The Evaluation of the Utilization of Technology in Teaching at Florida University

Iwasan D. Kejawa
Miami-Dade College
Department of Computer Science
School of Business, Engineering & Technology
Miami, Florida 33167-3418 U S
Email: ikejawa [AT] mdc.edu

Abstract ---- **According to the previous survey conducted by Florida Atlantic University Student Academic Affairs department in 2001, it was indicated that faculty uses of teaching and learning technologies/electronic instruction media to teach and deliver their lectures at the college were lacking.**

With the current research study, investigations were thoroughly observed, and suggestions are provided on the improvement of faculty performance in the use of technologies at the institution to teach and convey knowledge to their students. In this report, the institutional personnel and its administration are made aware whether all existing technologies are being optimally used by faculty. This study also conveys and enumerates and recommends the performance enhancements of the use of technologies to the institution.

The survey performed earlier, found that there was deficiency in the use of technological learning tools such as electronic blackboards-computers, e-mails, audio-visual tools and projectors, etc. – instead faculty tends to rely on textbooks, oral presentations and past experiences with limited or without the use of technologies or computers.

The question addressed by this research is: Is faculty using all phases of technology to teach and convey instructions to students appropriately? This report reveals the result of the usage of technologies/electronic media in teaching and the level of use. It reveals whether faculty is using all the combinations of technological accorded to them, such as projectors, email, inter-net, videodiscs, teleconferencing, power point, television and movies, at any point in the delivery of lectures.

The result of the current study demarcates the result of the previous survey. It is found that nearly all the faculty are utilizing projectors, email, inter-net, videodiscs, teleconferencing, power point, television, electronic boards and movies in teaching and conveying instructions/lectures to their students. According to the result, about 95% of the faculty uses some forms of electronic media to teach and convey knowledge to their students.

Keywords—Technology, Instruction/Education, Computer, Teaching, University, College, Electronic Media

I. INTRODUCTION

Florida Atlantic University (FAU) was founded in 1963 by the state of Florida. It is growing tremendously, comprising five campuses: Boca Raton, Fort Lauderdale, Treasure Coast, Davie, and Jupiter. It is now also the most diverse university in Florida. Credits hours have increased by more than 11% over last year to the highest level in FAU history. Overall enrollment has continued to grow at an enormous rate – surpassing 35,000 students,15% increase in headcount over the previous year. The freshmen class is the largest in FAU history. The diversity of FAU students is steadily growing. African-Americans make up 18% of the freshman class of 2000/2001, up 20% over last academic year. Overall African-Americans comprise 8,160 of the student 48,000 total population. Total Hispanic enrollment is up 13%. Asian enrollment is also growing, accounting for 6% of the student population. Nevertheless, minorities now make up about one third of the FAU student body; International students are about 8% of the student population. Enrollment in distance learning credit courses has also increased an incredible 96%, from 2,900 in 1999 to 5,800 in 2002. Continuing education programs have 20,000 students and lifelong learners numbered about 23,000.

Nature of Problem

With last year survey of the former FAU students by the Department of Academic Affairs, it has been discovered that faculty are not using adequate technologies (Electronic media) to deliver lectures. According to the survey, the use of electronic technologies/electronic media by faculty in the delivery of instructions at the college is inadequate and inefficient as the survey portrayed. It was shown by the survey that 80% of the faculty does not use technology/electronic media in delivery instructions at the institution. The insufficient or inefficient usage of technology/electronic media as presented by he survey was creating a dilemma or confusion of whether
there is need for further faculty training and provision of other interventions or solutions to eliminate the gap or problem.

The lack of data and information regarding the use of technology/electronic media by faculty had not been thoroughly assessed by the university. Certainly, the university provides the faculty with a variety of technology resources and offers various training opportunities to broaden faculty abilities in using technology/electronic media to convey lectures or transfer knowledge to their audiences, but the extent of its use has not been adequately determined.

II. PURPOSE OF STUDY

The purpose of this research was to determine why all faculties at FAU do not use electronic media in the delivery of instruction. The purpose of this research also was to evaluate all faculties in the use of technologies/electronic media to deliver lectures at the University. Faculty is already using technology/electronic media to deliver lectures, but is the usage of technology optimal? The University may need to improve faculty performance and awareness in the use of technologies or electronic media to improve and increase students' means of acquiring knowledge, meeting ambitions and embellishing their performance significantly in academics, personal endeavors, and all society or community engagements.

