

Using Blended Learning to Foster Education in a Contemporary Classroom

Ali Massoud, Umar Iqbal, Denise Stockley, Queen's University,
Aboelmagd Noureldin, Royal Military College of Canada / Queen's University

Authors' Contact Information

*Ali Massoud, Umar Iqbal,
Electrical and Computer Engineering Department,
Queen's University, Canada
email: ali.massoud@queensu.ca*

*Denise Stockley
Centre for Teaching and Learning,
Queen's University, Canada*

*Aboelmagd Noureldin
Electrical and Computer Engineering Department,
Royal Military College of Canada / Queen's University*

Abstract:

A new era of technology is bringing promising prospects, accompanied by numerous new challenges for educators. Traditional methods, such as face-to-face teaching, are experiencing substantial transformations by utilizing these innovative technologies, many of which are instructional tools. To understand the complimentary opportunities and challenges, it will be beneficial to understand the new tools primarily based on computers, multimedia, internet and online interactive techniques. Leading contemporary solutions can be classified firstly as e-learning, an asynchronous technique using only innovative technologies without a real class for teaching, and secondly as blended learning, employing mixture of synchronous and asynchronous techniques by means of both face-to-face, online, and offline methods for instruction. This paper briefly reviews the different stages of admittance of new tools as a means of instruction based on the literature and our own experience with blended learning. Analysis of contemporary solutions, e-learning and blended learning will be presented along with their strengths and limitations. This paper suggests schemes to merge innovative technologies with traditional techniques that include design assessment, financial, technical and human requirement. Authors recommend keeping the spirit of traditional techniques alive without losing the extra edge that can be accomplished by augmenting traditional techniques with the latest technology development. Furthermore, it is an effort to encourage readers to brainstorm further to take full advantage of different techniques to enhance educational experience of the learner.

Key Words:

Blended Learning, technology for teaching, e-learning, multimedia, online interactive techniques.

Introduction

In the late 1990s, electronic learning (e-learning) technology was applied in many educational institutions. E-learning transformed the traditional classrooms into virtual classrooms using local area networks or the World Wide Web (henceforth web). At the onset, many people liked e-learning and some even called for the replacement of the traditional classrooms by virtual ones. Experiments and scientific research has since demonstrated drawbacks of e-learning including the fact that it is very expensive to implement and it reduces face-to-face interaction between the student and the teacher. Moreover, a person needs to be trained for discussion and exchanges within a hypothetical environment. To conquer the limitation of e-learning, a combination of traditional technique augmented by innovating technologies is suggested, resulting in a blended learning format. Blended learning broadens the traditional face-to-face classroom interaction by adding the domain of modern technology.

This paper provides an overview of ingress technology in academia. It then discusses the uncertainties and limitations associated with e-learning for students and teachers and draws attention to a lack of enthusiasm for its implementation by institution. Blended learning is introduced after discussing e-learning. To comprehend the potentials of blended learning this paper examines the overall design that includes analysis of the target group, assessment of basic knowledge of students, content analysis and financial necessities. In conclusion, a few technical and human requirements are discussed for ways to accomplish blended learning format in an optimal way.

An Overview of E-Learning

In early 1980's, the computer industry and multimedia organizations started to constitute e-learning as a reality (Charp, 1997). Companies and educational institutions were steadily hiring instructors to train their students. In higher education, teachers had just begun to use PowerPoint, a program that allowed people to create visually enhanced presentations. They were also able to play explanatory videos that could assist student learning during the class. This period was referred to as Computer-Based Training.

Mainstream online education launched in the mid 1990's (Hall, 2000, and Herrington, Reeves, & Oliver, 2005). This was when the internet was a great success, and multimedia was elevated to another level. Although online education courses were valuable for students, they also had some problems. Online education was very sluggish, as pictures were small and the entire course was text based. Nevertheless, it was beginning to catch the eye of many. Since 2000, e-learning was finally on the map, as online education courses were becoming more popular at colleges and businesses (Campbell, 2004). Great streaming media, online video access, and fast web site servers made online education feasible. Students were also now able to learn from their

homes on their own time, making it easier for those who were working and studying simultaneously.

