

IT Trends and Practices for E-Learning Development in Higher Education

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Abstract

This study focuses on hot, key and top recent trends of e-learning and its developments and the A proper diagram of these eLearning trends is designed for the universities which may keep a sharp look out for the short coming future particularly in higher education. The elements and quality approach of E-Learning are evaluated and Quality Assurance processes are set up. A framework for E-Learning Quality Assurance is designed in order to continue interest and investment in online learning. The results show postgraduate adult students can increase their learning path dramatically in an environment when provided information is only essential information enough to understand a concept; non-ambiguity, clearness and simplicity are the key factors. Predicting future hot trends and having a frame work for QA might be helpful in having successful in E-Learning processes in higher education.

Keywords: Development, E-Leaning, Higher Education, Quality Approach, Quality Assurance, Trend

1. Introduction

With advancement of technologies, brand-new techniques and strategies, constantly surfacing, e-learning and training are persistently growing and are reaching in advanced possibilities and are potential for universities. While new improvement in e-learning sector quickly boost, the universities assure some astonishing capabilities in their online training and exchange of information. Many universities are enforcing a few key directions for their training programs that suggest a trendy topic of exchange in the community of e-learning: bite-size e-learning¹⁹ (Bloggerzz, 2012), handled device apps, social collaboration and spreading higher education extensively globally with lowering cost. The boundless utilization of computers and the internet have changes distance learning an easier and faster approach, and today virtual universities and virtual schools deliver complete curriculum online. (Gold & Maitland, 1999)¹. The scope of Internet in supporting text, video, voice and immersion methods of teaching have made former specific forms of

radio, videoconferencing, telephone, television, and text based education fairly inessential. Nonetheless, many of the developed techniques and trends experienced with former forms of media are still widely used in Internet delivery²⁰ (Wambugu, 2015).

The objectives of present study are to identify recent and top trends of eLearning at universities. Another aim of this research is to design a framework of eLearning quality assurance.

Enrollment of students in online college courses have been increased 29% which is nearly one third of all college students enrolled; in other words, nearly 6.7 million students are currently joined online universities. (Major, 2015; Jaggars et al., 2013) ^{2,3}44% of post-secondary students in the United States took some or all of their courses online in 2009, which was proposed to grow to 81% by the end of 2014⁴ (Ambient Insight Research, 2009) While today, a large part of for-profit higher education institutions offer online classes, but only around 50% of the private, and non-profit schools offer such courses. Due to low cost, private institutions might have

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become more engaged with on-line presentations. Well trained staffs should also be hired to handle students' online⁵ (Repetto; Trentin et al., 2011). These associated staffs need to understand the content modules, and also be properly trained to operate the computer and Internet. Online education is growing rapidly, and online doctoral curriculums have even proposed at noted research universities⁶ (Hebert, 2007). Even though Massive Open Online Courses (MOOCs) might have restrictions that make it impossible for them to fully replace education system of a college, (Youngberg, 2012)⁷ such these arrangements have extremely expanded. Stanford University, Massachusetts Institute of Technology and Princeton University has offer such disciplines to a wide range of global students, but not as college credit. (Pappano, 2012)⁸ Programs in university-level, such as edX founded by Harvard University and MIT offer extensive range of courses for free, while other universities allow their students to audit a course for free but require a small fee for credentials. Even though MOOCs could not have a significant impact on classic higher education and shows sign of declination after the initial expansion, but still expected to survive in some forms⁹ (Kolowich, 2014).

Private sectors such as Udacity are also offering free computer science courses; other private institute, Khan Academy, is also offering over 3,900 free micro-lectures which are available via YouTube website. Distributed Open Collaborative Course (DOCC) suggested as a rival to MOOC, emphasizing on teaching in decentralized manner. (Scott, 2013) A non-profit accredited online university called University of the People offers such classes. Another private institute called Coursera offers online courses. Nearly over one million people have enrolled in free online courses globally, according to Fortune magazine¹¹ (Iris, 2013).

