at the interface greatly influence learning and users’ performance. User interaction with a particular machine, device, computer program, that provides allowing user control the system (Input) and system informs the users or feedback. The cognitive user interfaces will be characterized by the ability to support inference and reasoning, planning under uncertainty, short-term adaptation, and long-term learning from experience. Therefore, HCI concerned with the design, evaluation and implementation of interactive computing systems for users and with the study of major phenomena surrounding them (See in chapter 3.12.4).

Interaction design provides an interactive design to support people in their everyday life and create their experiences that enhance and extend the way people work, communicate and interact. It concerns with HCI to be a necessity field with interdisciplinary interaction that includes people and machines, virtual worlds and computer networks, and a diverse array of objects and behaviors. The goal of interaction design is to close this gap by bringing usability into the design process. Interaction design also develops interactive products to be easy, effective and enjoyable to use for users, which involves cognitive, social and emotional aspects, and proposed solutions are taken from various fields, ranging from psychology to computer science. Interactive mobile systems have required a profound rethinking of the main concepts in designing and developing. However, Human Computer Interactions were required for the previous generation of computer application, and interaction design involves much
more than analyzing HCI, as defining the behaviors of artifacts, environments and systems (See in chapter 3.14).

3.16 Arguments for an empirical study

The increasing of internet use may reflect to the improvement of learning, and according to the theoretical finding, internet usage has the positive effect with students’ learning. Therefore, we want to ensure what is the positive relationship of internet use for learning and it is necessary to investigate by survey with students. In order to ensure of survey findings that needs to be conducted with developed and developing countries as Sweden and Laos. The empirical study will be implemented with the numerical and statistical analysis to be scientific result that concern with research questions and theoretical finding.
4 EMPIRICAL SURVEY

4.1 Purpose

The empirical study investigates and identifies internet use for learning that how it can improve learning and it will be a good result from analyzing. The theoretical finding indicated that internet usage has the positive effect of students’ learning. Thus, it is necessary to ensure of the scientific research that needs to conduct with an empirical survey of quantitative research (Bryman & Bell, 2011). Our empirical survey was implemented to students in upper secondary school by providing questionnaires to get responding the real situation that they are facing. The survey in the different locations will be good evidence of finding in scientific research.

4.2 Sampling

The empirical survey of this research conducted with upper secondary school students of class year 9 (15-18 years old) between developed and developing countries (Sweden and Laos). Because this sample group, they are oldest students in the upper secondary school to become the adults soon. We believe that they are higher experience of using internet than other to help us have the good answers about their experiences with internet usage for learning. So, we have selected students who can use the internet between upper secondary schools at Engelbrektskolan in Borås (Sweden) and Sathid secondary school in Vientiane (Laos) by non-probability sampling method. We had distributed 110 questionnaires by hardcopy; however we have received the 83 respond answers from students where 75% of respond answers. Thus, our sampling is limited that cover 83 students in Sweden and Laos.

According to Byman and Bell (2011), non-probability sampling is the practice of surveying with an individual as a representative group or person of institution or organization. Non-probability sampling is less desirable than probability sampling because the population is truly representative in non-probability sampling. And the main disadvantage of non probability sampling is the result is not biased. By random selection approximation and eliminating many sources the validity of non-probability sampling can be increased. Thus, in our research is conducted with non probability sampling, we think our result is not biased because the survey questionnaires about the internet usage for learning improvement on the same issue for the same class students in both developed and developing countries, Sweden and Laos.

4.3 Questioners

The implementation of survey questionnaires contain with two sections that based on the research questions. The first section of questionnaires describes about internet usage such as: reasons and experiences of use, spending time on internet includes other information of using, and etc… The second section describes about students’ learning and perception of their interaction between internet usages and learning that includes the result or grades of their study, to compare with their spending time on internet. The questionnaires are multiple
choices and filling the numbers that easy for answers. These are described detail in appendix. The survey questionnaires were distributed by hardcopy to students who have experiences of using internet at the secondary school in Borås (Sweden) and Vientiane (Laos). We have received the responding answers from them after one week later.

4.4 Questioners presentation

According to the survey questionnaires, the responding answers are presented in the chart, diagrams and tables that describes in the number and text below:

![Figure 4: The percentages of survey in secondary school students in Laos and Sweden](image)

After surveying, the responding answers from students show that 47 students= 57% in Laos and 36 students=43% in Sweden, 38 males=46% and 45 females=54%. These are described detail in the above figure4 and table1 below:

<table>
<thead>
<tr>
<th>Survey</th>
<th>Male</th>
<th>Female</th>
<th>Number</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vientiane, Laos</td>
<td>22</td>
<td>25</td>
<td>47</td>
<td>57</td>
</tr>
<tr>
<td>Borås, Sweden</td>
<td>16</td>
<td>20</td>
<td>36</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>45</td>
<td>83</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1: Summary of result for survey in secondary school students in Laos and Sweden
The following table presented questionnaire answers about general personal of students, and their reasons, experiences, perceptions of using internet that they interact with, in Vientiane, Laos and Borås, Sweden.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Survey in Vientiane (Laos)</th>
<th>Survey in Borås (Sweden)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>N</td>
</tr>
<tr>
<td>Students (15-18 years old)</td>
<td>22</td>
<td>25</td>
<td>47</td>
</tr>
<tr>
<td>Have mobile</td>
<td>22</td>
<td>25</td>
<td>47</td>
</tr>
<tr>
<td>Have own computer</td>
<td>17</td>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td>Reason</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watching movies</td>
<td>4</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Communicate with friends</td>
<td>5</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Searching documents</td>
<td>10</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Experienced in internet use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 3 months</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3 to 6 months</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>6 to 12 months</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1 to 2 years</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>2 to 3 years</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>More than 3 years</td>
<td>7</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Useful of internet usage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The least useful</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Less useful</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Useful</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>More useful</td>
<td>9</td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>The most useful</td>
<td>7</td>
<td>6</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 2: General information of internet usages