Rationale of E-learning

Advanced techniques and improved methods with global access to the internet are now challenging traditional methods of face-to-face learning. E-learning has crossed all borders by providing the opportunity for institutions to offer their programs to those near and far, even to those in remote towns, thereby augmenting the circle of influence, not to mention profits. The total number of educational programs offered online is difficult to count. For example, one study indicated in 1994–1995 academic year, there were an estimated 753,640 students enrolled in courses delivered online at two- and four-year institutions in the United States (Newman and Scurry 2001). In 2003 surveys and polls show that demand in the United States was “exploding”; 1.9 million students were enrolled in online courses offered at the 1,170 institutions surveyed in the fall of 2003, 19 percent more than a year earlier, and expected to have grown an additional 24 percent, to 2.6 million, by the fall of 2004 (Carlson 2004; Carnevale 2004). All over the world, traditional institutions are delivering some of the courses in their curricula online, or are planning to do so (Gürüz, 2011). The 2010 Sloan Survey of Online Learning in the United States reveals that enrollment rose to by almost one million students from a year earlier. The survey of more than 2,500 colleges and universities United States finds approximately 5.6 million students were enrolled in at least one online course in fall 2009 (Allen & Seaman, 2010).

Globally, students are free from daunting formalities such as obtaining a student Visa, travelling to faraway places, and arranging for hostels and so on, as lectures and exams are waiting for them in their own homes. There are demands for universities to “provide for a larger and more diverse cross-section of the population, to cater for emerging patterns on educational involvement which facilitate lifelong learning and to include technology-based practices in the curriculum” (Hicks, Reid, & George, 2001). E-learning lectures are often composed of recorded lectures which are often accompanied by PowerPoint slides and augmented with reading materials. Features like online discussion boards, live question and answer sessions made e-learning more pragmatic and useful. In a few institutions, instructors are now hired to solely teach online. For many, it is a great opportunity because this method provides more knowledge to the end user. According to Kraglund (2010), online teaching skills can be acquired swiftly and with observed pedagogical benefits; because of this, we should support this approach.

E-learning: Uncertainties, Hassles, and Limitations

E-learning brought excitement along with uncertainties. These uncertainties exist for both students and faculty. This may include student views of the course, fear of virtual classrooms, and limitations of student involvement and participation as one is not physically present in the classroom. When an instructor is approachable, the student may consider her/him more dependable and realistic. For an instructor it remains a presumption that he/she has conveyed the information effectively and that the student has the background knowledge that is essential to understand the presented information (King, 2002). Miscellaneous tools are available for students to interact with

and it is quite tricky to find an optimum technique that will bring the greatest level of comfort (McGorry, 2003). There are a number of barriers to online learning and according to Maor and Volet (2007) these can be listed as follows: a) institutional inexperience in developing online courses, b) apparent inadequate instructional support and communication, and c) insufficient participants for computer literacy. According to Allen and Seaman (2007), other barriers include a lack of support from faculty for online learning instruction and the high costs of developing online courses/programs. Some faculty members are apprehensive that teaching online takes more time than face-to-face instruction, and one has to be occupied with learners on an hourly basis daily, rather than only during specific times each week. Students have also reported that face-to-face instruction takes less time than e-learning. Some suggest that classroom instruction provides a more appropriate learning environment, state of mind, and the ability for learners to focus on their learning.

E-learning demands self-discipline to give the required attention to the presented material and to stay away from a wide range of distractions such as family or professional obligations. These interruptions often occur when you are away from a typical classroom scenario (Garrison, & Anderson, 2003). The tasks of instructors intensify as e-learning demands detailed course instructions in particularly structured sequence and timely responses to questions regarding lectures, assignments and exams.

At higher levels of learning, discussions between different points of view, provide a healthy platform of dialogue between students and instructors. Discussions improve the aptitude of argument with logic, manner of expression of knowledge and communication skills. These talks provide supplementary details while serving as an excellent tool to enhance the understanding of subject matter with various illustrations. Arguments help the students evaluate and analyze the evidence, brainstorm the ideas and improve decision-making skills. These discussions on the one hand provide better understanding of different opinions; on the other hand, they improve the ability to hear and understand contradictory ideas that can lead to innovations in the field and can serve as an instrument of integration for the class. However, it is the teachers' responsibility to handle the argument in an encouraging manner and to guide it towards productivity.

Maintaining decorum in the classroom during conflicting debates in an e-learning environment is an intimidating task for instructors. These uncertainties compel e-learning instructors to sometimes avoid discussions, which compromises the quality of learning. Compared with the drawback of entirely web based courses, where all the course material is in the form of recorded lectures, PowerPoint presentations and handouts, a blended course is a combination of both face-to-face and online environments (Garrison, and Kanuka 2005).

