

Bridging the Digital Divide in Undergraduate Business Information Systems Education

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Abstract

This paper presents some of the more-effective techniques of teaching with the philosophy of providing undergraduate Business and Management students the required computer skills and foundation for subsequent courses in Business Management Information Systems. Traditional academic learning techniques cause undergraduate faculty significant challenges as they fail to adequately engage the digital gaming generation. The generational gap between the baby boomers and the gaming generation has created a new digital divide and requires teachers to rethink about how they are presenting material in the classroom. The traditions of brick-and-mortar classroom teaching approaches are in dire need of improvements to bridge the ever-widening digital divide between the professor's instructional methods and the expectations of the "digital gaming teenager". A Management Information Systems course was designed with the above challenges and solutions in mind. The course introduced the use of computers, basic information system concepts and the management of information technology to support effective decision making. A number of success strategies included Web Based Assignments, Research Report and Presentation, On-line Testing, and Industry-based Case Studies. Analysis of this experiment induced the authors that the effective educational instruments were those that appealed to the students with creativity, challenges and continuous feedback. This paper concludes that educators need to develop new teaching methodologies and learn how to engage this new digital gaming generation while providing the students with both the soft skill sets and technical knowledge required for the global competitive market.

Keywords: information systems, gaming generation, On-line Testing, teaching methodologies, case studies, undergraduate education, soft skills, computer skills.

1. INTRODUCTION

Commonly understood, learning is defined as the process by which people acquire new knowledge for enhancing their abilities, and

skills to improve their performance (Rosenberg 2001). In adopting traditional academic learning techniques, undergraduate faculty are faced with significant challenges, since these techniques fail to ade-

quately engage the digital gaming generation of learners.

The generation gap between the baby boomers and the gaming generation is manifested by a digital divide, and requires teachers to rethink how they present material in the classroom (Simpson 2005). There is a gap between the methodologies of traditional pedagogy and the expectations of fully engaging undergraduate students to participate in the academic environment.

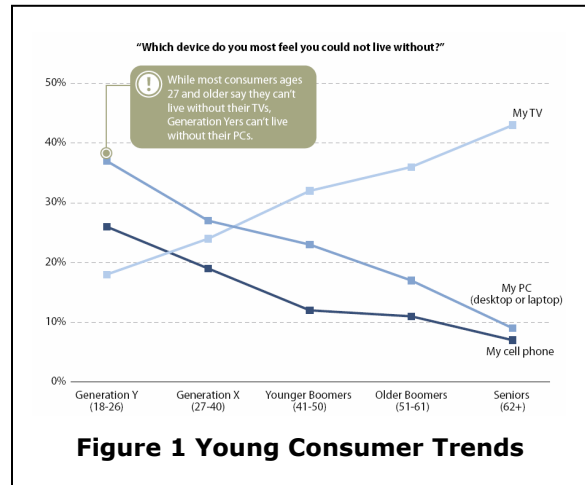
The purpose of this paper is to examine the current learning methods in order to understand their effectiveness with the digital gaming generation. There is a need for IT educators to create a classroom environment that includes a diverse number of learning styles, interactive exercises, and discussions to foster critical thinking, engagement, enthusiasm and learning.

The structure of this paper begins with background information and then delves into an examination of traditional teaching methodologies for satisfying the learning needs of the gaming generation. Next, it describes the experiences gained from teaching an information management course, and then it discusses the strategies for success using a real-world case study. This paper also presents the analysis and evaluation methods for conducting this research and opportunities for improvement. The paper concludes with lessons learned and recommendations.

2. BACKGROUND

Over ninety percent of American children, age two to seventeen, have regular access to video games, with the size of the gaming generation estimated at over 90 million people in the United States alone (Beck, Wade 2006). The current undergraduate student is part of the "gamer generation", and as teenagers, many have played electronic games 20 plus hours a week (Wankat, Oveovicz 2005). The average 21 year old has played over 10,000 hours of video games, and nearly seventy percent of students learn best actively and visually (McLester 2005). The typical middle class teen-age student has a laptop or at least a PC, and an array of digital lifestyle devices such as an MP3 player, a PDA, a cell phone, a digital camera and an Xbox or Play station (DeCanter 2005). Consumers between the ages of 18

to 26 state that their desktop PCs and laptops are devices they cannot live without, and cell phones rank second as their most important electronic device, as illustrated in Figure 1 (Schadler 2006).