Zawacki-Richter have carried out a series of researches to explore the research domain of DE. The initial study¹² (Zawacki-Richter, 2009) utilized a Delphi technique to develop a classification of possible research extent. The second research carried out by Zawacki-Richter, B  cker and Vogt in 2009, identified priority areas and gaps and analyzed almost 700 articles which have been published in five notable DE journals during 2000-2008 period. The third study which have been conducted in 2010 by Zawacki-Richter and von Pr  mme focus on an analysis of the major impacts of collaboration paradigms and gender among researchers in research topics, research

productivity and research methods. Another study conducted by¹⁵ Gaebel et al. (2014) suggested that online courses and offered programs at most of the institutions is an answer to general pressure for more adjustable programs, as it targets various particular groups in several disciplinary domains and professional areas. However, flexible provision for employed students and professional students is absolutely in high demand. While at some of the institutions international students are selected as target group, but it seems that still globalization is not generally practiced in eLearning, whereas it was initially one of the main motives for the development of MOOCs¹⁵ (Gaebel et al., 2013).

Current study arranged as follows. First, the current trends of eLearning and its status at different universities are briefly reviewed and investigated in the literature section of this study and the future top trends are highlighted. Next section will deal with the discussion of the results, followed by the framework for QA. The major results of this study are configurated and future directions for further research are suggested in conclusion.

2. Materials and Method

This study was conducted in 2016. Remaining informed and up to dated in eLearning as an industry that's continually altering is tough, but being informed about the changes as they're arise can hold people at the forefront line. To help staying attentive and focused on the challenges of eLearning, trends and opportunities²⁶ (Graue, 2014), data were collected through literature review. The collected data were from subscribing to eLearning journals, keeping up with e-learners magazines, scanning and engage in forums and discussion boards, reading eBooks, newspapers and news sites, listen to/watching podcasts and videos on eLearning, networking, talking to e-learners and e-professors, observing the universities as competitors. Then, the key and recent trends of eLearning and its developments are collected and provided by noticing learners and prospects asking specific questions, questioning these alterations can guide the researchers through predicting possible opportunities and threats²⁶ (Graue, 2014). After, an evaluation of the elements and quality approach of eLearning, a quality approach was set up. To continue interest and investment in eLearning, a framework for eLearning Quality Assurance was designed.

3. Results and Discussion

3.1 Hot and Recent Trends of eLearning

An in depth examination of the current technology trends, can reveal tendency of the eLearning Industry. Responsive contents, automating web processes, and Gamification, are some of the current trends that people are discussing at universities' courses¹⁶ (Pappas, 2016). Implementing up-to-date changes help eLearning path admissible and approachable for contemporary learners and can enhance universities' allied online training blue-prints. The followings are hot and recent eLearning trends that the universities should consider to keep a sharp look-out for in the coming years¹⁶ (Pappas, 2016) particularly in higher education. (See Figure 1)

3.1.1 Authoring and Automation in E-Learning Course Development

Automation is fairly a recent topic in the eLearning community. Although a great number of tools designed for eLearning authoring are offering themes, templates and other online aids, but this year changes was a tremendous develop. (Pappas, 2016) ¹⁶A bunch of tools can now merge codes to automate the web processes. For example, these days you can establish an eLearning assessment and make an online game with least possible effort, or explore students' preferences in consideration of customizing all dimensions of their eLearning involvement automatically¹⁶ (Pappas, 2016). Right now, creating and

designing eLearning is still a very time consuming practice. Though it seems that this might be changing considerably in the near future. Solutions for creating automated content are advancing ever since, allowing designers of contents creating astonishing eLearning content with almost no effort²² (Gilligan, 2015). E-Learning contents that formerly take a long time in development phase, such as games, lesson's exercises, tests and quizzes now can be created utilizing automated tools. Matured solutions can scan the content of the course and decide what are the most important sections of the content which should be questioned in tests²² (Gilligan,2015). These advanced tools are greatly growing, and offering considerable cost and time savings in the eLearning content development²² (Gilligan, 2015). These solutions can offer a more personalized learning path through evaluating performance of students and their learning options. According to these information, the content of the course²² (Gilligan, 2015) (including tests) can be individualized.

3.1.2 Augmented Learning

While 2016 may not yet see an explosion of augmented reality use within eLearning, it is an area that is under intense development. Devices utilizing augmented reality such as Oculus Rift and Google Glass may become part of everyday life in the future and will surely become more popular in eLearning²² (Gilligan, 2015). The Apple Watch, Oculus Rift and Google Glass are only three out of hundreds of the wearable gadgets that booming the global market. Wearable gadgets can offer the chance for the learners to approach the subject more dynamically. These tech devices are also increase the accessibility and engagement of learners of eLearning, even those students who usually don't have enough time to pursue their classical academic training. Learners may have the opportunity to join virtual training environments and plunge themselves into purposeful eLearning games. In the near future. Augmented reality contains the ability to remarkably alter the whole industry of eLearning and effectively reconstruct the essence of online training. Scenario tools and 3D simulations are existed which can facilitate the process of designing eLearning content and dramatically reduce the cost. By the rapid advancements in sophisticated technology, it seems that Virtual Reality training (VR) is closer than ever¹⁶.