Introduction of Blended Learning

Blended learning can be principally straightforward but still relatively multifaceted. Blended learning is straightforward as it is expansion of traditional face-to-face classroom education (synchronous) by augmenting it with internet-based learning experiences (asynchronous). However, blended learning is multifaceted as choosing a suitable proportion for face-to-face and internet-based learning, the appropriate

selection of tools used for learning activities remains an overwhelming responsibility. There are not any fixed ratios of synchronous and asynchronous in blended learning classrooms that may be considered to be correct or incorrect. The main aim is to advance the learning experience by using a blend of face-to-face and internet-based learning environments. Instructors should have a firm foundation of the subject, an acquaintance with most modern tools to present the material in a comprehensible and interesting manner, an ability to engage student attention by allowing them to think more critically. The focus of blended learning is to increase student knowledge and interaction using traditional and contemporary techniques, which makes learning more effective. It strengthens the skills of black and white communication that results in profound and organized thinking without losing face-to-face contact. Students value a strong, active presence by the instructor during the course, especially in discussion groups. Students highly appreciate the added wisdom that the instructor's perspective brings to their discussions with other students, while monitoring and channeling the discussions onward in the online environment.

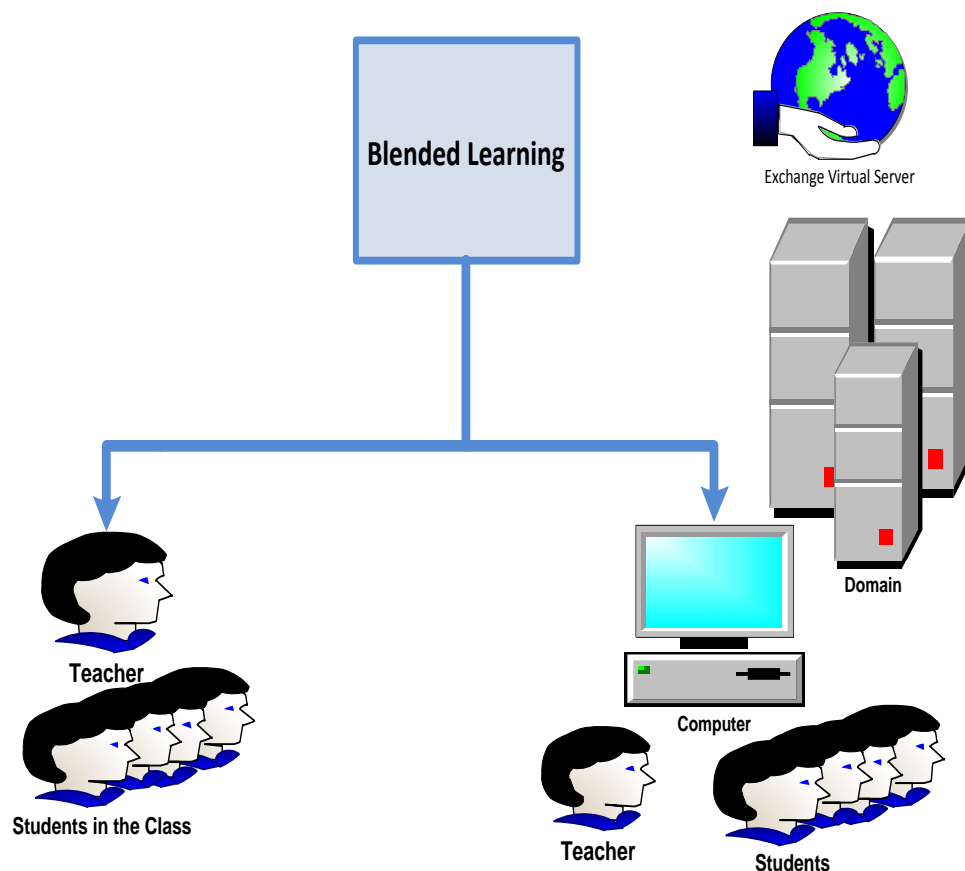


Figure 1:
Blended learning - face-to-face classroom education augmenting with Internet-based learning experiences

The potential and of blended learning was well recognized by the former President of Penn State University as he commented about blended learning as “the single greatest unrecognized trend in higher education today” (Young, 2002). The blended learning is the most appropriate way to educate the current generation of post-

secondary students or the so called “net generation.” According to Berk (2009), net generation students want to express their opinions via live and online methods. Blended learning is supposed to encourage students to share their ideas and opinions through discussions, collaborative exercises, social media networks and digital storytelling forums and blogs.