From questionnaires answers in table2 shows that all of students have mobile phones and 92% have own computers. We found the reason of use that many students like using the internet to communicate with friends and only 14.46% of students choose other reason as to play games, and online shopping. However, students in Borås, Sweden have experiences of internet use, and use internet to communicate with friends, more than Vientiane, Laos. According to students’ experiences of using internet, 73.33% of students think that internet usage is more and the most useful for their learning, but only 26.67% of students think it is useful and less useful.
Questionnaire answers from students in the section of internet usages are presented in the table 3 that describes below about frequently of internet usage:

<table>
<thead>
<tr>
<th>Survey for Frequently of internet usage</th>
<th>Survey in Vientiane (Laos)</th>
<th>Survey in Borås (Sweden)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>everyday</td>
<td>4 or 6 days a week</td>
</tr>
<tr>
<td>on mobile phone</td>
<td>23 11  9 1 0 1 2 2 1 0 1 2</td>
<td>31 5 0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>own computers</td>
<td>6 19  9 2 4 2 5 1 2 3 4 5</td>
<td>21 6 4 3 0 0 0 2</td>
</tr>
<tr>
<td>at school</td>
<td>9 17  7 2 1 0 18 1 2 3 4 5</td>
<td>14 5 5 9 1 1 1</td>
</tr>
<tr>
<td>at internet cafe</td>
<td>1 3  6 8 8 14 7 0 1 0 3 32</td>
<td>0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>at home</td>
<td>21 14  5 4 2 1 0 25 8 3 0 0 0 0</td>
<td>0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>entertainment</td>
<td>14 12  11 5 2 2 1 23 7 4 1 0 1 0</td>
<td>0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>communication</td>
<td>25 15  7 0 0 0 0 29 6 0 0 1 0 0</td>
<td>0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>search engine</td>
<td>10 18  12 2 3 2 0 20 12 4 0 0 0 0</td>
<td>0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Daily internet usage</td>
<td>26 13  5 0 2 1 0 29 7 0 0 0 0 0</td>
<td>0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

Table 3: Frequently of internet usage

According to the survey in table 3, the students like to use the internet everyday as the finding, 55 students=66, 27% use internet everyday, and many students like access internet by their mobile phone. However, the daily using internet of students in Borås, Sweden is more than students, in Vientiane, Laos. The table 4 below presented the summary in percentages of students in Laos and Sweden about frequently of internet usage:

<table>
<thead>
<tr>
<th>Survey for Frequently of internet usage</th>
<th>Survey in Vientiane (Laos)</th>
<th>Survey in Borås (Sweden)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>everyday</td>
<td>4 or 6 days a week</td>
</tr>
<tr>
<td>on mobile phone</td>
<td>65.06</td>
<td>19.28</td>
</tr>
<tr>
<td>own computers</td>
<td>32.53</td>
<td>30.12</td>
</tr>
<tr>
<td>at school</td>
<td>27.71</td>
<td>14.46</td>
</tr>
<tr>
<td>at internet cafe</td>
<td>1.20</td>
<td>3.61</td>
</tr>
<tr>
<td>at home</td>
<td>55.42</td>
<td>26.51</td>
</tr>
<tr>
<td>entertainment</td>
<td>44.58</td>
<td>22.89</td>
</tr>
<tr>
<td>communication</td>
<td>65.06</td>
<td>25.30</td>
</tr>
<tr>
<td>search engine</td>
<td>36.14</td>
<td>36.14</td>
</tr>
<tr>
<td>daily internet usage</td>
<td>66.27</td>
<td>24.10</td>
</tr>
</tbody>
</table>

Table 4: Percentages of students using internet frequently in Laos and Sweden
The above table 4 shows that students like using internet everyday, they like to access internet by their own computers and mobile phone at home more than at school and internet café. The communication websites (Skype, Email, Facebook, Messenger, and etc…) are very popular for them to communicate with each other (54 students=65.06% use everyday).

In the table 5 below presented the questionnaire answers of spending times on internet usages per day in Laos and Sweden that describe in detail below:

<table>
<thead>
<tr>
<th>Time spending on internet for a day</th>
<th>Vientiane, Laos</th>
<th>Developed country(Sweden)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below90m</td>
<td>90-180m</td>
</tr>
<tr>
<td>spend time for a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entertainment</td>
<td>29 61.70</td>
<td>18 38.30</td>
</tr>
<tr>
<td>Communication</td>
<td>13 27.66</td>
<td>32 68.09</td>
</tr>
<tr>
<td>Search engines</td>
<td>35 74.47</td>
<td>12 25.53</td>
</tr>
</tbody>
</table>

Table 5: Time spending on internet per day

The above table 5 shows that students in Borås, Sweden spent time on internet more than students in Vientiane, Laos. However student in Vientiane, Laos spent time on communication websites more than students in Borås, Sweden. The summary in percentages of spending times on internet usages of students in Laos and Sweden will be presented in figure 5 of bar chart below:

The bar chart of figure 5 shows the percentages of student spent time on the internet for a day that 70% spent time more than 3 hours, 29% spent time 90minutes to 3 hours, and only 1% spent time below 90 minutes. Students spent time for a day on entertainment websites that 43% spent time below 90 minutes, 45% spent times 90 minutes to 3 hours and only 12% spent times more than 3 hours. Students spent time for a day on communication websites that 19% spent time below 90 minutes, 60% spent time 90 minutes to 3 hours and 20% spent time more than 3 hours. Students spent time for a day on Search engine websites that 80% spent time below 90 minutes and 20% spent time 90 minutes to 3 hours, but no one spent time more that 3 hours.
In the following table 6 presented the questionnaire answers about students’ learning based on the internet using and their interaction in Vientiane, Laos and Borås, Sweden that described in detail below:

<table>
<thead>
<tr>
<th>Survey for learning and internet use</th>
<th>Vientiane, Laos</th>
<th>Borås, Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>miss classes in this semester</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>discussion with friends by face to face</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>discussion with friends by online</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>searching on internet</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>discussion with family members</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>reading from library/other sources</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>reading from internet</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>Learn something new</td>
<td>30</td>
<td>16</td>
</tr>
<tr>
<td>find information that they want to learn</td>
<td>20</td>
<td>22</td>
</tr>
</tbody>
</table>

Table 6: Learning and internet use in Laos and Sweden

The finding in table 6, students in Laos like to discuss with friends about learning by face to face more than online, but students in Sweden like to discuss with friends about learning by online more than face to face. The summary percentages of students in Laos and Sweden about their learning based on internet usages that presented in figure 6 of bar chart below:
The figure6 above shows that: students find information from internet that they want to learn, where 43% always, 49% usually and 7% rarely. There are 56% of students always, 36% usually, and 7% rarely learn something new from internet and 36% of students always, 33% usually, 28% rarely read from internet.

In the following table7 presented the questionnaire answers results in previous semesters of students in Vientiane, Laos and Borås, Sweden. There are 10 subject studies (VG=80-100, G=50-79, F=below50) in the secondary school in Laos but in Sweden, there are 17 subject studies (VG=80-100, G=60-79, F=below60). The survey finding describes in detail below:

<table>
<thead>
<tr>
<th>Study results of students</th>
<th>Vientiane, Laos</th>
<th>Borås, Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VG</td>
<td>G</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>No subject</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1 subject</td>
<td>2</td>
<td>4.26</td>
</tr>
<tr>
<td>2 subject</td>
<td>3</td>
<td>6.38</td>
</tr>
<tr>
<td>3 subject</td>
<td>10</td>
<td>21.3</td>
</tr>
<tr>
<td>4 subject</td>
<td>10</td>
<td>21.3</td>
</tr>
<tr>
<td>5 subject</td>
<td>4</td>
<td>8.51</td>
</tr>
<tr>
<td>More than 5 subjects</td>
<td>18</td>
<td>38.3</td>
</tr>
</tbody>
</table>

Table 7: Student study results in previous semester in Laos and Sweden

The above table7 shows that many students in Borås, Sweden did not get grade F in any subjects (91.7%), but in Vientiane, Laos there are 59.57% of students did not get grade F in any subjects. However, more students got VG in many subjects in their study. The summary in percentages of students’ result of their study in Vientiane, Laos and Borås, Sweden are presented in figure7 of bar chart below:
The results of students’ learning in previous semester from figure 7 above shows that: For the grade VG, 53% of students got over 5 subjects, 6% got 5 subjects, 17% got 4 subjects, 14% got 3 subjects, 7% got 2 subjects, and 2% got 1 subject. For grade G, 11% did not get G in any subjects, 12% got 1 subject, 11% got 2 subjects, 8% got 3 subjects, 14% got 4 subjects, 7% got 5 subjects, and 36% got more than 5 subjects. For the grade F, 73% of students did not get grade F in any subjects, 17% got 1 subject, 7% got 2 subjects, 1% got 3 subjects and 1% got 5 subjects.

4.5 Empirical research result

**Sub-question 1:** What are the relationships between internet usage and students’ learning?

According to the survey questionnaires with students of the secondary school in Vientiane (Laos) and Borås (Sweden), the results turn out that 69% of students have experiences of using the internet more than 2 years, 86% of students like using the internet more than 4 days a week, and 69% of students always and usually like reading on internet that more than reading from library and other sources. There are 78% of students always and usually search on the internet when they do not understand their assignment/homework that more than discuss with friends and family members. The most students did not answer “Never” on the questions of internet usages can help them to learn something new and find information that they want to learn. The students who have more experiences and spending more time on internet for study purpose, they achieve better grades. Thus, internet usages have the positive effect with students’ learning.

**Sub-question 2:** Can internet usage improve students’ learning?

According to the survey and sub-question 1, we found that only 10% of students do not use the internet every day/use internet less than 3 days per week. There are not any students think internet is the least useful for their learning, and 93% of students think that internet usually and always helps them to learn something new and finds information that they want to learn. The results of students’ learning in previous semester also shows that many students get the good grade where 53% of students got VG in over 5 subjects that more than G (no F). And 73% of students did not get grade F in any subjects, just only 27% got grade F in 1 to 5 subjects. From our survey findings we can see that students who got grade F as a person likes less using internet for his/her learning. Therefore, we argue that absolutely, internet usages can improve students’ learning.

**Sub-question 3:** What are the differences of internet usage for learning between developed and developing countries?

After examining with the survey by questionnaires in developing country (Laos), and developed country (Sweden), we found that the students in Vientiane (Laos) like using internet to search documents by search engine more than communication and watching video. On the other hand, students in Borås (Sweden) like using the internet to communicate with friends and have experiences of internet usages over 2 years that more than students in Vientiane (Laos) where just only 45% of them have experienced over 2 years. The students in Borås (Sweden) use internet over 3 days per week as 81% of them use every day, 90% of...
them never use at internet café and 86% of them use over 3 hours a day, that's more than student in Vientiane (Laos). The students in Vientiane (Laos) like discussion with friends by face to face about their learning more than by online that differences from the students in Borås (Sweden). However, the study results in previous semester of students in Boras (Sweden) as 92% of them did not get grade F in any subjects (17 subject studies), but 60% of student in Vientiane(Laos) did not get grade F in any subjects(10 subject studies). Therefore, we argue that the studying and the use of internet in a developed country (Sweden) are better than in developing country (Laos), as the model for developing countries. Thus, they should implement improvement information technology (IT) in the teaching and learning processes.

**Sub-question4:** What important design principles can be used to create a more efficient HCI for internet based learning?