These devices allow environments to be adapted (virtually) to improve the learning experience. For example, an online course about astronomy could use augmented

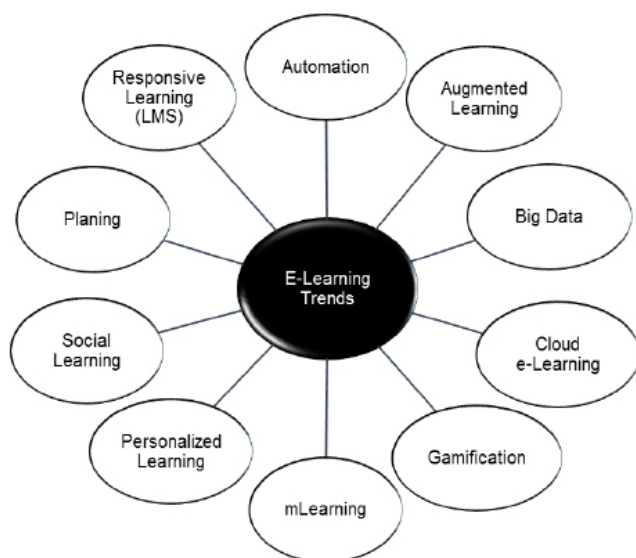


Figure 1. E-learning trends.

reality glasses to give a tour of the moon without the student having to leave their home or office. For a French class, the glasses could display a French classroom, better immersing the student in the language learning process. Augmented reality is still very much in its infancy, but the potential uses are fascinating.

3.1.3 Big Data

Big data is a very important subject, particularly in the field of eLearning in 2016¹⁶ (Pappas, 2016) and 2017. While analytic tools of Big Data are becoming highly developed, they tend to become much cheaper and easier to utilize²² (Gilligan, 2015). Big Data provides the ability to improve the eLearning contents, customize the whole eLearning activities, and achieve beneficial understanding of behaviors of learners and their preferences for the developers of eLearning¹⁶ (Pappas, 2016). Evaluating the learning data of respected organization and integrating these data with learning data of external sources will result an important understanding of e-learning framework and suggests methods to improve course contents and enhance the comprehensive strategy of eLearning. Through analyses of personal and group learning guidelines, targeted courses can be individualized in such a way that confirms the optimum learning outcomes for both the student and the organization in a broader view. Storing a huge amount of data and the advancement of analytics tools of Big Data will be greatly useful for the eLearning process. It seems that today is the very right time to start utilizing Big Data for the purpose of improving eLearning programs²² (Gilligan, 2015). Analytics of Big data can guide providers of learning contents to better realize the learning process through observing learner and group patterns and implementing a comprehensive assessment analysis, Learning providers will be capable of offering whole course customization and assemble an inclusive report of ROI for learning¹⁷ (Williams, 2015). Big data analytics offers profound promises for the field of eLearning and will come to consideration¹⁷ (Williams, 2015).

3.1.4 Cloud E-Learning

Clouds offer a better environment for all of the tasks, it applies to the field of eLearning too, and apparently is the reason behind the fact that most of the authoring solutions and Learning Management System are switching to cloud-based platforms. (Pappas, 2016) ¹⁶The report of eLearning market trends and predictions forecasted

nine percent growth each year in utilizing cloud-based authoring solutions and learning platforms in United States since 2011 ⁷³(Williams, 2015). Many organizations have already migrated to a cloud e-learning solution, but it seems cloud computing will tremendously come into consideration in 2017. Such organizations that hesitated to implement cloud based platform (generally due to concerns about security) are now switching to cloud²² (Gilligan, 2015). Universities decided to go toward cloud approaches benefitted from reduction of costs of online training and make their training more available for their students. Mentioned universities can calibrate the contents of their online training courses with ease and update the content almost instantly and add their brand new product features and specifications¹⁶ (Pappas, 2016). Benefits such as the additional functionalities, simplified maintenance and ease of use offered by cloud-based platforms will definitely discourage more organizations to switch to cloud platform²² (Gilligan, 2015).

