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E-LEARNING TRENDS, TECHNOLOGIES AND CASE INSIGHTS OF STUDENT E-READINESS FROM ETHIOPIA

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Abstract

The paper mainly aims to identify the Trends in E-Learning and its fundamentals, Explore the various Technology elements and Online Resources of E-Learning and to assess the Student E-Readiness of Online - E-Learning utilities and its impact on E-Learning Attitude in the Specific Case of Adigrat University, Ethiopia. To identify the Trends in E-Learning and its fundamentals and to Explore the various Technology elements, Online Resources of E-Learning, the paper has adopted descriptive and qualitative approach. To assess the level of Student E-Readiness and its impact on E-Learning attitude in the Specific Case of Adigrat University, Ethiopia, a mixed mode approach is adopted using secondary data (literature), qualitative and quantitative data. The quantitative study using questionnaire (Sample size = 209, Cronbach's α = 0.84) was conducted by convenient sampling.

Keywords: E-Learning, Trends, Technology, Online Resources, E-Readiness.

INTRODUCTION

The various forms of E-learning allow both students and business executives to learn anywhere and at any time. But there are fundamental differences between E-learning in the corporate sector and in education. The role of corporate training is to ensure an employee has the knowledge and skills to undertake a specific operation to enable an organization to continue to operate. Fundamentally, corporate training is centered on knowledge transfer and Training. In comparison with corporate learning, the education sector focuses primarily on knowledge transfer and not on training.

Several developing countries have been constrained in managing and sustaining significant strategies aimed at integrating ICT in education (Mikre, 2012). Although ICT has potential to create educational opportunities in more remote and rural areas, the integration of ICT in education is limited in developing country contexts owing to the shortage of qualified teachers, poor instructional material and

inadequate physical infrastructure (Grönlund et al., 2010). This has continuously widened the educational gap between urban and rural areas.

In this context of E-Learning discussion, there have been significant trends and approaches in the developed countries and started to be replicated in developing countries in Asia, Africa and other continents, and specifically the paper considers the Case of Ethiopia focused on Online E-Learning Readiness and its impact on E-Learning Attitude.

Objective of the Study

1. To identify the Trends in E-Learning and its fundamentals.
2. To explore the various Technology elements and Online Resources of E-Learning.
3. To assess the Student E-Readiness of Online - E-Learning utilities and its impact on E-Learning Attitude in the Specific Case of Adigrat University, Ethiopia.

Need for E-Learning & ICT in Higher Education

From Literature on E-Learning in developed countries and other Global perspectives, it is inferred that the demand for e-learning by various groups of users will push the education authorities and educational institutions to develop different forms of e-learning and implement new business models of universities. (Krasnova, Nuhuly and Teslenko, 2017).

Nicoleta and Maria-Loredana (2012), strongly propose that E-learning is one of the most efficient way to reach education at all levels, especially higher education systems. Multiple collaborative learning systems were implemented to improve people interaction, communication, working, coordinating activities, socializing and learning (Aparicio, & Bacao, 2013).

Tayebinik, & Puteh, (2012), conclude that blended learning (combination of E-Learning and other forms) can be considered as an efficient approach of distance learning in terms of students' learning experience, student-student interaction as well as student-instructor interaction and is likely to emerge as the predominant education model in the future. According to European Commission (2014), in its report on new modes of Learning in Higher Education, it has stressed the importance of Public authorities towards developing guidelines for ensuring quality in open and online learning, and to promote excellence in the use of ICT in higher education provision and also the integration of digital technologies and pedagogies should form an integral element of higher education institutions' strategies for teaching and learning.

Literature Review

E-Learning Overview & Definitions

E-learning, according to OECD (2005) is defined as the use of information and communication technologies in diverse processes of education to support and enhance learning in institutions of higher education, and includes the usage of information and communication technology as a complement to traditional classrooms, online learning or mixing the two modes.

Cabero, (2006) propose that the meaning of e-learning does not lie in its technical dimension (e.g. the platform used) but rather in the control and meaning assigned to a series of variables such as: how contents are presented, the role of the teacher and students, the synchronic and asynchronic communication tools used and their application in the teaching act, the didactic strategies used, the attention paid to organizational features, the e-activites provided, etc. With more and more learning through the Internet and a new way of learning has emerged which is named as integrated e-learning. (Changlin, 2009).