The interaction between students and internet/computer usages are necessary to implement for improvement of learning. The results of the survey with students show that they like to access the internet on their mobile phone every day more than PCs or their own computers. As, 84% of students use internet by mobile phone and 90% of them like using communication website, in over 3 days a week. There are 78% of students usually and always search on the internet when they do not understand the assignment / homework, and they like reading from the internet more than reading from library and other sources. The use of internet is not only convenient for communication with friends but it also helps them to learn something new and get information that they want to learn as well. However, students like using communication and entertainment websites more than searching information and reading for study from the internet. Thus, in order to fulfill efficient HCI of student requirements that should be emphasis on: Interaction design with application improvement; Investigation of students’ learning from the internet; Update information and system that easy to learn and easy to use; Improvement of sharing information; and motivate them to increase learning based on internet usages.
5 ANALYSIS AND RESULT

5.1 Analysis methods

According to the purpose of this paper, it is necessary for analysis to get the result of the relationship between internet usage and students’ learning. Correlation analysis of pearson’s $r$ (Byman and Bell, 2011) is a method for examining relationship between interval/ratio variables. According to Byman and Bell (2011), pearson’s $r$ is a measure of the linear association between two quantitative variables to indicate the strength and the direction of the relation ($-1 \leq r \leq 1$). This means that the coefficient will almost certainly line between 0 and 1 (the stronger relationship if the coefficient is closer to 1, whereas the weaker the relationship if the coefficient is closer to 0), the coefficient will be positive or negative. This method will be conducted with the sub-question1 to transform the relationship and it also relates to sub-question2 as well. We also analyze the section of using internet and students’ learning with sub-question2 that compare with the theoretical finding. The analysis of sub-question3, we analyzed it and presented in the text which the differences locations of internet usage and learning. The analysis of user interface as students and internet usage will be conducted with sub-question4 that focuses on internet based learning.

Sub-question1: What are the relationships between internet usage and students’ learning?

Hypothesis1: Internet usage is a relationship with students’ learning.

In the section 3.9, the relationship between internet usage and student learning play a central role in re–structuring social interaction and knowledge construction. The use of internet can promote self-learning to offer a rich selection of learning experiences. The finding from empirical survey indicated that 78% of students always and usually search on internet when they do not understand the assignment/homework.

The previous research in section3.3, internet usage of students has positive effects on their attitude toward learning, and also Web-site browsing and Web-page making, had positive effects on self-efficacy. However the positive effects of internet use on students’ attitude toward learning are not strong relationships. From our empirical results, internet can help students' success in their learning because students got grade VG in many subjects of previous semester as a person who spent more time on the internet. The analysis conducted with the spending time on the internet per day and number of grade VG from students that described in the hypothesis testing bellow:

Hypothesis testing:

$H_0$: $r = 0$ (No relationship exists between the variables)

$H_A$: $r \neq 0$, $r < 0$, $r > 0$ (A relationship exists between the variables)

Concept: If value of significance level (from table correlation analysis) $> .05$ = Accept $H_0$

If value of significance level (from table correlation analysis) $< .05$ = Reject $H_0$ and accept $H_A$. 

[48]
We want to know the relationship between X (Time spending on internet) and Y (Number subjects of VG). If we start by constructing a scatter plot we obtain the following result:

![Scatter plot showing a positive correlation between spending time on internet and grade VG.](image)

**Figure 8: Students’ grade VG and minutes of spending on internet**

The figure 8 above shows that when variable of X(Time spending on internet) increase, the variable Y(Number of grade VG) increase also. This result means that higher spending time on the internet and higher numbers of grade VG. If we calculate the correlation coefficient between these variables by using statistical software SPSS we obtain the following result:

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Spending time per day</th>
<th>VG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time spending on internet and number of grade VG</td>
<td>Pearson Correlation</td>
<td>.861**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Spending time per day</td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.861**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).**

**Table 8: The correlation analysis of grade VG and minutes of spending on internet**

The size of the correlation coefficient indicates quite strong relationship between X(Time spending on internet) and Y(Number of grade VG). The significance level of the coefficient indicates that the variables move in the positive direction.

The result of correlation analysis presented that value of significance from table=.000 is lower than significance level .05, so rejected H₀ and accepted H₁. This means that internet usage has a positive relationship with students’ learning. There is clearly a positive relationship because the correlation coefficient \( r = +.861 \) means that internet usage is quite a strong positive
relationship with students’ learning. In section 3.6 stated that online enrollment reached 2.35 million during 2004, an 18.2% growth rate over 2003. Additionally, 64% of southern higher-education institutions identified online education as a critical long-term strategy. In section 3.7, IT in education is being used by learners in their attempts to solve the challenge of educational effectiveness. The use of information technology in education has a positive impact on students’ learning, which improves learning.

After analyzing theoretical and empirical result, we argue that internet use is a stronger relationship with students’ learning that higher of using the internet and higher grades of their study. We agree and accept hypothesis 1 as internet usage is a relationship with students’ learning.

Sub-question2: Can internet usage improve students’ learning?

Hypothesis2: Internet usage can improve students’ learning.

The previous research in section 3.3, internet is very useful for students’ learning that it had assisted them generally in their areas of specialization, and helped them in writing their technical reports, assignments, seminar papers, interaction with friends and relations. From our empirical findings, there are not any students think internet is the least useful for their learning.

In section 3.8, Learning through the internet offers an entirely new horizon with virtually unlimited boundary. The use of technologies enhances learning in the way of development as the view in attention that offers educational advantages independently of the individuals engaging with them for specific purposes. From our empirical findings, 93% of students think that the internet usually and always helps them to learn something new and finds information that they want to learn.

In section 3.9 states that internet based students had come active learners and more effective than classroom learning because online learning environments are learning network to help participants develop their competences by sharing information and collaborating with each other. It helps learners to build new associations, find new opportunities, and independence to learn at home. The internet has huge potential to improve study habits and schoolwork, as a virtual reference library to help them quickly locate information, communicate with friends, and satisfy curiosity.