This generation has developed intuitive computer skills, and their preferred learning style is essentially inductive learning without formal instruction. They are hands-on interactive learners who think doing is more fun than studying; they have little need to read instructions and have been conditioned to the "trial-and-error" approach of rapid feedback and consequences learned from computer games (Wankat, Oveovicz, 2005). The digital gamer generation spends hours in instant messaging, and half the population of the United States plays video games. The elements of interactive gaming, adaptations, competition and communication are becoming the traits of successful students and workers (DeKanter, 2005). "The current generations of learners are a generation of privilege who have grown up with ready access to technology and are capable of multi-tasking many technologies at one time. They are very capable of thinking quickly, being creative, handling multiple stimuli and utilizing technology, but at the same time, they are easily bored" (Beard, Schwieger, Surendran, 2007).

Clearly, the tradition of brick-and-mortar classroom teaching approaches are in dire need of improvement to bridge the ever-widening generation gap, or digital divide, between the professor's pedagogy and the expectations of the "digital gaming teen-

ager". The gaming generation are unhappy in school, they are not challenged and they are bored (Simpson 2005). It is concluded that curricula for undergraduates should incorporate new teaching approaches that appeal to the digital gamer generation, and faculty must understand student expectations in order to support their learning more effectively.

There are also new challenges and requirements to properly educate knowledge workers of the future. To adequately prepare students to thrive in the emerging global knowledge society, educational changes are required with new "approaches to learning that both fit current economic realities and are more attuned to the socio-cultural, psychological and spiritual needs of an emerging global knowledge society" (O'Hara, 2007). Higher education needs to be responsive to the needs of the changing world and the global marketplace by providing students with the skill sets required to keep our society competitive. The rapid pace of change of information turnover and obsolescence require changes to what we learn and how we learn. "Learning to learn becomes a core competency and learning how to harvest information from multiple sources, just in time, will be more important than accumulating a body of knowledge" (O' Hara, 2007).

3.0 COURSE OVERVIEW

A Management Information Systems course was designed to address some of the challenges mentioned in Section 2. The intent was to lead the students in self-managed learning, fostering the skills and habits that could enable them to be successful in the field of IT, and develop an understanding that learning is a continuous life long process. This course should provide the foundation for subsequent management information system courses in the curriculum of undergraduate business students.

The syllabus included topics of an introduction to the use of computers, basic information system concepts, and the management of IT to support effective decision making. The targeted audience for the course included both working professionals in industry and full time college undergraduate stu-

dents, with ages ranging from twenty to forty years of age. One hundred twenty students attended the three sections of the course offered in a term, with an average registration of 40 students per section.

Goals of the course were to provide the students with understanding of the following topics:

- Why information systems are essential to business and society.
- The application of IT toward achieving business goals and objectives.
- The foundations of information systems, particularly with respect to personal computer hardware and software, including Microsoft Office products and Internet usage.
- Concepts of the software development life cycle, project management, relational databases, web development, operating systems, computer networks and security.

Specific objectives of the course included:

- Examining how IT may be used, designed and managed to support effective business decision making.
- Providing students with an understanding of topics, such as the fundamentals of telecommunications, business processes, information systems development, application tools, the use of the Internet, and software development life cycle.

The course was web facilitated with faculty providing the primary lecture materials, and leading class discussions, supported by the Blackboard™ Learning System. The Blackboard™ website was utilized for posting the syllabus, course announcements, lecture material, class assignments, on-line examinations and student grades. On-line feedback for assignments and test grades were also provided via Blackboard™ and individual email to students.