Modes & Elements of E-Learning

The term e-learning comprises a lot more than online learning, virtual learning, distributed learning, networked or web-based learning. As the letter "e" in e-learning stands for the word "electronic", e-learning would incorporate all educational activities that are carried out by individuals or groups working online or offline, and synchronously or asynchronously via networked or standalone computers and other electronic devices. These various types or modalities of e-learning activity are represented in **Table 1** (see also Romiszowski, 2004).

Table 1 – E-Learning Types – (Source: Romiszowski, 2004)

E-Learning Mode	Focus
E-Learning Online	Individualized Self-Paced
E-Learning Offline	Individualized Self-Paced
E-Learning Synchronous	Group - Based
E-Learning Asynchronous	Group - Based

Theories and Conceptual Frameworks on E-Learning, E- Readiness & Satisfaction

Aparicio, Bacao, & Oliveira, (2016), propose an e-learning theoretical framework based upon three principal dimensions: users, technology, and services related to e-learning. It also shows a typology of e-learning systems' services. This theoretical approach integrates learning strategies, technologies and stakeholders.

E-readiness is defined as the measure of the degree to which a community may be eager and prepared to make benefit of using ICT (Dada, 2006). According to Hale and Yasemin (2015), the factors that should be considered for e-readiness includes Individual properties, ICT Competencies, Access to Technology, Motivation & Attitude and Success Factors.

TAM has been widely used to predict user acceptance and use, based on perceived usefulness and ease of use. Davis (1989) and Davis et al. (1989) developed TAM by adapting the Theory of Reasoned Action (TRA) to understand the causal chain linking external variables to IT usage intention and actual use in a workplace. Adewole-Odeshi (2014), looked at the relationship between attitude and eLearning with the application of Technology Acceptance Model (TAM). Judit (2018) examined the determining factors of students' video usage and their learning satisfaction relating to the supplementary application of educational videos.

Research Model

Several models have been developed with the intention of explaining and predicting usage of information technology they include the theory of reasoned action, theory of planned behavior- TPB, technology acceptance model-TAM, theory of diffusion of innovation-DOI.

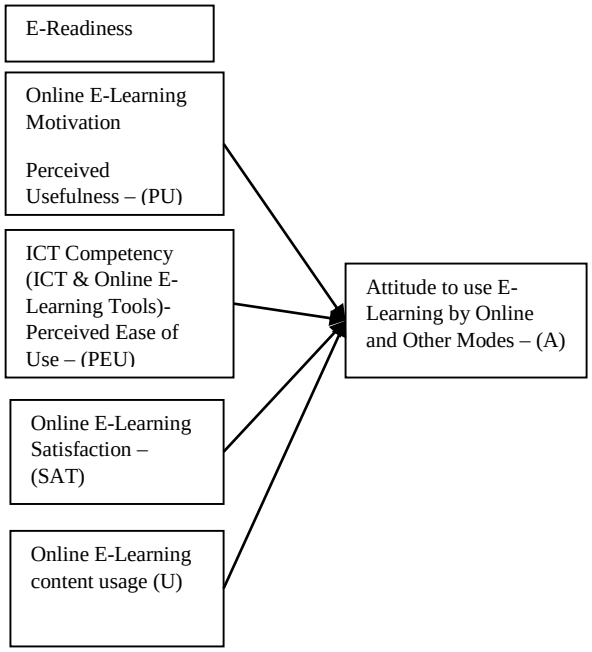

Fig.1- Conceptual Framework - Adapted from: (Judit 2018; Hale & Yasemin, 2015; Adewole-Odeshi, 2014)

This study used the Technology Acceptance Model (TAM) to explain students' attitude to E-Learning in selected Ethiopian universities (**refer fig.1**) and Online E-Readiness Dimensions (Hale and Yasemin et.al.) as predictors of the Students Attitude towards E-Learning (Judit et.al., Adewole-Odeshi et.al.). In this study the various constructs of E-Readiness Dimension are designed based on the student awareness level and usage of Online E-Learning Tools & utilities especially Search Engines, Social Media and Mobile Applications. The predictor construct is designed focused on Online E-Learning Readiness, since there exists no active E-Learning initiative at the University Level, except for the Student usage of Online E-Learning Content.