Blended Learning Challenges

Progress in science have created several prospects to replace the traditional classrooms with new media; however, there are several limitations of fully functional digital environments for instructions, as well as for learning which are compelling academia to look for innovative solutions. Blended learning accomplishes the most useful aspects of both the traditional classroom and e-learning environments in the context of a specific educational setting (Garrison, and Cleveland-Innes, 2003). Time, location, materials used and peer contact are the limitations of the traditional classroom. On the other hand, an e-learning environment is not confined to such limits largely and this allows for an optimization of conditions of learning on a unique level.

The art of blended learning is to find a smooth and powerful combination of online and offline components and instruction. Blended learning is not entirely dependent upon e-learning modules and whatever is presented within the digital method itself. Blended learning provides a combination of components (asynchronous and synchronous) that needs to be a complete match for the module’s learning objectives and the capability of the interaction between the components requirements to be fully applied. For instance, a teacher may ask the students to go through the theory of a certain topic on their own, utilizing e-learning methods. Students and teachers can focus on the foremost aspects of the topic in the class. This will give them an opportunity to review sections of the theory that has proven to be problematic. Subsequently, relevant assignments solved by the class can be discussed in meeting sessions and it will allow the students to learn from each other’s mistakes. According to Heterick and Twigg (2003), typically, a large enrolment course could be replaced with multimedia lessons, tutorials, and reducing the traditional lectures to one or two lectures per week, with any combination of online discussion groups, simulations, discovery labs, assignments, research projects, quizzes, and digital content. Discussion and analysis are important tools for brainstorming and decision making, which are vital parts of blended learning. More face to face classes at the start of the session can bring a sense of association and confidence that is imperative for open discussions. Unlimited access to information on the internet with modern means of interaction provides students with the forum to precede the discussions with rationale and judgment, which is helpful for integration and unification of the class. Teacher presence is important to keep the healthy atmosphere both synchronous (i.e. verbal) and asynchronous (i.e. written) online communication. This provides a distinctive edge to blended learning as it is using both forms of interaction, and thus, it is supporting higher levels of learning through critical discussion and reflective thinking.

Design of Blended Learning

A blended learning program must begin by outlining clear objectives for the schedule of the requisite work, and determine what the students must learn by the end of the

program. Based on these objectives, it must take into account the options available for the new process of the design, analysis and operation. They include the following:

Analysis of the Target Group:

Analysis of the target group is essential for verification of the options available to knowledge transfer, which will be more effective in achieving the objectives of specific performance. To achieve this analysis, the following key factors must be considered:

Basic Knowledge Assessment:

The instructor and course design team should be aware of the knowledge level of the students; i.e. what students know beforehand. Instructor can employ numerous strategies such as pre-tests, aptitude tests and self-assessments to determine it. Pre-tests present intuitive evaluation of how well developed each student is in their knowledge and skills for the course. An evidence of the students' attitudes and level of thinking can be attained by aptitude tests. Self-assessments provide a glance of students' abilities in specific areas and level of perceptive even during the course of studies.

Favorite Learning styles:

It is identified that the style of learning is exceedingly dependent on the student's background. Research has demonstrated the importance of understanding brain behavior as it relates to learning styles and personality traits. Studies revealed that brain hemisphericity greatly influences the individual's learning style (Saleh, 2001) and all kinds of intellectual and personality characteristics (Boyle & Dunn, 1998; McCarthy, 1996; Torrance, 1982). Identical preferred learning styles are observed for students of similar academic backgrounds; for example, students from the commercial and sales sectors tend to gravitate toward the forms of cooperative, visual and verbal learning. Conversely, students from information technology and communications sector prefer realistic, concrete and individual learning.

Content Analysis

Content analysis leads to determining the most suitable means for the knowledge transfer. In blended learning program design, we must take into account the impact of using different means on learning process while choosing the methods of interaction between the target group and lecture content.

Some forms of content (for instance, convoluted behavioral sciences and complex physical skills) cannot effectively be learned except through the direct face-to-face training. It is important in this case to recognize the nature of the content, in order to adapt the program design according to it.