Previous survey finding, about 61.5% of the students preferred reading books, journals, and newspapers from internet searching. The internet support learning environments, students could be participating and accessed conveniently in learning anytime and anywhere. From our empirical findings, 69% of students prefer reading from the internet. Therefore, the theoretical finding related to the empirical finding that the internet can improve students’ learning. Thus, we conclude that internet usages can improve students’ learning which 86.1% of confidences, to let them better studying when increase using the internet. So, we agree and accept hypothesis 2 as internet usage can improve students’ learning.
**Sub-question3:** What are the differences of internet usage for learning between developed and developing countries?

**Hypothesis3:** The using of internet and studying of students in developed country are higher than students in developing country.

In section 3.10 stated that e-learning brings a community of learners together and unrestricted by the time and place where students are able to discuss with other fellows. In section 3.11, all developed countries use new technologies to help in the education in learning development as e-technologies. Whereas most of the developing countries, the e-technologies have not permeated to a great extent in many higher learning institutions. In developing countries, one of the biggest limitations for implementing E-learning is technology and their infrastructure. In terms of infrastructure, most of the developing countries are shortage of electricity and poor condition of landline and broadband connection is the major problem for implementation of E-learning. Developed countries students think the internet is the most useful for learning so they use it every day that more than developing countries. After survey, we found that students in developed country are highly of using internet that more than developing country.

In section 3.10, developing countries are very low level of e-learning resources available for students like the traditional learning mode, and the student’s assimilation is limited. From our empirical results, 72% of students in developed country like discussion about assignments or homework with friends by online more than face to face, whereas 85% of students in developing country like discussion by face to face more than by online. However, students in developed and developing countries like the similar of using internet such as: do assignment/homework by searching on internet, reading from internet and other sources. They also think the internet can help them learn the new things and find information that they want to learn as well.

Our theoretical results and empirical findings indicated that studying and using internet of students in developed country are highly, thus we agree and accept hypothesis 3 as the using of internet and studying of students in developed country are higher than students in developing country.

**Sub-question4:** What important design principles can be used to create a more efficient HCI for internet based learning?

**Hypothesis4:** The interactive HCI for students’ learning.

Human computer interaction is an interaction between computer and people, which include human factors, usability, user interface and interface design of the system. And these factors integrate each other to make possible for the interaction of human with the computer. In section 3.12, HCI makes the relationship between people and computers base on system to interact with each other that concerned with internet-based learning. From our survey finding, students like using communication and entertainment websites more than searching information and reading from the internet. In section 3.12.1, for successful systems design, evaluation, technical dimensions of work and involves human acknowledgment need to understand how the system should perform according to student/user needs. We found that
students like to access the internet on their mobile phones every day that more than PCs about 32% (compare differences). It concerns with interaction design to base on application improvement. In section 3.12.4 stated that the user interface is the aggregate of means by users’ interaction with a particular machine, device, and a computer program. Human factors analysis required for the user-interface design as user interface needs to be designed that depends on information integration. In the section 3.13, communication is important for education to improve learning because the learning - teaching process cannot work without communication. There are 78% of students usually and always search on the internet when they do not understand the assignment / homework, and they like reading from the internet more than reading from library and other sources.

In the section 3.14, interaction design means that designing interactive products to support people in their everyday life and create their experiences. It focuses on constructing the ways of people interact with objects and systems. Interaction design develops interactive products to be easy, effective and enjoyable for users, which involves cognitive, social and emotional aspects, analyzing HCI, and proposed solutions are taken from various fields of computer science. These are concerned with the empirical finding that the interaction of students and computer/mobile is highly based on internet. Particularly, they are familiar of using on mobile phone because it is easy to learn and easy to use. In section 3.12.3 stated that usability is the result of relevance efficiency, attitude and learn ability as a key concept in HCI that concerned with making systems easy to learn and easy to use. It expresses the relationship between end users and computer applications as inherent in human computer interface. Usability is the compatibility of the system with the users’ cognitive characteristics of communication, understanding, memory and problem solving. Usability analysis helps researchers to understand better interface user behavior to be a better designed computer interface resulting in more efficient and less error-prone usability.

Therefore, the investigation of students’ learning from internet is essential implementing to identify the students’ requirement by updating information and system to be easy to learn and easy to use for them. In order to increase motivation of learning base on the internet, it is important for educational institutions to improve sharing information and the system to be useful for students because they like accessing on the internet. So, we agree and accept hypothesis 4 as the interactive HCI for students’ learning.

### 5.2 Result summary

**Sub-question 1:** What are the relationships between internet usage and students’ learning?

Internet usage is important and useful for students’ learning and promotes self-learning to offer a rich selection of learning experiences. There are 78% of students always and usually search on the internet when they do not understand the assignment/homework. The relationship between internet usage and students’ learning play a central role of their interaction that they prefer accessing on the internet for their learning. The internet can help students to success in their learning, so it is important and useful for students’ learning and promotes self-learning to offer a rich selection of learning experiences. IT in education is being used by learners in their attempts to solve the challenge of educational effectiveness.
The use of information technology and internet in education has a positive impact on students’ learning that higher of using the internet and higher grades of their study. Thus, internet usage is a stronger relationship with students’ learning and the level about 86.1% of confidence. We argue that internet usage is very important for students’ learning and it also helps them learn the new things and find information that they want to learn.

**Sub-question 2: Can internet usages improve students’ learning?**

The internet is very useful for students’ learning to be solving their exercises/homework by searching and communicating with each other as more than 60% of them prefer reading from the internet. It also helps them in writing their technical reports, assignments, seminar papers, interaction with friends and relations. The use of technologies enhances learning to offer educational advantages independently of the individuals engaging with them for specific purposes. The internet helps many students (more than 90%) to learn something new and finds information that they want to learn. It offers students to exchange their experiences and knowledge with each other to create and elaborate their competence profiles. Internet based students had come active learners and more effective than classroom learning because online learning environments are learning network to help participants develop their competencies. The students got many grade VGs as the ones are highly of using internet. Therefore, the internet usages can improve students’ competence, ability, skill and self-managed learning and increase learning by doing because it improves better their studying when increases using internet.