4.0 Success Strategies

Success strategies discussed in this section describe the efforts exerted toward establishing web-based assignments, preparing a research report and presentation, online testing, and an industry case study.

4.1 Web Based Assignment

The assignment required students to develop a web site for a dental office, which provided the following information: hours, services, staff information, emergency contact information, and external links to other dental web sites. One graphic image or photo on each web page were to be included, the web site were to contain a minimum of three linked web pages, and links to other useful web sites for dental patients. To support this assignment, students were provided with lecture material about the format of html files. The students were given the ability to use either text editors such as Notepad to create the html file or web creation tools such as Microsoft Front Page.

The web based assignment provided students with a hands-on learning experience and reinforced lecture materials regarding e-commerce, web languages, and internet usage. The graphical nature of the assignment, the technical challenge of learning web development languages, and the challenge of planning and organizing the format and content of the web pages provided high student motivation. The students were provided with a greater appreciation of course content utility and a skill set, which is directly applicable to the business world. This course assignment provided a problem centered learning activity, which fosters hands-on activity to produce solutions beneficial to the real life applications, and is a successful and effective learning environment (Laware and Walters 2004). The web assignment engaged students in an active learning experience that allowed them to implement methods beneficial to e-commerce business applications.

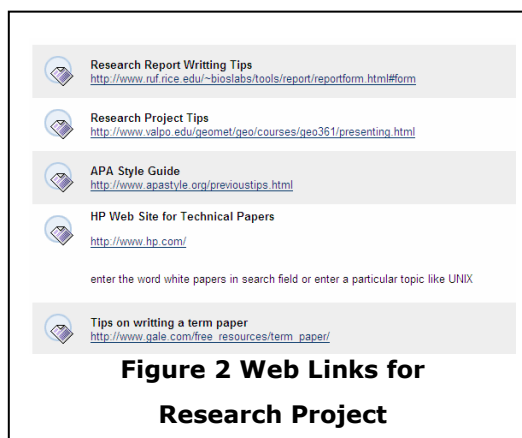
4. 2 Research Report and Presentation

IT courses must help the student become knowledge workers, by developing the skill sets necessary to become independent learners who can identify information needs, utilize technology to gather, organize, and analyze information to solve problems (Miertschin & Willis, 2003). Additionally, employers of IT graduates have requested that educators place an increased emphasis on soft skills of speaking, writing and interpersonal communications (Howard, 2005). In addition to high technical knowledge, and the basic IT competency skills of internet

usage and search skills, employers also expect the additional value skills or soft skills for the IT professional which include teamwork, communication, oral and personal presentations, project management, leadership and problem-solving. The goal of the research project and class presentation was to provide students with the opportunity to develop the internet usage and library resources search skills and to provide an opportunity to develop presentation and communication skills.

Students had the entire semester to develop both the research report and research presentation that assisted in their development of time management and project management skills. The syllabus instructed each student regarding the requirements for a research report and class presentation on a current IT business trends or IT business standards. The research report must have consisted of at least three technical references and should range from 700 to 1000 words. The project presentation should be a PowerPoint slide presentation of approximately ten minutes. Each student was given an opportunity to present their topic and facilitated a question and answer session with the class.

Since this was the first IT course for undergraduate students the Blackboard™ web site posted the useful web site links as shown in Figure 2 to assist the student in developing their research report and presentation.



The research report and presentation provided the following learning opportunities to the class:

- Utilization of the library and internet search engines for technical references to encourage students to maintain and improve their knowledge.
- Gave students exposure to a wide range of diverse topics related to IT.
- Prepared students for industry by providing an opportunity for developing soft skills of communication and improving their presentation skills. The student received an email within two days describing the grade for the research presentation, the appropriateness of the topic to the course, and suggestions for improving the student's presentation style.

