

## **Role of Information Technology on Learning System in Higher Education**

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### **Abstract**

Development of Information Technology has been very extensive and unstoppable, pervading aspects of national life. Inevitably, we are expected to handle information technology. In the world of Information Technology, education has always been holding important role within education reform. Eversince the increasing role of information technology in education, information system of learning in Higher Education has changed rapidly. The implementation of of technology in the education system in universities is expected to shift the nature of an introvert/closed education into an extrovet/open and more proactive education. Learning process empowerment will allow a more creative, innovative and competitive education.

**Keywords:** Information Technology, Learning System, University.

### **Introduction**

Rapid development of science and technology is reflected on all areas of everyday life. Advances in information technology bring order to life worldwide. Everyone can access information in order to find out what is currently happening in other countries. The era of globalization is no longer unstoppable, requiring us to participate and compete in a variety of fields.

Information Technology within in all aspects of life has also pervading the education world. Technology can now be used as tools to support efficiency and effectiveness of the teaching and learning process at the university on this era of globalization. Yet many universities has not utilize Information Technology to support their teaching and learning process eventhough it is inevitable to resist Information Technology on this era of 21st century. This paper is written for universities to understand the importance and benefit of Information Technology in Higher Education Learning System. Few questions arise: 1) what are the role of Information Technology in supporting Learning Systems in Higher Education?; 2) what are the challenges and obstacles that may arise to implement Information Technology in Higher Education? and; 3) How Information Technology in Higher Education should be implemented? These descriptions below are presented to answer the three questions above: Characteristics of Higher Education; Application of Information Technology; Implementing Opportunities of Information Technology, and; Challenges in implementation of Information Technology in Higher Education. As summary, conclusions and suggestions will conclude this paper.

### **Characteristics And Higher Education Learning System**

#### **Definition, Function, Objectives and Characteristics of Higher Education and Learning System of Higher Education**

#### **Understanding Higher Education**

Higher Education, by definition, according to Law no. 20 of 2003, article 19, paragraph 1: "A college education is education after secondary education, including diplomas, bachelor, master, specialist, and doctoral degrees held by the college".

In addition college is also defined as educational institution at any higher level than secondary education on the education track. Universities are educational institution consisting of a number of faculties providing academic and/or professional education in a particular discipline (H. Basir Barthos, 1992:25).

## Higher Education Function

According to R. Cony Semiawan (1998:12), general obligation of higher education institution has expanded due to a new paradigm of accountability, quality of education, autonomy and self-evaluation of higher education that is required by a future demand of excellence actualization of optimal human capabilities—in reference to hidden excellence in personhood such optimization is still "hidden". The principles refer above were confronted by variety of crucial issues in development strategy. New civilization of the 21st century has given hope to new college that is able to produce competent graduates in order to survive and grow into optimal excellence actualization. Nevertheless strategy to achieve such goal is determined by the vision and policy of decision makers during the process of development of higher education in the said college, under the responsibility of university leaders.

Specifically, the task of the college can be seen in the Government Law no. 30/1990 regarding Higher Education. In the general provision, Article 1, paragraph 2: "College is an educational unit which organizes higher education".

Moreover, in the preamble of the Minister of National Education Decree number 603/O/2001 university should perform "an active role in improvement and development of quality of life and culture, development of science, and development of international understanding and cooperation to achieve world peace and sustainable welfare of mankind." Further explanation specified that in addition of the given task of organizing higher education, college is also responsible for development and improvement of human resources, development of international cooperation, world peace and the welfare of mankind.

## Functions of Higher Education

Conny R. Semiawan (1998:33), among others, also states that higher education is required to prepare students to possess compassion and hold values and norms in order to embody the totality of humanity within independent nation and to live in accordance with the state order.

### The purpose of higher education are:

1. to provide students with knowledge in order to become members of community with academic and professional ability to implement, develop and create science, technology and art.
2. to develop and implement science, technology and arts as well as to optimize their implementation to empower and enrich national culture (Act 2 of 1989, Article 16, Paragraph (1), PP 30 of 1990, Article 2, Paragraph (1) ).

## Characteristics of Higher Education

Lovelock (1983) identifies five characteristics of educational institution:

1. The nature of the service act. Services provided by educational institutions embody a more intangible—people-based—system instead of physical based equipment. Service process also involves intangible actions.
2. The relationship with the customer. Educational services involving consumer relationship lasts longer while it is formal and carried out continuously.
3. The level of customization and judgement in service delivery. With more customized services offered, consumers will have high level of expectations for service quality, especially in relation to quality of the teaching staff. The more variety of services offered, the higher the possibility of declining quality.
4. The nature of demand relative to supply. Within world of education, demand is associated with the narrow demand. Thus the requests will be difficult to manage since they are related to limitations of faculty and courses offered.
5. The method of service delivery. In education services, educational institutions usually require customers to come by the campus. Development of technology will allow distance learning.

## Learning Systems in Higher Education

In relation to Learning Systems in Higher Education consists of: 1) assumption that learning is to be hidden; 2) teacher-centered learning; 3) learning to 'memorize' concept, and; 4) classic learning individual.

## Paradigm of Application of Information Technology

With globalization of Internet Information Technology closes the distance and almost dismisses all boundaries. Information Technology then also provides advantages toward everyday life, including education; a new paradigm in field of learning, known as the 'distributed of knowledge' in lieu of 'transfer of knowledge', is turning the learning paradigm into learning process paradigm.

We are used to receive knowledge through learning from teachers and lecturers, yet now now we obtain knowledge by Information Technology. Function of teachers and lecturers is no longer the central source of learning. Educational institution once was the site of transformation of knowledge with its participant as education subject. Nowadays, students are considered as the process of learning subject, and obtainment of knowledge is no longer passed down but through distribution and sharing.