E-Learning Trends

According to Epignosis LLC (2014), the various trends in E-Learning is summarized in forthcoming section in

Table 2 - E-LEARNING TRENDS – (SOURCE: Epignosis LLC, 2014)

E-Learning Trend	Details
Blended learning	Blended learning is a combination of offline (face-to-face, traditional learning) and online learning in a complimenting way.
Social and collaborative learning	Collaborative learning is an e-learning approach where students interact socially interact with students, as well as instructors.
Gamification	Gamification is the use of game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems.
Micro-learning	Micro-learning involves learning in smaller steps, and goes hand-in-hand with traditional e-learning.
Video learning	Faster internet connections and the increasing use of gadgets means that using video in the e-learning process has become commonplace.
Rapid e-learning	Rapid e-learning is, essentially, a faster process of designing and developing online-based learning courses.
Personalization and e-learning	Personalized Learning is the tailoring of pedagogy, curriculum and learning environments to meet the needs and learning styles of individual learners.
Continuous learning	On a professional level, continuous learning is about further expanding our skill-set in response to a changing environment.

According to E-Learning Industry (2018), the top E-Learning Trends includes, Virtual and Augmented Reality - VR & AR (VR will continue to be used for teaching skills for handling high-risk tasks and performing complex procedures; AR will be used to trigger just-in-time learning e.g. Use of QR Code), Intelligent Assistants/Chatbots, Gamification And Game-Based Learning, Adaptive Or Personalized Learning Customized To Specific Learning Needs, Microlearning, Interactive Video-Based Learning, Social Learning, Workforce Enablement, etc.

Technology Elements, Online Resources and E-Learning

Male & Pattinson, (2011), presents a scenario for a mobile technology enabled learning environment in support of the conventional learning approach with a focus on enabling parental involvement and contribution to the daily learning objectives of their children and hence enhancing a quality learning experience. Similarly, Cheung & Vogel (2013), enhance the technology acceptance model to explain the factors that influence the acceptance of Google Applications for collaborative learning. In this context of Technology enabled E-Learning it is clear that m-Learning Technologies, Multimedia, Streaming Videos, networking technologies and Other Interactive tools

have impacted the E-Learning Indusrty drastically. (Abachi, & Muhammad, 2014).

Contemporary Technologies in E-Learning

Metadata and Knowledge Management driven Web-based Learning: In this approach, Metadata is used to satisfy requirements like reusability, interoperability and multipurpose. The system provides authoring tools to define learning methods with adaptive characteristics, and tools to create courses allowing users with different roles, promoting several types of collaborative and group learning. (Rego. Moreira, Morales.and GarciaHugo., 2010)

Adaptive E-Learning: Kostolányová, Šarmanová and Takács, (2012) introduces a complex plan for a complete system of individualized electronic instruction, called Adaptive E-Learning. The System automatically adapts to individual student's characteristics and their learning style; Also it adapts to static as well as to dynamic characteristics of the student with the application of adaptive study materials.

Cloud computing & E-Learning: Cloud computing is a new computing model which is based on the grid computing, distributed computing, parallel computing and virtualization technologies define the shape of a new technology & Future E-Learning. (Hosam F. E., 2013).

Webinar: Svetlana (2015), describes the possibilities of webinar software technology platform that define the teacher tools, such as audio and video in real time, slide show presentations, use of virtual board, screen sharing of teacher desktop.

Learning analytics (LA): According to Mohamed et.al., (2015), Learning analytics (LA) is a multi-disciplinary field involving machine learning, artificial intelligence, information retrieval, statistics and visualization. LA is also a field in which several related areas of research in TEL converge. These include academic analytics, action analytics and educational data mining.

Elearning 2.0.: E-learning is evolving with the World Wide Web as a whole and it's changing to a degree significant enough to warrant a new name: Elearning 2.0. (Downes, 2005).

Digital Learning Objects: Digital learning objects may include anything from a set of learning outcomes, learning designs or whole courses to multimedia and other forms of resources, as long as they are kept in electronic from. Digital learning objects, once they have been appropriately classified and labeled with metadata, are best stored in learning object repositories which can enable them to be easily located, shared and reused in a variety of educational settings. Digital learning object repositories are "the libraries of the e-learning era" (Richards, Hatala & McGreal, 2004, p. 242).