Significance to the Institution

This study would benefit the university because it would determine if technology/electronic media is being applied sufficiently by faculty to the mode of their instructions.

Because electronic media make it easier to transfer and acquire data and information, the use of electronic media by faculty allow students to comprehend the instruction more easily. The study would present to the university reasons behind the lack of use of technological tools by the faculty and the way by which this can be improved.

Research Questions

To what extent is faculty using appropriate technology or electronic media to deliver instructions at FAU. How can the University help faculty facilitate better use of technological resources available to them in the delivery of instruction/lectures?

III. DEFINITIONS OF TERMS

For this research, the following terms need to be defined clearly.

Action Learning: This is a process whereby there is a formation of group of entities to solve a problem, and feedback is provided to each entity for his or her actions or performance.

Electronic Media/Technology: Any electronic visual or audio aids intended for the use in instructions.

Faculty development: This is the development of individuals through trainings and remunerations.

Faculty: All instructional incumbents or dignitaries in an education organizational setting.

Lectures: The modes or systems by which instructions or training can be conveyed to acquire knowledge and transfer knowledge.

Use: The utilization or application of a tangible or intangible object to attain a possible result

IV. REVIEW OF THE LITERATURE

Literature in the fields of faculty development, action learning methods and instructional technology provided guidance for improving instruction and developing proposal. Basic institutional literatures as well as higher education literatures were reviewed. Key words used in the literature search include education models, instructional technologies, and the use of technology in education.

Faculty Development

Faculty development and evaluation share a common characteristic; that is, they both have been subjected to varying interpretation in our colleges and universities (Smith, 2000). According to Smith (1999), faculty development activities included programs such as sabbatical leaves, faculty orientation sessions, travel to professional conferences, or similar events; the most active professional development programs of the past are designed to help professors upgrade and update knowledge of their specialties. An excellent research reports on faculty development concept and programs are a book by Jerry Gaff (1999). Gaff (1999) found three different but related approaches to improving instruction in higher education that he identified as "faculty development," "instructional development" and "organizational development."

To make a difficult job even more difficult, Howey and Zimpher (1999) stressed that professional development of teachers or faculty must be embedded and integrated deeply in their ongoing activities. We must develop an instructional capacity that simply does not exist in many places; the ways of doing things in schools and colleges must change so that faculty members can be enabled in a sustaining and pervasive manner.

Technology in Education

According to Ashby (1999), the institutions of society are not adapting themselves to the consequences of technological change. Ashby (1999) stressed that technological change increases, as the order of magnitude of events which makes the pressure of our present values become intolerable – the recent advances in technology are having unpredicted and alarming increased second-ordered effects.

The use of technology/electronic media may be beneficial to both students and faculty. The quality of education to students will be improved overall. Better ways of teaching result in good ways of learning, according to Ashby (1999). The use of projectors, Internet, tele-course, video, and coaching the inexperienced faculty will invigorate and improve our faculty performance, thereby improving the standard of education in our school as explained by Ashby (1999). In the world of today, technology play a vital role in education compared to yesterday. Chalk and blackboards have been replaced with marker pens screen, videos, and projectors. The use of technology will elevate the mode of teaching and eliminate fatigue that leads to monotonous job functions. Faculty would be able to have less time in preparing lesson notes and have more spare time to spend on research and other administration functions of teaching.

Knowledge of innovative tools in teaching would enable faculty to be better prepared for courses outside their specialization and will ease the burden of teaching overload. The encouragement of faculty to use technology to teach their courses allows faculty to enhance their skills and knowledge to perform in their subjects

and courses outside the field of their specialization according to Smith (2000). From personal experiences and theoretical observations of the use technology rather manpower at some institutions, the use of technology makes people capable mentally, physically, and emotionally of achieving their goals. Considering these benefits, it may make faculty resistant to fatigue, distraction, and embellish their performance.

Summary

It can be reiterated that the use of Electronic Media/Technology is surely the path to acquire and apply knowledge. But is it the path to perceive and manipulate things in the physical world? Indeed, these paths are part of what technology is, according to Salem (2000). The use of technology surely excites people who want to uncover principles that all intelligent information procedure must be exploited, not just those made of wet neural tissue. Consequently, there is neither an obsession with mimicking neither human intelligence nor prejudice against using methods that seem to involve human intelligence. Just as psychological knowledge about human information processing can help make computer intelligent, theories derived purely by using computers suggest possibilities about methods to educate people better, according to Winston (2000). To be said another way the methodology involved in making smart programs may transfer to making smart people.

