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The General Components of e-Learning Framework for Higher Institution: A Systematic Literature Review

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Abstract— The Information and Communication Technology (ICT) already changed how teaching and learning process can be done in higher institution. Nowadays, learning process is not only be held in classroom but with E-Learning method, the process can be boundless. Moreover the existence of social media as a trend setter is becoming a new communication channel in higher institution to support the successful of learning process. This fact makes the transition from e-learning to social learning concept. Nevertheless, there is another important factor as motivation for students to display their own creations in learning process. Based on this phenomenon, this research conduct to explore what a significant components to build social learning framework that can enhance lifelong learning experience. This research using a systematic literature review approach to paper published in 2000-2015. The result shows that the most component for e-learning, which suitable for the successful design of social learning framework.

Index Terms— e-learning; Social media; Social learning; Component; Higher institutions.

I. INTRODUCTION

The internet has profoundly changed many aspects of day to day. Currently we use the web almost for every activity in daily life, such as find information, transaction (buying and selling product), play game, watch television, book ticket, seek mates, search for entertainment, learning, etc. This fact make internet be an important thing in people life, even people doing browsing or online seeking the anonymity still protected, they now more often use the internet platform to socialize with people they do know intensively [1].

The changing nature of communication will directly impact how human to interact with other. Social Media has successfully attracted many users to change their communication channel. The phenomenon of social media also occurred in higher institution [2]. For higher institution, it enabled students and instructors to communicate with each other, peers students or instructors, subject matter experts, and other party that are not available before [3]. The usage of social media to support higher institution activities can vary from marketing, communication, information, feedback, complain, announcement, sharing, task assignment and

examination. Since the existence of social media, there is a need to emerged e-learning process model.

The concept of e-learning has emerged for over last decades [4], it has transformed from sole text to using multimedia form and interactive tools, which made it more effective and efficient. This has made the education change from the educator centered era to be more learners centered. In learner centered environment the student is in the center of the learning process and all the resources available to support the students. In today world, a lot of resources (e.g. internet, blog, wikis, forum, e4) students regularly find resources other than class materials support.

The context of e-Learning in higher institution changes a paradigm for modern teaching and learning process. E-Learning is education delivery process of learning and training program using electronic platform [5]. The higher institution run the e-learning concept due to space limitation be it in term of locating the student in the classrooms [6], so it can enable access to a huge of information sources and expertise to develop global relationship and increased understanding to support the establishment of knowledge through interdisciplinary e-learning experience. In order to collaborate between social media and e-learning system, several conceptual models have been developed. Therefore, this research tries to define “what a general components of electronic learning to build social learning model?”. The concept of social learning is people have the opportunity to use information from their social network.

II. METHODOLOGY

This research conducted a thorough study literature review on the research about e-learning framework. This process is classified into several parts, which are: determining research sources, defining the pattern of keyword for searching process, initiating inclusion and exclusion criteria, extracting data, and analyzing the finding to answer research question.

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A. Search Process

The first process is defining the source of literature to find a suitable article/journal. The selected sources for systematic literature review are as follow:

- 5 CM Digital Library (dl.acm.org)
- IEEEExplore Digital Library (http://ieeexplore.ieee.org)
- Science Direct (www.sciencedirect.com)
- Palgrave Macmillan (www.palgrave-journals.com)
- Wiley Online Library (onlinelibrary.wiley.com)
- Emerald Insight (www.emeraldinsight.com)
- Springer Link (link.springer.com)
- Proquest (http://www.proquest.com/)
- Taylor Francis (http://taylorandfrancisgroup.com/journals/)
- Science and Engineering Research Society (http://www.sersc.org/)
- Citeseerx (http://citeseerx.ist.psu.edu/index)

According to Ozuorun and Tabak (2012), hierarchy ways of learning divided into figure 1. In this study, we focus on distance learning, so the pattern of keyword searching combined with some of terminology for distance learning and the heritage [7].

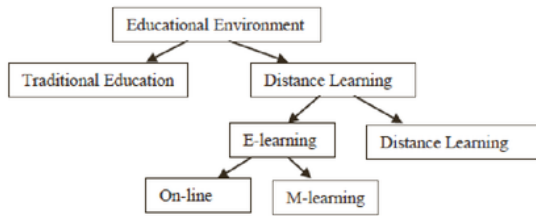


Figure 1: Ways of Learning [7]

1

The pattern of keyword that is applied to find the research paper which related to answer the research question is formed using Boolean operator to filter the data, so we can define the priority to search the data based on the symbols which are used. The symbols and Boolean operators that we used in this paper, such as OR, AND. The combinations of the keywords are as follows:

- (e-learning OR (elearning) OR (electronic AND learning) OR (social AND learning)) AND (component OR Attribute) (framework OR model) AND ((higher AND education) OR (higher AND institution))
- ((distance AND learning) OR (distance AND education)) AND (framework OR model) AND (component OR Attribute) AND ((higher AND education) OR (higher AND institution))
- ((mobile AND learning) OR (m-learning)) AND (framework OR model) AND (component OR Attribute) AND ((higher AND education) OR (higher AND institution))
- (online AND learning) AND (framework OR model) AND (component OR Attribute) AND ((higher AND education) OR (higher AND institution))
- (m-learning OR (mlearning) OR (mobile AND learning) OR (social AND learning)) AND (component

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OR Attribute) (framework OR model) AND ((higher AND education) OR (higher AND institution))

The inclusion criteria of searching mechanism consist of three processes of filter. The first is “Studies Found” process. All of the papers we found from source publication related to the specified keyword will keep as Studies Found. After that, the next step we filtering the paper according to the title and abstract. If the title and abstract complimentary and match to define the research question, then this paper will keep as “Candidate Studies”. Then the last part to filter these papers is all of the candidate papers will be read thoroughly to answer the research question. If the papers are appropriate to answer the research question, those papers will be defined as “Selected Studies”.

Meanwhile to clarify the validity of literature, the exclusion criteria of searching is defined into some procedure, which are:

- 5 The paper on the basis of their publication date before 2000
- Structure of the paper complete, which means all identity (journal inference, identity of author, etc) is mentioned in the paper.
- Duplicate paper of the same study is excluded in SLR

B. Data Extractions

The study literature was examined 202 papers from all resource and criteria. From 202 examined papers, there are 71 papers which being to be candidate studies based on related title and abstract to the research question. After studied further, there are only 37 papers which can be used in this research.

Table 1
Data Extraction in Inclusion Criteria

Source	Found	Candidate	Selected
ScienceDirect	109	40	17
Taylor & Francis	12	4	2
ResearchGate	9	4	1
Sage	6	3	0
Google Scholar	1	0	0
Citeseerx	9	1	0
Wiley Online Library	13	4	4
Springer	5	1	1
Emerald	9	0	0
DOI	1	0	0
Pergamon	3	0	0
Proquest	3	0	0
SERSC	1	1	0
ACM	7	2	1
IEEE	14	11	11
Total	202	71	37

1

III. RESULTS AND DISCUSSIONS

This research has intended to investigate the components of e-learning framework for higher institution. The use of social media in higher institution has emerging a new opportunity and challenge both for basic functional usage or academic specific usage. Based on that, this study will identified the general component of electronic learning to define collaboration of social media and electronic learning,

that well known as social learning approach. In this section, this paper present a demographic and trend characteristics of "Selected Studies" literatures, such as source of publications, year of publications, classification of variable component and mapping of component e-learning and social learning from study literature. On Table 2, it shows journal id, title, year, type, and journal/conference name.

Table 2
Source of Publications

No	Title	Year	Type
1	E-Learning... [5]	2011	C
2	Blended ... [6]	2012	C
3	E-learning... [8]	2014	C
4	E-leaming ... [9]	2014	C
5	The design... [10]	2014	C
6	Flying ... [11]	2005	J
7	DAEL... [12]	2015	C
8	Assessment ... [13]	2014	C
9	A framework... [14]	2007	J
10	A flexible ... [3]	2006	J
11	Appraising ... [15]	2014	J
12	A Soft ... [16]	2011	J
13	Why people ... [17]	2008	J
14	A Semantic ... [18]	2005	J
15	Institutional... [19]	2009	C
16	A New ... [20]	2010	C
17	Towards ... [21]	2012	C
18	Quality ... [10]	2012	J
19	Critical ... [22]	2008	J
20	A New ... [23]	2011	C
21	Web 2.0 ... [4]	2012	C
22	Design ... [24]	2005	C
23	Service... [25]	2007	C
24	Critical ... [26]	2011	C
25	Illustrating ... [27]	2010	C
26	A Social ... [28]	2014	C
27	Learning ... [29]	2013	J
28	A conceptual ... [30]	2012	C
29	E-Learning... [31]	2011	C
30	An Investigation ... [32]	2005	J
31	A Design ... [33]	2002	J
32	Critical ... [34]	2007	J
33	Mobile ... [35]	2007	J
34	What ... [36]	2008	J
35	A social ... [37]	2012	J
36	An empirical... [38]	2008	J
37	Interaction... [39]	2006	J

The most of authors discipl⁸ expertise come from computer science (41%), while the others can be seen in Table 3. It can be concluded that e-learning topic is multidisciplinary concept between computer sciences, management education, information systems, and engineering.

The swiftness with which technology and social media evolves drives this research to find the components framework for e-learning and social learning to support the convergence among institution. According to study literature, there are 32 components of e-learning and social learning framework from 37 literatures; that can be used as a standard for build social learning model for higher institution. Table 4 shows the classification of component e-learning into variable and the classification of indicator for each component is defined.