Content-authoring: Content-authoring tool is a software application used to create multimedia content typically for delivery on the World Wide Web. Content-authoring tools may also create content in other file formats so the training can be delivered on a CD (compact disc) or in other formats for various different uses. The category of content-authoring tools includes HTML, Flash, and various types of e-learning authoring tools.

SCORM: SCORM, or Shareable Content Object Reference Model, defines a specific way of constructing Learning Management Systems and training content so that they work well with other SCORM conformant systems. Basically, the different versions of SCORM all govern the same two things: packaging content and exchanging data at run-time.

TinCan: TinCan is an open source API that adds some needed extra functionality to SCORM and lifts many

restrictions of older specifications. The extra features provided by TinCan include simplicity, extra security measures, the ability to run courses outside the LMS, better support for offline and mobile learning and (potentially) more detailed reporting.

Common Cartridge (CC): Common Cartridge (CC) is proposed as an enhancement of SCORM offering more flexibility and addressing needs not originally envisioned, namely assessment and web 2.0 standards, content authorization, collaborative forums, outcomes reporting, accessibility. (Gonzalez-Barbone, & Anido-Rifon, 2010).

Online Resources and E-Learning

According to Deepali et.al., (2016), the various E-Learning Online Tools used in Higher Education includes Web Log (Blogs), Social Bookmarking (web-based service to share Internet bookmarks), Wiki (visitors add, remove, edit and change content, without the need for registration), RSS (web feed formats used to publish frequently updated digital content), Podcasting, Instant Messaging, Text chat and Internet forums.

According to Elearningindustry (2017), the various useful online learning resources from student perspective are summarized in below **Table 3** mentioning the top 5:

Table 3 - Online Learning Resources (Source: Elearningindustry, 2017)

S.No	Online E-Learning Resource	Description
1	EdX	From Berkley to Harvard, several courses will be found on this website. These education courses are offered to you free of charge.
2	Microsoft Virtual Academy	Courses range from IT, Cloud Computing, or all things internet. You can register in Microsoft Virtual Academy for some of the live events and follow a tutorial in real time.
3	Duolingo	If you aren't yet fluent in English, Duolingo will get you there. If you are already busy learning a second or third language, there are multiple tests you can take to help you improve your language skills.
4	Open Yale Courses	There are many online introductory courses through Open Yale Courses. You will be able to gain a lot of valuable information from these free courses.
5	Purdue Owl	This go-to guide will help you improve your writing skills immensely.

According to Getting Smart (2012), from the top 50 resources for online learning pertaining to master's degree program, computer science classes, a K-12 curriculum, or GED study program includes, the top 5 are UMass Boston Open Courseware, Khan Academy, MIT Open Courseware, Free-Ed and Learning Space.

I. CASE OF ADIGRAT UNIVERSITY – STUDENT E-READINESS AND ITS IMPACT ON E-LEARNING ATTITUDE

The student attitude towards E-Learning was assessed using a customized questionnaire instrument (Sample size = 209, Cronbach's $\alpha = 0.84$) using convenient sampling. The survey was undertaken with the students of College of Business and Economics, Adigrat University, Ethiopia.

The Descriptive Statistics indicate that the Mean Age (in Years) of Respondents to be 20.12 ± 1.55. The most preferred Social Media is found to be Facebook (86.1%) followed by Instagram and Others. And the most preferred Mobile Application is found to be IMO (34.9%),

Viber (29.2%), Telegram (19.6%), and other Apps constituted the rest. Amidst the drastic usage of Online utilities, surprisingly the respondents with Email Availability was found to be only 34.9%.

From the Regression Analysis it is inferred that the regression model best explains the student attitude towards E-Learning by 69.8 % (R2 = .698, F=117.816, σ = 0.000) based on the E- Readiness predictor variables designed in the conceptual framework namely, Perceived usefulness – PU, Perceived ease of use – PEU, Learning satisfaction - SAT and Online E-Learning content usage - U. (Refer Table 4)

Table 4 – Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.835[a]	.698	.692	1.19912

a. Predictors: (Constant), U, PEU, SATISFACTION, PU

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	677.626	4	169.407	117.816	.000[b]
	Residual	293.331	204	1.438		
	Total	970.957	208			

a. Dependent Variable: ATTITUDE

b. Predictors: (Constant), U, PEU, SATISFACTION, PU

Coefficients[a]