**Sub-question 3. What are the differences of internet usage for learning between developed and developing countries?**

Developed countries are higher by using e-technologies in the education for learning improvement that push students have more experiences of using the internet than students in developing countries. This may the reason for students’ study in developed countries is better than students in developing country as well. In developing countries, technology and their infrastructure are one of the biggest limitations for implementing E-learning, and they are lacking of using e-technologies in many higher learning institutions. In terms of infrastructure, most of the developing countries are shortage of electricity and poor condition of landline and broadband connection is the major problem for implementation of E-learning. Thus, students in developing countries are lack of using internet and for that reason they like discussing face to face more than students in developed countries. However, both students in developed and developing countries prefer by using the internet for their learning because it is useful for their learning and they also believe that the internet can help improving their learning.

**Sub-question 4: What important design principles can be used to create a more efficient HCI for internet based learning?**

The interaction between students and computer/mobile phone is increasing every day as internet based learning. The finding indicates the students prefer reading from the internet more than reading from library and other sources. HCI makes the relationship between people and computer systems that concerned with internet-based learning to let students of using
communication and entertainment websites. Human factors analysis required for the user-interface design and user interface designed that depends on information integration. In order to understand user needs, it is necessary for the successful systems design, evaluation, technical dimensions of work and human involves acknowledgment. Interaction design makes students to access internet on mobile phones every day more than PCs because it is convenient, available to them anytime, anywhere and also easy to learn and easy to use. Interaction design develops interactive products to be easy, effective and enjoyable for users, which involves cognitive, social and emotional aspects, analyzing HCI, and proposed solutions are taken from various fields of computer science. Thus, the improvement of sharing information and system is essential implementing in education institutions as internet base-learning, because students like communicating with each other by online and searching on the internet for their learning. Increasing and updating information system can be easy to learn and easy to use based on students’ requirement, so that they can use the internet frequently.
6 DISCUSSION

6.1 Conclusions

The use of information communication and technology (ICT) is essential for new social life for students to improve idea, ability, skill, and experiences in the field of internet for learning, information science and informatics. The internet helps students to practice their knowledge of learning efficiently. Developed countries are highly of using technology and information system as internet that emphasis in the educational institutions to be stronger in teaching and learning. Students in developed countries are familiar with using the internet that can improve their study. Whereas, students in developing countries are poor interaction with information communication and technology (ICT) to let them weak of learning by using internet. Developing countries are poor bandwidth broadband system and bad conditions of landline for internet access to interact with each others. Internet usage increases communication and interaction to improve students’ learning activities easily and efficiently. However, students in developed and developing countries believe that the internet is useful for their learning to let them increase more attention by using it anyway.

Internet usage helps students in developed and developing countries for searching huge of information in a more efficient to enhance and update their learning skills. The internet can improve students’ learning on their competencies, skills & abilities and self-managed learning, because it lets them have opportunities to interact with each other easily, effectively and efficiently. Internet based learning offers students to exchange their experiences and knowledge with each other, work collaboratively on projects, set up working groups, communities, discussions, conferences, find learning resources, create and elaborate their competence profiles, assess themselves and others etc...

We also found that the internet helps students’ learning in developed and developing countries such as: they prefer to search on internet to solve their assignments. And it helps students to communicate with each other by an online network, to discuss and share idea easily. The students always and usually find information that they want, and also learn something new from internet. We examined in students who have experience of using internet in both developed and developing countries, the result indicated that the students got many grade VGs as the ones are highly of using internet.

Nowadays, mobile phones are very popular for students’ interaction in developed and developing countries as internet-based learning because it is easy, convenient and available for them anytime and anywhere. In our research found that internet usage is essential for students’ learning of their everyday life. It can improve their experiences, skills, competences, communications to be easy and playfulness of their interaction. Thus, developed and developing countries are highly to emphasis on the use of information technology in education because it has a positive impact on students’ learning. The internet improves learning and teaching to increases students’ satisfaction and performance expectancy. Students in developed and developing countries who are highly of using internet as the ones are better learning. Therefore, we argue that internet usage is very important for students in
both developed and developing countries because the internet improves their competences, ideas, abilities, perceptions and communications for enhancing their learning to be better and stronger.

6.2 Implications for Informatics

The relationship between internet usage and students’ learning can be regarded in the era of informatics. The increasing of new technology impacts to institution education nowadays. The investigation in the relationship between internet use and students’ learning is essential for institution education to improve sharing information system and e-learning. The result turns out that internet use is a stronger relationship with students’ learning as it can improve their learning. This means higher of using the internet to improve students’ learning. Students interact with new information technology as internet based learning to be new upcoming trends in the field of informatics.

Our study about internet usage for learning improvement and e-learning systems are very close to each other. According to Friesen (2009), e-learning brings a community of learners together and unrestricted by the time and place where students are able to discuss with other fellows and teachers via online and gather different types of knowledge from the different discussion forum. Our study results are very important to adopt e-learning system for enhancement of upper secondary school students’ learning effectively and efficiently in developed and developing countries. The results help to understand the use of internet that is important for students’ learning and its integration with e-learning field as in developed country is stronger of using e-learning and the students are also better in learning.

Human Computer Interaction (HCI) concerns with interaction design principle as usability and interface design, which improve information system for students’ learning base on internet usage, and sharing information. The improvement of sharing information system is essential implementing for education institutions as internet base-learning, because students like communicating with each other by online and searching information on the internet for their learning. The interaction of students’ learning with online system base on interaction design to design and improve sharing information system that's easy to learn and easy to use for students. It also helps to improve e-learning system to be better that integrates with the field of informatics as well.