Students enjoyed the ability to present and discuss the results of their research with the class and the class benefited by the wide range of topics and interesting subjects, which were discussed including the following:

- New York Stock Exchange Electronic Trading : Under John Thain, CEO, the NYSE has acquired the electronic exchange Archipelago in December 2005, become a publicly traded company in March 2006, and acquired the Euronext Exchange that is comprised of numerous European Bourses which was finalized on April 4, 2007. With the utilization of electronic trading and the two recent acquisitions results in cost savings predictions are for \$200 million in 2005 and 2006 and another \$475 million in 2007 (Bruno J. B., 2007). The NYMEX already uses an intranet that allows traders on the stock exchange floor to use tablet pc's to enter orders. An extranet for sellers is already in place this allows sellers and market makers to execute sell orders from remote locations. The issue of EDI is of the utmost importance in this situation. The data of the world's financial markets requires maximum security. The recent actions taken by the NYSE Group, Inc and their future plans, truly impact the global financial marketplace.
- IT project management - Organizations implement change to become more competitive by using projects, which are temporary endeavors undertaken to accomplish a unique product or service.

Project Management is the application of knowledge, skills, tools and techniques to project activities in order to meet project requirements. Project management is the development and implementation of a plan and includes the project phases of study, planning, implementation, evaluation and support/maintenance. A project manager performs many activities including organizing work, assigning tasks, directing activities, estimating and allocating resources, obtaining material and human resources. Advantages of using a formal project management system include better control over the companies financial, physical and human resources, improved customer relations, lower costs, shorter development times and higher quality.

Project Management is a growing field in the business world. More than 16 million people in the U.S. regard project management as their profession. The job of IT project manager is in the list of top ten most in demand IT skills and Project Managers, on average, earn more than \$82,000.00 per year. The global economy, internet and increased competition have fueled the growing need for project management, recent trends in project management, research, certification and software products.

- E-Commerce Initiatives for Medical Prescriptions: Electronic Prescribing (e-Prescribing) is the ability to electronically transfer data from a physician's office to the pharmacy. Thru Electronic Data Interchange, the doctor can enter a prescription with his computer; send it to the pharmacy via the Internet. The advantage is that a pharmacist no longer would have to decipher a physician's handwriting. The doctor would select the drug from a database containing all of the available drugs. Included in the database would be all pertinent medical information related to that individual drug, including side effects, possible drug-to-drug interactions, and warnings regarding appropriate lab tests that should be performed when using certain medications. The potential for improper dosages would be significantly reduced and it would reduce the risk of death and injury since there are approximately

7,000 deaths and approximately 1.5 million Americans injured annually from incorrectly dispensed prescriptions.

Though cost is a big factor in preventing e-Prescribing from becoming universally available, it is not the only consideration. The technology is in its early stages, and it is important that all of the participants needs be met. All physicians must be able to communicate with all pharmacies. In order for this to be successful, infrastructures must be built to accommodate all players. There are also federal regulations that must be addressed, and rules from state to state will vary, which will complicate the standardization of the data exchange in that each state will need its own rule set.

- **Wireless Networking and Security:** 200 million Americans, which is more than 65% of the U.S. population, own and use some variety of wireless networking. Wireless networking eliminates the need for cables to communicate by using radio or light waves in an air medium to transfer information. These waves are sent between wireless access points and wireless clients. A wireless access point is a base station that is attached to the wired network. A wireless client is the network interface in computer devices such as PC's, PDA's, or cell phones that communicate with access points. Every wireless device has serious security issues. The information being sent through the air is susceptible to outside attacks. Although intercepted private information is a huge security concern with wireless voice and messaging devices, it is not the only concern. It is also possible for these devices' signals to be intercepted and for the device's ID numbers (Electronic Serial Number and Mobile Identification Number, or ESN/MIN) to be cloned. Consequently, thieves could bill their own transactions to this stolen ESM/MIN.