Model		Unstandardized Coefficients		Std.Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.899	.495		1.815	.071
	PU	.036	.038	.051	.965	.336
	PEU	.446	.038	.486	11.632	.000
	SAT	.280	.028	.475	9.972	.000
	U	.382	.106	.177	3.612	.000

a. Dependent Variable: ATTITUDE

From the evolved Regression Model, it is found that, the Student Attitude towards E-Learning, (A) = 0.486 * (Perceived Ease of Use of Online E-Learning Tools - PEU) + 0.475 * (Satisfaction of Online E-Learning Tools - SAT) + 0.177 * (Usage of Online E-Learning Tools - U).

References

1. H.R. Abachi, & G. Muhammad The impact of m-learning technology on students and educators. Computers in Human Behavior, 30, 491–496, 2014. http://doi.org/10.1016/j.chb.2013.06.018
2. Adewole-Odeshi, Egbe,. "Attitude of Students Towards E-learning in South-West Nigerian Universities: An Application of Technology Acceptance Model" (2014). Library Philosophy and Practice (e-journal). 1035.
3. M. Aparicio, F. Bacao. e-learning concept trends. In Proceedings of the 2013 International Conference on Information Systems and Design of Communication - ISDOC '13 (p. 81), 2013. http://doi.org/10.1145/2503859.2503872
4. M. Aparicio, F. Bacao, T.Oliveira. An e-learning theoretical framework. Educational Technology and Society, 19(1), 292–307, 2016. http://doi.org/www.jstor.org/stable/jeductechsoci.19.1.292
5. Cabero, J. Bases pedagógicas del e-learning. Revista de Universidad Y Sociedad Del Conocimiento, 3(1), 1–10, 2006. http://doi.org/ISSN 1698-580X
6. L. Changlin, & W. Kebao. Integrated e-learning. In 2009 International Conference on E-Business and Information System Security, EBISS 2009. http://doi.org/10.1109/EBISS.2009.5138005
7. R. Cheung., D. Vogel. Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning. Computers and Education, 63, 160–175, 2013. http://doi.org/10.1016/j.compedu.2012.12.003
8. D. Dada. E-Readiness for developing countries: Moving the focus from the environment to the users. The Electronic Journal on Information