3.1.5 Gamification

Gamification is a key trend for 2016 and 2017 but it is not a completely new trend. Incorporating game dynamics into an e-learning program can enhance learning outcomes significantly. Professionals admitted that implementing game potent onto non-gaming frameworks resulted fabulous outcomes – most notably, in convincing people to attain their projected aims. This factor efficiently can be utilized in the eLearning environments¹⁷ (Williams, 2015). Universities are recognized the importance of developing a successful strategy of gamification, particularly when unenthusiastic or unwilling associate learners are considered¹⁶ (Pappas, 2016). Gamification propose a promising approach to improve user commitment to learning contents – even some professionals assert that the technique can increase the motivation of the learner to an unbeatable 90% rate of remembrance. It's obvious, as soon as the learners accept a dynamic role in receiving knowledge, they will boost their opportunities at recalling it automatically¹⁷ (Williams, 2015). Studies suggested that gamification will be highly considered in 2017¹⁷ (Williams, 2016)

3.1.6 M-Learning

This phenomenon is largely impacted by the global booming of mobile technologies. Along with the expanded adoption of mobile devices a curiosity in m-Learning will emerge. Prominent industry professionals claimed that

mobile learning will dominate the e-learning market soon – even though this claim sounds resonant, the fact should be taken into consideration that mobile technology is indeed predicted to dominate many other domains too. In a nutshell, it may come true at the end. Now the question is what actually m-Learning is and what will be the outcome of it? Utilizing m-Learning framework, learners can reach all the realm of knowledge available at any time and place. They will take advantage of comprehensive learning obtained through micro-location technologies (such as GPS, QR codes, etc.) which will take back learning process into its initial context – also permitting for a better utilization of augmented reality technology¹⁷. (Williams, 2015)

3.1.7 Personalized Learning

All these mentioned trends point this fundamental vision – the advancement of personalizing all aspect of eLearning. (Williams, 2015)¹⁷ All dimensions of learning, scoping from education and training environments to learning solutions and educational programs will be custom-made to instigate, retain and motivate learners to obtain better outcomes in short term. It's obvious that 2017 can be a progressive year in eLearning world. The main focus can be on developing a customized framework of learning by adapting the steps of instruction, taking the advantage of learners concerns, allowing students to select their own training path and adapting content delivery by selecting videos, images and text or mentors will be capable of delivering their course content in more effective methods. ELearning is also considered as a considerable source of income. Professionals anticipated the astonishing US\$27.1 billion revenues by the end of 2016 for eLearning solutions in the United States¹⁷ (Williams, 2015).

One thing that comes up with most of the trends discussed above is that of personalized eLearning:

- Automated eLearning tools are already using (big) data to create a more personalized learning experience.
- Cloud eLearning solutions allow individuals to study at times when it suits them best and from wherever they feel most comfortable.
- Using social media for learning allows the individual to enhance their learning experience in whichever way helps them most.

It's highly probable that eLearning will comprehensively alter the approach to education, knowledge administration and training methodologies in 2017¹⁷ (Williams, 2015).

3.1.8 Responsive Learning Management Systems (LMS)

Responsive design contents are widely available on various frameworks and devices. Significantly, authoring tool and the Learning Management System will maintain the eLearning contents, from text pieces to images, according to the size of screen and resolution automatically. This guarantees that every single student receives the same eLearning contents and will take the same advantages of eLearning course. When it comes to select the ideal responsive Learning Management System preferred which includes a built-in preview and customizing engine. Mentioned features acknowledge the user to obtain an overview of the selected eLearning content on various handled device screens, and then alter specific elements manually to enhance the beautifications and eLearning material navigation¹⁶ (Pappas, 2016).

3.1.9 Social Learning

The application of social media is not just sharing birthday photos²² (Gilligan, 2015). Social media can also be used as an efficient individual training tool. It is already utilized for connecting people that work crosswise global groups or inside the corresponding organizations inside the same industry²² (Gilligan, 2015), contributing and deliberating ideas, and collaborating on identical projects. Social media can help learning through various disciplines. For instance, in an eLearning course, Facebook groups can be used to share material topics²² (Gilligan, 2015) and facilitate student interactions without the need of being at the same place. Another social media²² (Gilligan, 2015), Twitter can be used to get in touch with subject matter professionals, fire discussions and elaborate compelling contents about the eLearning materials. It is estimated that social media will play an ever more vital role in education during 2016 and coming years²² (Gilligan, 2015).