Personal Digital Assistants and internet-enabled cell phones (smart phones) are handheld devices that can connect to the internet across a digital wireless network. These devices employ services such as email, news, messages, stock quotes, and simple transactions. Others

linked to the same public wireless network can monitor another PDA's activity and gain access to files. A solution to accessing private information is using a virtual private network (VPN). "This sets up a secure 'tunnel' for the transmission of information between the traveler and the home office. Encrypting all e-mail before transfer will prevent others from reading this information. Many different attacks may occur among voice and messaging systems, handheld systems, and data networking systems. However, they do occur most often in the data networking systems of WLAN and Broadband. Specifically, Active Eavesdropping, Man-in-the-middle Attacks, and DoS Attacks may be the most damaging and hardest to thwart.

In Active Eavesdropping, attackers listen to all network traffic, hoping to find unencrypted networks. In a Man-in-the-middle Attack, the attacker is able to get the data packets before the intended receiver. An Address Resolution Protocol allows the attacker to redirect network traffic through their device and then change the content of the transfer. A Denial of Service (DoS) attack uses frequency devices to send continuous noise on a specific channel to ruin network connectivity. A constant network security station is the only way to substantially prevent these attacks.

The overall benefits of the research project and presentation are:

- It provided students with the ability to learn about the application of technology to business contexts.
- Students were given the opportunity to develop their research skills, their communication skills, and their presentation skills.
- A broad diverse subject matter of topics were presented, including history of popular web sites such as Yahoo and Google, Airport Security, The High Cost of Spam, Identity Theft, Usage of Social Networking Sites, ITIL IT Infrastructure Library, EDI - Electronic Data Interchange, ERP - Enterprise Resource Planning, XML - Extensible Markup Language, CPU technology comparison from Intel and AMD, and High Definition Graphics Cards for Gaming Applications.

- Students were allowed wide latitude in selecting their topic, topics were approved and modifications were suggested by the faculty prior to actually initiating the research activity.
- The combination of a research report and presentation provides students with an opportunity to experience all four learning styles of reading/writing, visual learning through the development of the graphical presentations of materials, aural learning by listening to other presentations, and kinesthetic learners who learn by doing with subject material that was relevant to the course topics and interesting to the student. Students were more interested and engaged in the research project presentations since the presentation material included class discussions and was more interactive (Howard 2005).

4.3 On-line Testing

A midterm and final exam based upon the lecture material from the text book were given and the exams were open book. The utilization of Blackboard™ for exams, which consisted of fifty multiple-choice questions, was mutually beneficial to the students and professor. Students were given several days to complete the exam utilizing the blackboard software, and could schedule their exam around their other courses, family life and work schedule.

The Blackboard™ software provided the students with the feedback of correct answer or incorrect answer; it allowed the student to take the exam twice, providing the student with the opportunity to improve their grade. The use of Blackboard™ for testing purposes provided immediate and automatic grading feedback to the student and the professor, which was very beneficial and time saving considering the number of students registered.

4.4 Case Studies from Industry

The faculty provided newspaper clipping about identity theft at a retail store chain, articles about the newest announcement from Microsoft about the Vista operating system and case study reports from Forrester Research about Supply Chain operations

at IBM and the Wal-Mart Approach to IT. Other relevant information provided to the students included Automotive E-commerce lecture material, software development life cycle and project management methods utilized by industry and computer security. Students could relate the theory of the text book and the lecture material to the industry case studies.

One class topic presented the Illustration shown in Figure 3 for the 1956 IBM 4.4 Megabyte Disk drive and asked student to rate the size and the cost of their own personal memory sticks. This was an effective means to illustrate the principle of Moore's Law and engage the student's participation. The 1956 IBM 4.4 Megabyte disk drive weighed over 1 ton and was used by the 305 RAMAC computers, which was the first computer to have a hard disk drive. In contrast the memory sticks can store 4 gigabytes of data, which is 1000 times more storage capacity, two inches long and weighs only one ounce.