V. EVALUATION METHODOLOGY

The methodology used in this study was the data collection method which consist of questionnaire and literature review. The questionnaire was the Likert survey questionnaire method. The researcher developed 18 questions on purposes or objectives of the research. The survey questions objectives of the use of technological tools in the delivery of lectures in and outside the classrooms were the focus of the questionnaire. The research subjects, in this case the faculty were selected randomly from the Faculty list obtained from the University personnel Department. The 18 questions were mailed to 50 instructors and lecturers by 3rd class mail, accompanied by participant solicitation letters. The questionnaire was completed by the faculty on time and returned to the researcher for analysis and evaluation. There were four categories of questionnaire which are included in the appendix E, and F, G, H.

The questions in appendix E indicated to the researcher and others how often faculty use technology in delivering lectures. Since the uses of technologies enhance performance and provide students with easy understanding of the subject, thus improving instructional effectiveness according to the reviews of literature, these questions were very important to the success of the evaluation.

A group of faculties at the FAU various colleges/departments were to be studied. Generality was very important because all students must take at least one technology course as part of the degree requirements. To see faculty practice what they teach or required of their students was very important.

Various texts of faculty development, Instructional and curriculum models, education models and Technology in higher education served as literature review. All the areas of the use of electronic media were explored in its entirety. The review of literature would propagate the similarities and differences of findings to justify the solutions for the research questions.

The Kirkpatrick's model, reaction measure, learning measure, behavior measure and result measure, for evaluation were appropriate measures for this research: Since the 1999 ASTD State of the Industry Report (Bassi and Van Buren, 1999) indicates that 81% of courses offered by leading-institutions are evaluated at reaction level of the Kirkpatrick's model. The questionnaire summary form used is shown in appendix D.

The evaluation results were based on the analysis of the survey result. The CIPP model to decision making and accountability as described in the Handbook in Research and Evaluation by Issac and Michael (1997) also were used as evaluation instrument. There was solution strategy, record of objectives and bases for chosen the objectives. There were also records of chosen strategy and design and reasons for their choices. In other to meet the criteria a questionnaire (Appendix C) was developed and presented to the committee members within the institution for evaluation. Implementation and the record of the actual process was also discussed and presented. The data from the survey was collected, tabulated and analyzed.

First, a review of literature was explored by using the terms: faculty development, Instructional and curriculum models, Technologies in education and uses of electronic media in higher education. Once sufficient reference material has been identified and abstract reviewed, libraries were visited, and relevant copies were made. The review was conducted to obtain as much information as possible, to review similar studies and their results pertaining to the foundation and uses of electronic media/technology in delivering lectures to establish foundation for the evaluation.

The assessments developed by the researcher were based on the Kirkpatrick reaction evaluation method and these were provided to the formative committee for their review, input and comments. Recommendations and comments from the formative committee were collected in writing, and were used to modify the survey questionnaires

Assumptions

It was assumed faculty is presently using electronic media/technology and that they were using it adequately and efficiently. It was also assumed that the use of technology and electronic media would provide innovative method in educating and improving services to both faculty, the students of FAU and the public. It was assumed by the administrators of the institution that enough technology amenities and training have been provided to the faculty. It was assumed the proper way to administer the survey was to send the questionnaire with letters to each faculty through the dean of each college because of the respect accorded to the dean by each faculty. It was assumed that

if an acceptable response rate is not accomplished, then the questionnaire would be redrafted, and the method of evaluation might rely only on observations of the classes in session.

Limitations

The study would be limited to the faculty at FAU. The use of technology in delivering lecture by faculty may require that more funds are provided by the budget office since it is very expensive to provide or automate and implement the use of technology by faculty. The provision of funds for implementation may be limited. Some faculty and students may also abuse the use of technology if there is lack of data security. Information or instruction delivery may be intercepted and gabbled through electronic media. Instructional technologies may have to be updated by faculty frequently. The survey might be limited to some of the problems that usually result from mailing survey, one of which is getting lost in transit. In other to prevent this problem, a second survey with a letter was sent to follow the first one just to make sure that each faculty did receive the package.