3.2 Elements and Quality Approach

ELearning quality assurance is necessary for continued interest and investment in online learning. Adequate eLearning quality assurance is the reason why eLearning professionals have created frameworks that can be used to assess elements that contribute to the factors influencing effective learning outcomes. This includes mainly 4 elements within eLearning development¹⁸ (Majumdar, 2016):

3.2.1 The Curriculum

A strong curriculum should be created for learners keeping in mind its relevance in the workplace. It should be updated and reflect best practices that would help learners perform better within the workplace and beyond.

3.2.2 The Learning Design

E-Learning developers have to create an effective learning environment that not only provides required information, but also provides engagement that ensures effective learning.

3.2.3 The Delivery Processes

Technology-aided learning can create a strong support system to sustain long-term learning by providing ample opportunities of communication and collaboration.

While the above is the framework that forms the e-Learning quality assurance, there are various checks and measures that developers can take to ensure that the framework is strong and delivers effective e-Learning.

The researchers designed a framework for E-learning Quality Assurance for 2017 in order to have an effective learning and its development, and continuing investment. As shown in Table 1 present E-learning Quality Assurance Framework includes four major sections: Curriculum, Design, Production, Implementation, and Evaluation/Optimization.

As shown Figure 2, the Components and Quality Approach can be evaluated in IT training and process in three dimensions by assessing simplifying, noon-ambiguity, and clarity.

3.2.4 Interactivity for Engagement

Learning can change into a boring process, specifically when it comes to utilization of “pure” technology-aided learnings. Students do not have the chance¹⁸ (Majumdar, 2016) to talk about and fully in depth discuss the thoughts with other students or have challenging discussion of issues; this used to be a constant issue for e-Learning providers and developers. In-built interactivities inside the e-Learning platform can efficiently grant comfort while challenging the learners to think and practice comprehends learning. Several interactivities can be built in an e-Learning course such as multiple-choice questions, fill in the blanks, match-the correct answer, and true or false. Straightforward and understandable interactivities inspire factual and theoretical learning for a vast array of students²⁴ (Pathak, 2010).

3.2.5 Visual Design

E-Learning developers should pay attention to the use of font, space, color, graphics, and multimedia. (Majumdar, 2016) This puts the learner at ease and minimizes cognitive overload. Graphics and figures have been always played a vital role in learning and obviously e-Learning too walk on the same shoes. In addition of only embellishing the “look and feel” dimensions, images and graphics can improve learning in a broader view. A prevalent look that contains graphics in a learning module is an assured method of allaying monotony and delivering contents in just a “white space” is no longer in use. For some e-Learning courses having minimalistic graphics is considered as normal; while for others, natural significances of learning

Table 1. E-learning quality assurance framework

General condition	Design	Production	Implementation	Evaluation/Optimization	Requirement	Introduction
<ul style="list-style-type: none"> Analyzing the external content Analyzing the individual resources Analyzing the targeted group (Kiyani,2014)	<ul style="list-style-type: none"> Learning objective The content Concept Educational concept/ methodology Activities and Roles Organizational design(Kiyani,2014) 	<ul style="list-style-type: none"> Implementation of design Realization of content (Kiyani,2014)	<ul style="list-style-type: none"> Administration Activities Review of level of competence (Kiyani,2014)	<ul style="list-style-type: none"> Planning Implementation Evaluation Optimization (Kiyani,2014)	<ul style="list-style-type: none"> Initiating Identifying stakeholders Defining objectives Needing analysis (Kiyani,2014)	<ul style="list-style-type: none"> Test learning resources Adapting learning resources Releasing learning resources (Kiyani,2014)

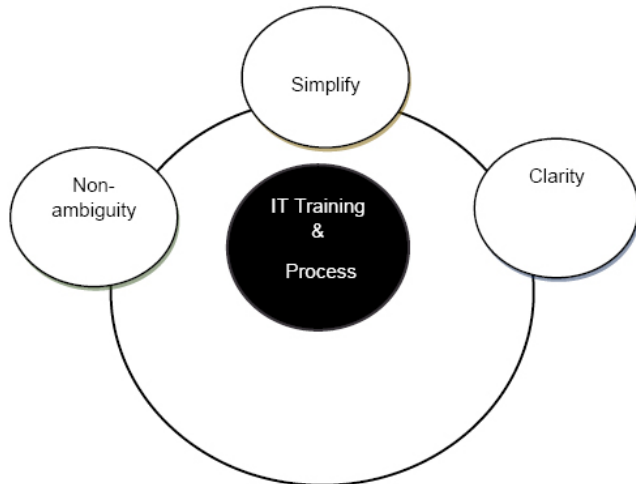


Figure 2. Evaluation of components & quality approach.

can be built and improved rather than being only a companion to the actual content or text based materials.