The important implications for era of information technology based on internet usage that is successful in developed country. It is the model for developing country should be focused on internet-based learning, e-learning, improve motivation of using internet and IT infrastructures for analyzing and designing the information system. The use of modern information technology practices improving their knowledge and competence to be resolve the problem facing and automatically increase implication of informatics.
6.3 Method evaluation

In this research conducted with the theoretical and empirical study about internet usage for improvement of learning in the field of informatics. Theoretical study is very important to understand information technology for students’ learning that concerns with HCI and interaction design. The library database of University of Borås is comfortable to help us in finding some books, journal articles, and other papers that related of our purpose as research questions. The theoretical study is quite difficult for finding the specific areas to relate to research questions, because different authors are different concepts. The combination to relevant with research question is very difficult in implementation. Sometime, it has also been difficult to combine from different subject areas together as the problem that it overlaps with each other.

Our empirical study is limited with case study as just students in upper secondary school (15-18 years old) that is quite narrow area, and it is not cover students who over 18 years old. We spent more time with structure questionnaires for survey to form it into numerical because we conducted with quantitative research. However, the theoretical study solved our problem successful with generating structure form base on purpose for data collection in the empirical study. The application of SPSS and Microsoft Excel are useful for collecting data and transform into analysis to get the result of numerical statistics. It was complicated for analysis to combine theoretical result and empirical result because theoretical data are textual data but empirical data are numerical data. Thus, our analysis is implemented by summary of description data to get good result for answering research questions.

6.4 Result evaluation

After analyzing from theoretical and empirical results, we use four categories such as: reliability, measurement validity, internal validity and external validity methods to evaluate the results in quantitative research.

Result of reliability has been created trustworthiness and consistency of the research such as theoretical study with several articles, books and reports in the same area. Unfortunately, there were not many scientific articles related to the relationship of internet usage and learning. However, our attention perceived the main source of information from reliable scientific articles, books relevant with internet usage for learning. Authors had the same arguments that internet usage is positive for learning. In the survey, many students were similar with collecting data from questionnaires. The results of empirical were presented by statistical numerical as the credible and reliable results. Correlation and coefficient result is more credible and reliability of this research.

Measurement validity is also often referred to as construct validity that related reliability. The results of theoretical are from scientific articles, books as internet usage has positive relationship with learning that concern with our empirical study. Finding from statistical analysis with students’ study result and their spending time on internet turned out that the relationship is a stronger relationship. Thus, we have argument that internet is stronger relationship with students’ learning for the group of young people.
Internal validity relates mainly to the issue of causality, to be a reasonable of measurement in quantitative research. Theoretical and empirical findings are very important for the research purpose. This research can be solved all research questions, but sometime is overlap each other because sub-question1&2 are similar. The finding from theoretical is based on scientific research articles to verify and combine into new areas. Students’ answering questionnaires are based on their real life facing in the current situations. The result from the different locations is more evidence to be internal validity.

The key opinion of the external validity method is the process of generalization, whether the results can be extended from a small sample group to the whole population to predict about them. In our research, the theoretical study indicated that the relationships between internet usage and learning improvement on the basis of real world problem in education institutions. Our empirical study on the basis of theoretical results to getting students' opinion, which have experiences in internet based learning and existed problem in developing country about internet usage for learning improvement. The result from previous research is not clear of the relationships between internet usage and learning, because there were not specific result in this area. However, our empirical results are specific in a group of young students 15-18 years old. After analyzing, we generalized result summary of our research and our result validation aligned with the external validation method.

6.5 Possibilities to generalize

In our research theoretical results are verified by empirical results and then both results are verified according to the analysis criteria. We have collected our relevant literature and paper which published in the different journals, books, international publications from database in university of Borås, and other sources from the internet. These relate to internet usage for improvement of learning as the theoretical results. We have used the standard theories in our research with proper referencing. We have conducted a survey through questionnaires for collecting our empirical data. In order to be comfortable of this research, our sample is limitation as in Sweden and Laos that selected students who are the representatives of the locations by non probability sampling. We used a survey with students (15-18 years old) who have experiences of using internet from the different locations to ensure the scientific research results. However, we have received the 83 students’ respond answers from developing country (Laos) and developed country (Sweden). The students answered the questionnaires by choosing the number easily that a regard to their background (learning and frequently of using the internet). After collecting the empirical data, we had analyzed our empirical finding by using statistics software SPSS and Microsoft Excel to transform the data into numerical for the validation of our research findings. Finally, our research will present accurate results to target groups with a clear understanding, which generalized our research. Though it is one of the limitations of our thesis that are sample size is not big enough to generalize the conclusions, but we got desirable results from our survey to draw conclusion in our study.
6.6 Ideas for continued research

Our research investigated, identified and analyzed of students’ learning for internet usage in one developed country and one developing country. Internet for learning is a wide area of information technology and increasing day by day that following with the problem. Thus, the investigation is necessary to be continued in this specific area with more evidences and validation. This study also can be expanded in this relevant area. We examined in the positive effects of internet usage for students’ learning by sampling with the representative of students in different locations. We had sampling with 83 students in class year 9 of secondary school (15-18 years old). Therefore, in the future research is also possible to be specific research in the case study or experiment with the students. The future research can also conduct with any group of students in any education institutions such as children, youths, teenagers, adults and over. In order to be more evidences the negative effects of internet usage also needs to investigate in the comparison with positive effects for the future research. This research may useful for education institutions in design principles of HCI in internet based learning to emphasize improving, updating and sharing information system to be easy to use and easy to learn for students. Our research also may useful for designing interactive HCI for internet base learning.
References


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Appendix: Questionnaires for empirical survey.

Your answers and comments will help us to complete with our final Master thesis at University of Borås. We are therefore very keen that you try to describe your view of the following topic with 32 questions. We are very grateful to you for answers these questions.