Financial Analysis:

The financial analysis of the cost of both the content development and selecting the appropriate method of delivery plays an important role on the decision-making. Contemporary technology is shifting the scenario, once delivering programs that work offline (for examples on CDs or memory sticks) was considered to be secure, economical and easier in its implementation than the methods based on live formats. However, live format programs that were once considered to be vulnerable and

expensive are becoming more popular due to global access of high data rate internet with latest reliable encryption technologies.

Blended Learning Basic Requirements:

An integrated system is necessary for the accomplishment of effective blended learning. The basic requirements of blended learning can be classified as following:

Technical Requirements:

Clearly defining the course contents help to lay out the technical requirement. Few technical requirements that institutions should provide can be listed as:

- An accessible website that may include text, images, audio, videos, and animations. To make it more effective, it should be customized to be accessible to the people with disabilities
- Online course schedules, reading material, lectures and assignments in logical sequence
- Electronic Evaluation (e-evaluation) such as online quizzes, assignments and exams
- Access to discuss the content with the teachers e.g. live chat or blog or meeting
- Coherent conjunction of virtual classroom should be established with the traditional classroom in order to complement each other. Virtual classrooms are defined as any online area in which instructors and students “meet”, via their computer connections, for course activities

To make the blended learning more effective, Learning Management Systems (LMS) are introduced in order to document, track, and report of training programs. Learning Management Systems (LMS) also provide automated and centralized administration that can optimize the schedules for students, instructors, and classrooms.

Human Requirements:

Human requirements (student and teacher) represent the antipodes of the educational process as both has a role, no less important than the other, to contribute to accomplishing the goals blended learning

Teacher:

The role of the teacher is more challenging in online learning as they have to create an atmosphere and connection between a virtual instructor and the independent student. This virtual instructor takes the role of the traditional instructor in class sessions. There are several methods that are mentioned in Doherty (2009) to increase the teachers' capabilities for teaching with technologies in a pedagogical manner. Imperative abilities that a teacher should possess for blended learning can be listed as:

- Profound vision to design course content for synchronous and asynchronous learning objectively
- Mastery in traditional teaching skills and the capability of administer these skills into e-learning environment in an optimized manner

- The ability to correspond effectually via e-mail and on-line discussion or blog
- Updating the course contents as per contemporary research in the subject area
- Creating a spirit of participation and interactive in the synchronous and asynchronous classroom
- Competence to design self-assessment tests that supplies formative evaluation for teacher and act as means to check the student's basic understanding of the subject to improving programs. Moreover, these self-assessment tests should act as self-assurance mechanisms for student that they are on the right track
- Provide an opportunity for students to use knowledge and competence in diverse issues

Student:

In blended learning, students need to understand that their participation in the educational process is essential and they must feel that they have an important role in order to interact with their peers and the teacher. The students should:

- Be able to discuss in the class the main points of e-lectures and to categorize hard to comprehend points
- Prepare to join a group for solving in-class assignments that needs thorough understanding of the lectures
- Be ready to assess others and to be assessed by others in the assignment group
- Be comfortable in dealing with e-mails, on-line discussions and blogs
- Assess oneself regularly using self-evaluation tests to identify the weak areas and acquire self-assurance even before attending the class

Conclusion

In conclusion, the main objective of this research is to suggest a better educational environment for students and instructors. To address these transformations a two-pronged strategy needs to be developed, one for students and another for faculty. An environment, where students feel welcomed, ready to get engaged in conversation, a sense of belonging and accomplishment, along with the motivation to develop an aptitude to raise questions. A teacher's role should not remain limited to deliver the lectures, but to develop the minds of the students by presenting various viewpoints and making connections between them, addressing the student question explicitly and summing up the conversation. A vital step will be training for both student and teacher in order to obtain an effective communication between them. These types of initiative are vital to keep the world of pedagogue aligned with the dynamic world of technology. Blended learning will assist in a smooth expansion of traditional synchronous learning augmentation with modern asynchronous learning, making instructions effective and helping students to get profound learning experiences.

Acknowledgements

We would like to thank Dr. Anita Jack-Davies for her comments on earlier drafts of this paper.