3.2.6 Logical Structure

The structure of the e-Course should not be deterrent to learning. Navigation must be simple and consistent throughout the course. (Majumdar, 2016) ¹⁸ ELearning content should be logically structured and made searchable so that learners can access it better.

3.2.7 Adequate Technology Support

There is a lot in terms of delivery of eLearning that one can employ. (Majumdar, 2016) ¹⁸ Considering the vast development in technology, sky is the limit! But eLearning delivery should be created intelligently keeping in mind the needs of the learners as well as available technology. For instance, for the sales force, it makes sense to create an eLearning course that is delivered via mobile devices and consists of short audio learning snippets that they can hear and learn anywhere. The same strategy cannot be adopted for a group of factory workers in a manufacturing set-up who need to learn about the working of complicated machinery. For them, a 3D enhanced graphics heavy course is more appropriate.

3.2.8 Course Content

The eLearning content needs to be well thought-out, concise, and consistent. It is a known fact that learners do not prefer to read too much when they learn in a self-paced manner. Therefore, eLearning should not be

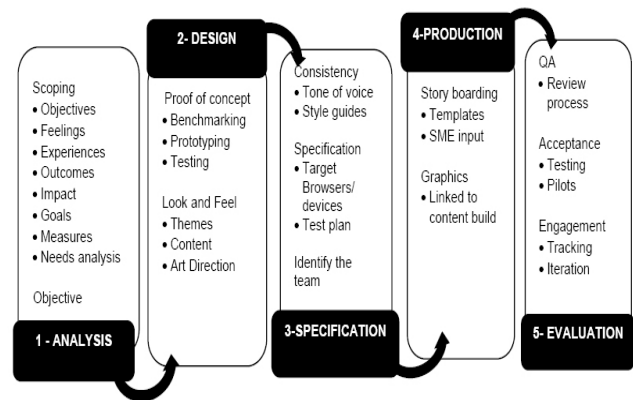


Figure 3. Setting up QA process.

too complicated and there should be a constant effort to make difficult concepts easy to understand and detailed information lay out in smaller nuggets that are easier to consume. It is necessary to take the extra efforts to make the learner feel confident with the course content and its ability to create value. Make sure that there are no typos, alignment and spacing of text are consistent, as well as here is a consistent editorial style followed through the entire course content. The content itself should be strong and relevant. It should provide required perspectives and should have conceptual strength to create knowledge¹⁸. (Majumdar, 2016)

E-Learning is an effective way of learning, but it definitively has associated price tags and needs various requirements¹⁸ (Majumdar 2016). It is important to be able to please associates and assure that eLearning is offering the most probable return of finance and that additional investment is guaranteed¹⁸ (Majumdar 2016). With well demonstrated eLearning quality assurance, this can be very well achieved.

3.3 Setting Quality Assurance Processes

After evaluation of the elements and quality approach of eLearning, a Quality Assurance processes is set up for eLearning in higher education. (See Figure 3)

This process includes five phases for successful eLearning production: Analysis, Design, Specification, production, evaluation.

4. Conclusions

The principal objectives of this research were to identify and introduce recent and top trends of eLearning at

universities. Hence, the researchers suggest and design a 9-unit set of hot trends in eLearning within higher education including Automation, Augmented learning, big data, cloud eLearning, Gamification, m-learning, personalized learning, social learning, and Responsive learning. This study also designed a framework of eLearning quality assurance which contains 7 major sections e.g. general condition, design, production, implementation, evaluation/optimization, requirement and introduction. All these sections have been described and given directions one by one. The results demonstrate that higher education students can have the maximum rate of learning when just the necessary pieces of information required for fully understanding of a concept are supplied to these students; clearness, absence of complications and clarity are the crucial factors. It is not necessary to give information as much as an IT engineer and developer. It is unrequired to make e-learning environment complicated to the e-learners and give complex information and unnecessary further details. Also, knowing and predicting future hot trends and having a frame work for QA can clarify and simplify the path of success in eLearning of higher education. Based on identified recent trends of eLearning, it is recommended to focus on planning to extend eLearning in future study.

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