Systems in Developing Countries, 27(6), 1-14, 2006.
9. F.D. Davis. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS quarterly, 13(3), 319-340, 1989.
10. F. Davis. R. Bagozzi, & P. Warshaw. User acceptance of computer technology: A comparison of two theoretical models. Management Science, 35(8), 982-1003, 1989.
11. P. Deepali, V.M. Wadhai,, V.M. Thakare. International Journal of Computer Science and Mobile Computing, Vol.5 Issue.2, February-2016, pg. 274-280.
12. F. Donkor, F. Assessment of learner acceptance and satisfaction with video-based instructional materials for teaching practical skills at a distance. The International Review of Research in Open and Distributed Learning, 12(5), 74-92, 2011. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/953/1891
13. S. Downes, E-learning 2.0. eLearn, 2005(10), 1. http://doi.org/10.1145/1104966.1104968
14. E-Learning Industry (2018). Top eLearning Trends For 2018 That eLearning Pros Need To Know. Accessed (24 Feb 2018) from: https://elearningindustry.com/elearning-trends-for-2018-9
15. Elearningindustry (2017). 10 Online Learning Resources You Need To Follow In 2017. Accessed (20th April 2018) from: https://elearningindustry.com/10-online-learning-resources-need-follow-2017
16. Epignosis LLC. E-LEARNING CONCEPTS, TRENDS, APPLICATIONS., FREE digital ebook.V 1.1, San Francisco, California, pp.69-87. 2014.
17. European Commission. Report to the European Commission on New modes of learning and teaching in higher education., Luxembourg, pp.55-56, 2014. doi: https://10.2766/81897
18. Getting Smart (2012). 50 Top Sources of Free e Learning Courses. Accessed (20th April 2018) from: http://www.gettingsmart.com/2012/09/50-top-sources-of-free-elearning-courses/
19. V. Gonzalez-Barbone, & L. Anido-Rifon, L. From SCORM to Common Cartridge: A step forward. Computers and Education, 54(1), 88–102, 2010. http://doi.org/10.1016/j.compedu.2009.07.009
20. A. Grönlund, N. Lim, & H. Larsson. Effective use of assistive technologies for inclusive education in developing countries: Issues and challenges from two case studies. International Journal of Education and Development using Information and Communication Technology (IJEDICT), 6(4), 5-26, 2010.
21. I. Hale & G. Yasemin. A Snapshot of Online Learners: e-Readiness, e-Satisfaction and Expectations. International Review of Research in Open and Distributed Learning., Volume 16, Number 2, 2015.
22. F.E. Hosam. The Impact of Cloud Computing Technologies in E-learning. International Journal of Emerging Technologies in Learning (iJET). 2013;8(S1):37-43 https://doi.org/10.3991/ijet.v8iS1.2344
23. T.N. Judit. Evaluation of Online Video Usage and Learning Satisfaction: An Extension of the Technology Acceptance Model. International Review of Research in Open and Distributed Learning. Volume 19, Number 1. pp 163, 2018.
24. K. Kaur & W.A. Zoraini. An assessment of e-learning readiness at Open University Malaysia. In: International Conference on Computers in Education, 2004.
25. J. Keller. Motivational design of instruction. In C. Reigeluth, (Ed.), Instructional design theories and models: An overview of their current status., (pp. 386–434, 1983). Hillsdale, NJ: Erlbaum.
26. G.A. Krasnova, A. Nuhuly., V.A.,Teslenko. E-learning: current state, trends and future prospects. Vestnik Rossijskogo Universiteta Družby Narodov. Seriâ: Informatizaciâ Obrazovaniâ. 2017;14(3):371-377. http://dx.doi.org/10.22363/2312-8631-2017-14-3-371-377
27. K. Kostolányová., J. Šarmanová. O. Takács. 'Adaptive e-learning and its evaluation', Journal on Efficiency and Responsibility in Education and Science, vol. 5, no. 4, pp. 212-225, 2012. https://doi.org/10.7160/eriesj.2012.050404
28. G. Male & C. Pattinson. Enhancing the quality of e-learning through mobile technology: A socio-cultural and technology perspective towards quality e-learning applications. Campus-Wide Information Systems, 28(5), 331–344, 2011. http://doi.org/10.1108/10650741111181607
29. F. Mikre. The roles of information communication technologies in education: Review article with emphasis to the computer and Internet. Ethiopian Journal of Education and Sciences, 6 (2), 2012.
30. A.C. Mohamed, L.D. Anna., S. Ulrik., T. Hendrik. A reference model for learning analytics. RWTH Aachen University, Ahornstr. Aachen, Germany, 2015. DOI: https://doi.org/10.1504/IJTEL.2012.051815
31. J.L.Moore., C. Dickson-Deane., K. Galyen. E-Learning, online learning, and distance learning environments: Are they the same? Internet and Higher Education, 14(2), 129–135, 2011. http://doi.org/10.1016/j.iheduc.2010.10.001

32. G. Nicoleta., P. Maria-Loredana. E-Learning Innovations in Higher Education. Challenges of The Knowledge Society. 2012;(2):1775-1787.
33. OECD (2005). E-learning in tertiary education [Online]. Available at http://www.cumex.org.(Accessed 27 /02/ 2014).
34. H. Rego. T. Moreira., E. Morales & F.J. GarciaHugo. Metadata and Knowledge Management driven Web-based Learning Information System towards Web/e-Learning 3.0. International Journal of Emerging Technologies in Learning (iJET). 2010;5(2):36-44. https://doi.org/10.3991/ijet.v5i2.1222
35. G. Richards., M. Hatala., R. McGreal. POOL, POND and SPLASH: Portals for online objects for learning. In R. McGreal (Ed.), Online education using learning objects (p. 237, 2004), London: RoutledgeFalmer.
36. A. Romiszowski. How's the e-learning baby? Factors leading to success or failure of an educational technology innovation, Educational Technology, 44(1), January-February, 5-27, 2004.
37. D.K. Svetlana. Webinar as a Form of E-Learning in Higher Education. Vestnik MGIMO-Universiteta. 2015;41(2):291-295.
38. M. Tayebinik & M. Puteh. Blended Learning or E-learning? International Magazine on Advances in Computer Science and Telecommunications, 3(1), 103–110, 2012. http://doi.org/10.1016/j.iheduc.2012.12.001