References

- Allen, I., & Seaman, J. (March 2007). *Online nation: Five years of growth in online learning*. Needham, MA: Sloan Consortium. Retrieved from: http://sloanconsortium.org/publications/survey/pdf/online_nation.pdf
- Allen, I., & Seaman, J. (2010). Class Differences: Online Education in the United States, 2010 (ID: CSD5973) October, Retrieved from http://sloanconsortium.org/publications/survey/class_differences
- Berk R. (2009), Teaching strategies for the net generation. *Transformative Dialogues: Teaching & Learning Journal*, 3(2).
- Boyle, R.A. & Dunn, R. (1998). Teaching law students through individual learning styles. *Albany Law Review*, 62, 213-255.
- Charp, S. (1997) *Some reflections. (the 30-year history of computers in education)*. [Technological Horizons in Education]. *T.H.E. Journal*, 24(1), 8-11.
- Campbell, L. (2004). *What does the "e" stand for?* (Report). Melbourne, Australia: Department of Science and Mathematics Education, the University of Melbourne.
- Carlson, S. (2004). On-line education survey finds unexpectedly high enrollment growth. *Chronicle of Higher Education*, 51(4): A30. November.
- Carnevale, D. (2004). Distance education: Keeping up with exploding demand. *Chronicle of Higher Education*, 50(21): B8. January.
- Doherty I. (2009), Faculty Transformation: Three Forms of Inquiry to Increase Staff Capability for Teaching with Technologies. *Transformative Dialogues: Teaching & Learning Journal*, 2(3).
- Gotschall, M. (2000). E-learning strategies for executive education and corporate training. *Fortune*, 141(10), S5, S59.
- Garrison, D. R., & Kanuka, H. (2005). *Blended learning: Uncovering its transformative potential in higher education*. *Internet and Higher Education*, 7, 95–105.
- Garrison, D. R., & Anderson, T. (2003). *E-learning in the 21st century: A framework for research and practice*. London, GB: Routledge/Falmer.
- Garrison, D. R., & Cleveland-Innes, M. (2003, September). *Critical factors in student satisfaction and success: Facilitating student role adjustment in online communities of inquiry*. Invited paper presented to the Sloan Consortium Asynchronous Learning Network Invitational Workshop, Boston, MA.
- Gürüz, K. (2011). *Higher education and international student mobility in the global knowledge economy*. Albany, NY: State University of New York Press.
- Hall, B. (2000). New study seeks to benchmark enterprises with world-class e-learning in place. *E-learning*, 1(1), 18–29.
- Hamilton, D. (2008). Towards a Scholarship of Teaching, Learning and Leadership: A Case Study on the Use of Course Evaluation Data to Promote Collaborative Faculty Engagement. *Transformative Dialogues: Teaching & Learning Journal*, 2(1).
- Heterick, B., & Twigg, C. (2003, February). The Learning MarketSpace. Retrieved from: <http://www.center.rpi.edu/LForum/LM/Feb03.html>
- Hicks, M., Reid, I., & George, R. (2001). Enhancing on-line teaching: Designing responsive learning environments. *The International Journal for Academic Development*, 6(2), 143–151.
- Herrington, J., Reeves, T., & Oliver, R. (2005). Online learning as information delivery: Digital myopia. *Journal of Interactive Learning Research*, 16(4), 353–367.

- King, K. P. (2002). Identifying success in online teacher education and professional development. *The Internet and Higher Education*, 5(3), 231. doi: 10.1016/S1096-7516(02)00104-5
- Kraglund-Gauthier, W. L., Chareka, O., Murray Orr, A., & Foran, A. (2010). Teacher Education in Online Classrooms: An Inquiry into Instructors' Lived Experiences. *The Canadian Journal for the Scholarship of Teaching and Learning*, 1(2).
- Maor, D., & Volet, S. (2007). Engagement in professional online learning: A situative analysis of media professionals who did not make it. *International Journal on E-Learning*, 6(1), 95–117.
- McCarthy, B. (1987). The 4mat system: Teaching to learning styles with right/left mode techniques. Barrington, IL: Excel, Inc.
- Newman, F., & Scurry, J. (2001). *Higher education in the digital rapids. The Futures Project. October*. Retrieved from <http://weblib.in.ua/sites/weblib.in.ua/files/pdf-db/digitalrapidsreport1.pdf>
- Saleh, A. (2001). Brain hemisphericity and academic majors: A correlation study. *College Student Journal*, 35 (2), 193-200
- Torrance, E.P. (1982). Hemisphericity and creativity. *Journal of Research and Development in Education*, 15(3), 29-37.
- Young, J. R. (2002, March 22). 'Hybrid' teaching seeks to end the divide between traditional and online instruction. *The Chronicle of Higher Education*, A33.