Optimizing Learning Process of Learning Process and Information Technology learning resources is two-sides of the same coin. It is impossible to mention one without the other. Source of learning is an instructional system components involved in the learning process called the dynamic element of learning. It is dynamic because any changes that occur in one of would result in a change in the whole learning activities. When changes occur, they will adapt mutually to each other.

Following is details of 10 (ten) roles that can be played by Information Technology: transactional, geographical, automatic, analytical, informational, sequential, knowledge management, tracking, and disintermediation. All of these roles can be contextualized with the requirement Higher Education institution. In other languages, Al-Mashari and Zairi (2000) states that benefits of IT is the ability to enable the use of IT within an organization involving 1) strategy execution; 2) technology transformation; 3) competitive potential, and; 4) service level. The first and the second perspectives assume business strategy as driving factors, while third and fourth perspectives assume Informational Technology strategy as driving forces. These perspectives are derived from assumption of different relationship between business strategy (business scope, distinctive competencies, business governance), organizational infrastructure (administrative structure, processes, skills), IT strategy (technology scope, systemic competencies, IT governance), and IT infrastructure (ie architecture, processes, skills).

## Opportunities In The Use Of Information Technology In Learning Process System In Higher Education

Information Technology in Higher Education can be tangible in many forms. Determining the purpose of utilization of information technology is the first important aspect. Alavi and Gallupe (2003) find the 9 (nine) technology utilization objectives, namely: 1) improving competitive positioning; 2) improving brand image; 3) improving quality of learning and teaching; 4) increasing student satisfaction; 5) increasing revenues; 6) expanding student base; 7) improving quality of care; 8) reducing operating costs; and 9) developing new products and services.

Campus-Wide Information System (CWIS), Internet, and multimedia are basics of Information Technology utilization at University. By using Information Technology, information regarding the university and its activities can be accessed by internal and external users, consisting news about the development of the campus, teaching and learning activities—that can be collected through application of learning management systems, inventory universities, research activities, and alumni data. The benefits of using CWIS is 1) to provide necessary support prior to term of enrollment of students re teaching and learning process. The system include lecture notes and assignments as well as providing easy contact between faculty and students, graduate students (18 Wahid - *Opportunities and Challenges Use of Information Technology in Higher Education research*); 2) to facilitate

coordination and manage universities (Kock and Corner, 1997; Semiawan and Middleton, 1999); 3) to change management structure (McClintok, 1998); 4) to form organizational hierarchy consisting of relatively flat, more flexible, highly educated, possessing a high sense of responsibility and able to work well in teams staffs. (Cairncross, 2001); 5) to sustain quick strategic decision making with availability of all the supporting data; 6) to reduce 90% of administrative employees (Gates, 1999) since employees' function as mediators are replaced by Information Technology.

The development of Internet technology has enabled a conversion from former CWIS based local network into a newer web-based one. CWIS is a web-based user providing easy access for a wider range of use overcoming boundaries of space and time. Development of mobile telecommunication technology of SMS (Short Message Service) and WAP (Wireless Application Protocol) has further added applicable user interface. Information and services provided universities then are made ubiquitous with implementation quality to support distance learning. With the help of Information Technology, mode of interaction can be done in synchronously and asynchronously. Facilitating inter-agency relationships are also different, both inside and outside of the university environment or even with overseas institutions (Applebee, Clayton, Paoe, and Bruce, 2000). Multimedia have also helped creating a fun learning environment (Butler, 2000; Edling, 2000; Peled, 2000) and makes learning process more attractive.

Optimizing role of Information Technology in Higher Education Learning System requires Information Technology literacy within the academic community. Universities should develop programs to improve Information Technology literacy to improve the end-user capability. It is one of the important requirements to optimize the role of Information Technology and to improve the performance of Learning Systems in Higher Education.

### **Challenges and Obstacles For it Implementation**

The challenges and barriers of adoption of Information Technology in Higher Education are: 1) fund. Implementation of Information Technology requires a very large investment.

University leaders, in this context, should be aware that the implementation of Information Technology does not focus only on efficiency and effectivity of strategic role but also on winning the competition. (Hartono, 2006). Full support from top management is necessary, both in the provision of funds and in leadership. Yet funding commitment must be well controlled; 2) lack of commitment and support from top management would be an obstacle in implementing Information Technology in Higher Education; 3) concerns over changes. Therefore 4) involvement of all stakeholders is another set of challenges that must be taken into account (Bashein et al., 1994). Change could not be done without commitment of all parties involved. The deciding factor in this case, in addition to rewarding good system, is good leadership. Other important part is good communication with all the parties. The involvement of all parties should occur not only during early stages of implementation but also until the implementation of information technology working properly. During this process, cultural adjustment will also be necessary to support the change of manual into digital culture. Information technology will be taken an important role and optimal with involvement of all parties and cultural adjustment.

### **Conclusion**

Role of Information Technology will provide support toward Systems Learning in Higher Education. Four important aspects needs to be kept in mind in order to realize such role of Information Technology: Fund, Top management's commitment, Concern of change, and Involvement of all parties, as well as cultural adjustment. Implementing Information Technology in Learning Systems in Higher Education then could be followed by corrective measures, adjusting quality of people, processes, and organizations.

## Advice

Implementation Information Technology in Higher Education Learning System requires a clear and strictly controlled operating plan. In order to keep the transformation smooth and optimal and to implement Information Technology within academic community, Information Technology needs supervision. Do not be afraid to involve Information Technology in Learning Systems in Higher Education. Because Information Technology has been a requirement in today's era of globalization and Information Technology will improve the quality of Higher Education.

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