Figure 3 IBM 1956 4.4 Megabyte Hard Disk Drive

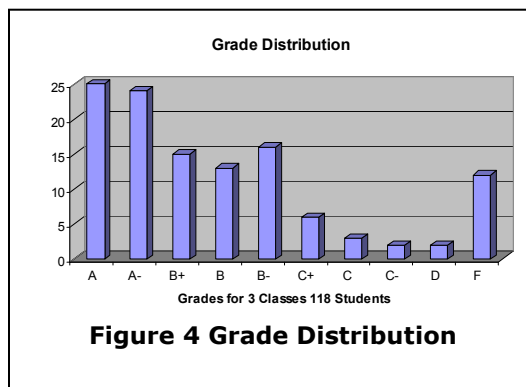
5.0 Analysis

Those education instruments, which were effective with the student population, were

those that provided creativity, challenges and immediate feedback. Students were more engaged in the material that was interactive. The web development page and on-line testing enabled the student to see the results of their efforts and challenged their skills, knowledge and creativity. The web development and on-line testing activities provided students with the type of learning environment the digital gaming generation excels at, one where the consequences of their actions is immediately displayed, they have the ability to make decisions and changes interactively and have immediate feedback. Furthermore, development of web pages presented the student with opportunities to express creativity using clip arts and graphic images. It also fostered a spirit of competition in terms of showing their web presentation abilities.

The game generation loves multitasking, being immersed in data and gamers want to be heroes (Beck, Wade, 2006). The research assignment and report provided students with a task, which provided immediate public feedback and instructor praise, which appeals to their competitive gaming nature and pride. The gaming generation places a high value on competence and wanting to be an expert in the first place (Beck, Wade 2006). Hence the research presentation serves to illustrate to their classmates and instructor how they became experts in a particular subject matter. Avoiding the traditional instructor lecture by having the students give presentations is an approach that students find appealing.

As reflected in the student grades shown in Figure 4, students prefer activities such as debates, roundtable discussions, and student presentations and they felt they learn more from the interactive formats (Sherman, 2005).



Student feedback by means of anonymous teaching questionnaires stated lecture material from text book Power point slides was boring, which is consistent with the expectations for the gaming generation. Another student commented that attendance should be required "because then the student would be more stimulated to learn."

6.0 OPPORTUNITIES FOR IMPROVEMENT

Class room attendance and class room participation were not mandatory and did not contribute to the overall grade. Many students felt that there was ample opportunity to obtain the required lecture material from the Blackboard™ web site and lacked enthusiasm for class attendance. There was a strong emphasis on textbook lecture material and presentation material to cover the fundamental knowledge areas.

Future class sections will mix lecture material with more interactive class discussion. Reading assignments will require class participation for analysis, discussion and presentation of issues. Students will be required to report on and discuss a contemporary IT management issue as reported in professional news journals. Class attendance and class participation will be included as part of the overall grading criteria. The use of case studies, analysis and class discussion will be

expanded to enhance critical thinking skills, and soft skills sets of communication. The benefits of case study analysis is to bring the business world into the classroom by providing real world problems, enabling students to develop problem solving skills, and professional knowledge (Lei, Mariga, Pobanz, 2003). Students will be provided with discussion questions for each of the case studies presented and will be graded on their participation in class discussion of the questions. It is hoped that by promptly posting grades on blackboard for class participation and discussion the students will be motivated and challenged to participate more.

Although the quality and content of the research reports generated by the undergraduate students was remarkably high quality in terms of content and topics, the research references were weak. College undergraduate students lack the skills to effectively utilize library resources to perform literature searches and evaluate the credibility of different information sources (Liu & Houdek 2006). There is a lack of scholarly literature search skills and many students used reference sites, such as Wikipedia, Google, or the URL from where they obtained the information. Future course offerings will include library instruction on how to perform literature searches, increase students awareness for peer reviewed texts and potential credibility issues, and improve the students judgment on the publication venue and citation information. Additionally the course will provide a reading list of suggested articles reference literature, and case studies as a starting point for the research activity. Grades for the research report will be reflecting the quality of the literature citations.

7. CONCLUSIONS

The digital gaming generation had made it clear that traditional teaching methods do not satisfy their learning needs. They refuse to be force fed a "canned education" such as Death by PowerPoint presentation lectures. Therefore, they require fundamental shifts in the traditional teaching approaches.