Table 3
List of Authors' Discipline of Expertise

No	Discipline	#	%
Management			
1	Administration	1	1%
2	Business Administration	10	10%
3	Communication	6	6%
4	Economics and Business Administration	1	1%
5	Management	2	2%
6	Management and Human Resource Development	1	1%
7	Marketing	1	1%
8	Media Science	1	1%
Computer Science			
9	Computer and Mathematical Sciences	8	8%
10	Computer Education	1	1%
11	Computer Science	13	14%
12	Information Technology	4	4%
13	Institute of Information and Computer Education	2	2%
14	Sciences and Technologies	3	3%
15	Software Engineering	4	4%
16	Telecommunication	4	4%
Education			
17	Education	9	9%
18	Educational Technology and Communication	11	11%
19	E-learning and Learning Technologies	1	1%
20	Higher Education Institute	1	1%
21	Office of the Higher Education Commission	1	1%
Information Systems			
22	Information Center	1	1%
23	Information Management	1	1%
24	Information Systems	2	2%
Engineering			
25	Engineering	4	4%
26	Geography	1	1%
27	Architecture	2	2%
Total		96	

IV. IMPLICATION AND CONCLUSION

This study has two major implications for theory and practice. As a theory the result can be a reference for research in e-learning major. For the practice this result can be used to identify what the significant component in e-learning to support global social learning in higher institution. Observing the proliferation of component e-learning is useful for higher institution because many educators in higher institution are reluctant to define the core component from many varied model of e-learning. The flexible component learning presented can maximizes the integrating of digital and social media along with innovative cognitive pedagogy are able to change e-learning concept into social learning approach. Higher institution can create global social learning model where students can interact with others as virtual team members and collaborate knowledge with the other for whom they never know before [3]. The evaluation and indicator validation is very significant to conduct the e-learning components adoption on social learning impacts.

V. LIMITATION & FUTURE RESEARCH

Based on the component of model is identified, there are many emerging areas to be considered for future research. The result components only a conceptual components model for higher institution and there are many aspects of component e-learning framework to be refined. It has been a challenge to

organize the component, while there are many theories to support it but the number of database is restricted, so the amount of the papers limited to represent the fact completely. Therefore it needs extensive empirical testing using formal statistics to validate those components.

Table 4
The Classification of Variable

Variable	Component	Indicator
Infrastructure Provision [11] (A)	Appearance #(1)	The design and use of e-learning environment [5]
	Ease of Use #(4)	Local search engine [5]
	Hypermediality #(3)	Hypertext, hyperlinks [12]
	Learning Environment #(7)	Social interaction [40]
	Linkage #(1)	External links, affinity program [5]
	Structure & layout #(3)	Company profile/history site, customization, request for catalogue, learning information, learning highlight [5]
	Support #(9)	FAQs, complaining ability [5]
	Tool #(3)	E-Book, social media, streaming video [8]
	User Experience #(4)	Emotional dimension[12]
	Efficiency #(1)	Speed of downloading pages, online learning, ease of check out, elective course [5]
Performance [38] (B)	Reliability #(1)	Learning condition, ability to track learning status, customization possibilities [5]
	Performance System #(2)	Transformation process, input, output [16]
Technical Standard [14] (C)	Security #(1)	Account information, posted privacy policy [5]
	Technology #(18)	Learning with computer, learning from computer [6]
Self-Paced [22](D)	Individual Differences #(17)	Traits and states [6]
	Reinforcement and Motivation #(1)	Internal motivation, external motivation [8]
Institutional Development [40] (E)	Instructor #(14)	Learning output, learning process [8]
	Institutional #(4)	e-learning implementation, capacity building for e-learning [19]
Collaboration [10] (F)	Collaborative #(4)	collaborative environment [18]
	Cooperative Learning Community #(1)	social network and face to face meeting [10]
	Expert Community #(1)	social network and face to face meeting [10]
	Curriculum #(4)	Objectives of course [8]
Pedagogy [40] (G)	Evaluation #(6)	Formative evaluation, Summative evaluation, Assignments [8]
	Learning Technique #(7)	collaborative vs individual and self-paced vs instructor led
	Learning Outcome #(4)	skills, cognitive, affective, meta-cognitive [6]
	Pedagogy #(6)	learning scenarios [40]
Content Digital Stuff [40] (H)	Content #(10)	interactive online courses, tracked by the learning management system [20]
	Instructional Design #(5)	variety of structures and arranges of resources/procedures [15]
	Resources #(2)	human resources or supporters, and information communication and technology resources [8]
Social Context [14] (I)	Communication #(4)	e-mail and social circles [17]
	Culture #(4)	Social cultural background [14]
	Social #(14)	social distance, social responsibilities/roles and social prestige or status for e-learning contexts [14]

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