Questions for survey (Please answer the questions by symbol ✓)

1. Are you male or female?
   Male (1), Female (2)

2. How old are you? ______ years

3. Which of the following best describes your main reason for using internet? (please tick one only)
   - Watching movies, songs, news, and etc… ___ 1
   - Communicate with friends (email or chatting) ___ 2
   - Searching documents and download data ___ 3
   - Other (please specify) _____________________________ 4

4. Do you have mobile phone?
   Yes (1), No (2)

5. Do you have your own computer?
   Yes (1), No (2)

6. How often do you use internet on your mobile phone?
   Every day (1), 4-6days a week (2),
   2-3days a week (3), Once a week (4), 2-3times a month (5),
   Once a month/less than once a month (6), Never (7)

7. How often do you use internet on your own computers?
   Every day (1), 4-6days a week (2),
   2-3days a week (3), Once a week (4), 2-3times a month (5),
   Once a month/less than once a month (6), Never (7)

8. How often do you use internet at school?
   Every day (1), 4-6days a week (2),
   2-3days a week (3), Once a week (4), 2-3times a month (5),
   Once a month/less than once a month (6), Never (7)

9. How often do you use internet at internet cafe?
   Every day (1), 4-6days a week (2),
   2-3days a week (3), Once a week (4), 2-3times a month (5),
   Once a month/less than once a month (6), Never (7)

10. How often do you use internet at home?
    Every day (1), 4-6days a week (2),
    2-3days a week (3), Once a week (4), 2-3times a month (5),
    Once a month/less than once a month (6), Never (7)

11. How often do you use the entertainment websites (Youtube, TV, music, video movies, and etc…)
    Every day (1), 4-6days a week (2),
12. How often do you use the communication websites (Skype, Email, Facebook, Messenger and etc…)
   Every day___(1), 4-6days a week___(2), 2-3days a week___(3), Once a week___(4), 2-3times a month___(5),
   Once a month/less than once a month___(6), Never___(7)
13. How often do you use search engine websites (Google, MSN, Yahoo, Magazines, and etc…)
   Every day___(1), 4-6days a week___(2), 2-3days a week___(3), Once a week___(4), 2-3times a month___(5),
   Once a month/less than once a month___(6), Never___(7)
14. How frequently do you use internet? (Please tick)
   Every day___(1), 4-6days a week___(2), 2-3days a week___(3), Once a week___(4), 2-3times a month___(5),
   Once a month/less than once a month___(6), Never___(7)
15. How long have you been experienced on internet use?
   Less than 3 months_____ 1
   3 to 6 months _____ 2
   6 to 12 months _____ 3
   1 to 2 years _____ 4
   2 to 3 years _____ 5
   More than 3 years _____ 6
16. How long do you spend on internet for a day?
   __________ minutes
17. During your access of internet, how many minutes do you usually spend on entertainment
   websites (Youtube, TV, music, video movies, and etc…) for a day?
   __________ minutes
18. During your access of internet, how many minutes do you usually spend on
   communication websites (Skype, Email, Facebook, Messenger and etc…) for a day?
   __________ minutes
19. During your access of internet, how many minutes do you usually spend on search
   engines websites (Google, MSN, Yahoo, Magazines, and etc…) for a day?
   __________ minutes
20. When using the internet, you think, is the internet useful for your learning?
   The least useful____(1), Less useful____(2), Useful____(3),
   More useful____(4), The most useful____(5)
21. How often do you miss classes in this semester?
   Always ____ (1), Usually____(2), Rarely____(3), Never____(4)
22. When you stuck with assignments after class, how often do you solve this problem of
   discussing with friend by face to face?
   Always ____ (1), Usually____(2), Rarely____(3), Never____(4)
23. When you stuck with assignments after class, how often do you solve this problem of
   discussing with friends by online)?
Always ___(1), Usually___(2),            Rarely___(3),            Never___(4)
24. When you stuck with assignments after class, how often do you solve this problem of searching on internet)?
   Always ___(1), Usually___(2),            Rarely___(3),            Never___(4)
25. When you stuck with assignments after class, how often do you solve this problem of discussing with family members (Parents, brothers/sisters)?
   Always ___(1), Usually___(2),            Rarely___(3),            Never___(4)
26. How often do you like reading books, magazine, etc... from library and other sources?
   Always ___(1), Usually___(2),            Rarely___(3),            Never___(4)
27. How often do you like reading books, magazine, etc... from internet searching?
   Always ___(1), Usually___(2),            Rarely___(3),            Never___(4)
28. When using the internet to search for information, how often do you learn something new?
   Always ___(1), Usually___(2),            Rarely___(3),            Never___(4)
29. How often do you find information that you want to learn from internet searching?
   Always ___(1), Usually___(2),            Rarely___(3),            Never___(4)
30. In previous semester, how many subjects have you got VG ?
    _____subject(s), (if no, write “0”)
31. In previous semester, how many subjects have you got G?
    _____subject(s), (if no, write “0”)
32. In previous semester, how many subjects have you got F?
    _____subject(s), (if no, write “0”)

Thank you for your attention!!!
University of Borås is a modern university in the city center. We give courses in business administration and informatics, library and information science, fashion and textiles, behavioral sciences and teacher education, engineering and health sciences.

In the School of Business and Informatics (IDA), we have focused on the students' future needs. Therefore we have created programs in which employability is a key word. Subject integration and contextualization are other important concepts. The department has a closeness, both between students and teachers as well as between industry and education.

Our courses in business administration give students the opportunity to learn more about different businesses and governments and how governance and organization of these activities take place. They may also learn about society development and organizations' adaptation to the outside world. They have the opportunity to improve their ability to analyze, develop and control activities, whether they want to engage in auditing, management or marketing.

Among our IT courses, there's always something for those who want to design the future of IT-based communications, analyze the needs and demands on organizations' information to design their content structures, integrating IT and business development, developing their ability to analyze and design business processes or focus on programming and development of good use of IT in enterprises and organizations.

The research in the school is well recognized and oriented towards professionalism as well as design and development. The overall research profile is Business-IT-Services which combine knowledge and skills in informatics as well as in business administration. The research is profession-oriented, which is reflected in the research, in many cases conducted on action research-based grounds, with businesses and government organizations at local, national and international arenas. The research design and professional orientation is manifested also in InnovationLab, which is the department's and university's unit for research-supporting system development.