Our individual teaching experiences coupled with the review of literature made us realize that indeed there is a clear digital divide between the baby boomers and the gaming generation. This gap requires teachers to rethink how material should be presented in the classroom. The digital divide should cause teaching professionals to reconsider traditional pedagogical methodologies.

When educators clearly understand that 75% of students learn best when actively and visually engaged, then they will begin to implement the necessary changes to close this digital divide. These changes include teamwork on course projects for case study analysis - the alignment of theory with practice, discussions of current industry trend and events, collaboration with the instructor and other students, and online participation.

IT educators must create a classroom environment that includes a diverse number of learning styles, interactive exercises, and discussions to foster critical thinking, engagement, enthusiasm and learning. Educators need to develop new teaching methodologies and learn how to engage this new generation while providing the students with both the soft skill sets and technical knowledge required for the global competitive market. The use of online learning tools such as Blackboard™ for online testing and other learning features proved to be beneficial and effective.

8.0 REFERENCES

Beard D., Schwieger D., & Surendran K., (2007), *Incorporating Soft Skills into Accounting and MIS Curricula*, Proceedings from the SIGMIS-CPR 07 Conference, St. Louis, Missouri, ACM Publications, 179-185.

Beck J.C., & Wade M., (2006), *The Kids Are Alright - How the Gamer Generation Is Changing the Workplace*, Boston, Ma, Harvard Business School Press

Bruno, J. B. (2007), NYSE Euronext Opens Transatlantic Trading. *Associated Press* April 5, 2007, pg. D02.

- DeKanter N., (2005), Gaming Redefines Interactivity for Learning, *Tech Trends*, Vol. 49., No. 3, 26-31.
- Howard E. V, (2005), Promoting Communication and Inclusiveness in the IT Classroom, *Proceeding from the SIGITE 05 Conference*, Newark N.J., ACM Publications, 311-317
- Laware G. W. & Walters A. J., (2004) Real World Problems, Bringing Life to Course Content, *Proceedings from the SIGITE 04 Conference*, Salt Lake City Utah, ACM Publications, 6-12
- Lei C. & Houdek R., (2006), Teaching Computer Science Graduate Students Scholarly Literature Review Techniques, *Proceedings of the 36th ASEE/IEEE Frontiers in Education Conference*, San Diego, CA., M1H14 -19, ASEE/IEEE Publications.
- Lei K., Mariga J. R. & Pobanz B. R., (2003) From Theories to Actions: A Proposal for A New Course on Enterprise Information Systems Integration, *Proceedings from the CITC4 03 Conference*, Lafayette, Indiana, ACM Publications, 106-110
- McLester S., (2005), Game Plan, *Technology and Learning*, vol. 26, no 3, 18-20.
- Miertschin S. L. & Willis C. L., (2003), A Freshman Course in Emerging Information Technologies, *Proceeding from the CITC4 Conference*, Lafayette, Indiana, ACM Publications, 115-119
- O' Hara M., (2007) Strangers in a strange land: Knowing, learning and education for the global knowledge society, *Journal of Futures*.
- Rosenberg (2001), *E-Learning: Strategies for Delivering Knowledge in the Digital Age*, New York NY, McGraw Hill Companies
- Schadler T. Cohen S., & Brown, (2006), Gen X And Gen Y Can't Live Without Their PCs Which Devices Can't Consumers Live Without? *Forrester Research Inc.*, 1-7
- Sherman (2005), Earning Positive Evaluations from IT Students: Effective Techniques, *Proceeding from the SIGITE 05 Conference*, Newark N.J., ACM Publications, 255-259.
- Simpson (2005), What Teachers Need to Know about the Video Game Generation, *Tech Trends*, Vol. 49, No. 5, 17-22
- Wankat P. & Oreovicz F. (2005), Gaming the Curriculum, *American Society for Engineering Education, PRISM*, Vol. 15, No. 1, 49.