Expectations

It was expected that if all faculty were using electronic media/technologies in teaching or delivering instructions to their students, it would be beneficial to both the faculty and the students. Faculty workloads would be reduced, and students would also be able to comprehend the lessons easily as portrayed by the literature review.

Anticipated Benefits

The evaluation of the use electronic media/technology by faculty in teaching or delivering instructions to their students is very important to the institution because of the current technological trends in education. Based on the literature review the use of technology/electronic media would also promote effective teaching methods. The study would be of a great benefit to the institution because it would enlighten the administration if faculty is using electronic media/technology efficiently. It would give the institution an insight to the proficiency of the use of electronic apparatus/technologies in teaching or delivering lectures to students.

VI. RESULTS

The result of the data collection was very outstanding and firmly met the criteria of the survey. 50 faculty members of the university were surveyed, and 100% of the faculty responded to the survey. Also, five classes were observed to see if there was any use of technologies in teaching or conveying instructions to students. The observations also yield positive results; all five classes show that various technologies are used to deliver lectures/instructions.

The responses to this survey show that various kinds of technologies/electronic media are being used by the faculty. Referring to Table A below, 83% of the faculty surveyed are using technologies of some kind while 17% are not. This shows

Table A QUESTIONS	# of faculty with Most Frequently answers	# of faculty with Frequently answers	# of faculty with often answers	# of faculty with Sometimes Answers	Not At All Answer.	TOTAL (n)
Overhead Projector is technology I use to teach?	20	15	10	5	0	50
Power Point is the technology that I use to teach?	5	8	10	15	12	50
Movies are the technology that I use to teach?	10	11	15	12	2	50
Interactive video is the technology that I use to teach?	15	10	10	8	7	50
Internet is the technology that I use to teach?	10	15	10	5	10	50
Television is the mode of technology that I use to teach?	8	7	5	10	20	50
TOTAL	68	66	60	55	51	(n)= 300

that there is progressive usage of technologies at the university. Out of the 50 faculty members that responded to the survey, 50 have used projectors as a teaching aid in one or more classes. The use of projectors amounted to 100% of the faculty surveyed. The survey indicates that 80% of the faculty are using internet while 76% are using power point. 86% of the faculty preferred the use of interactive video over television

The use of television by faculty is 60% of the population surveyed. There is significant number of faculty that preferred projectors instead of movies and interactive video. This result inevitably calls for the use of these technologies in delivering lectures in classroom and outside the classrooms.

Table B QUESTIONS	# OF Faculty with Strongly Agreed answer	# of Faculty with Agreed answer	# OF faculty with Neutral answer	# OF faculty with Disagreed Answer	# OF faculty with Strongly Disagreed answer
Power Point is the technology that I would like to use better in the classroom?	10	15	8	10	7
Interactive video is the teaching technology that I would like to use better in the classroom?	9	10	7	14	10
Movies are the teaching technology that I would like to use better in the classroom?	5	8	10	20	7
Overhead Projector is the teaching technology that I would like to use better in the classroom?	4	10	8	20	8
Internet is the teaching technology that that I would like use better in the classroom?	25	10	5	5	5

Table B above indicates the type of technology that faculty would like to use better in teaching/delivery instructions or lectures at the university. 50% of faculty surveyed agreed that power point is the technology that they would like to use better while 34% disagreed. 16% of the faculty members do not agreed or disagreed. Relating to this table, 70% of the surveyed faculty members also responded that internet is the technology that they would like to use better while 20% disagreed and 10% neither agreed nor disagreed. The survey shows that there are a significant number of faculty members that would like to use internet and power point better in teaching or delivery instructions/lectures at the university compared to the use of interactive video, movies and overhead projectors.

Table C Questions	Very High	High	Moderate	Low	Very low
How is the present level of use you make of the Overhead Projector?	20	10	15	5	0
How is the present level of use you make of the interactive video?	15	15	10	5	5
How is the present level of use you make of the Movie technology?	10	15	15	5	5
How is the present level of use you make of Power Point technology?	20	15	10	5	0

On the table C above, the magnitude of the present level of the use of all technologies is shown. 40% of the faculty surveyed indicated that their present level of use of overhead projector is very high while 20% reported high present level of use. 10% indicated lower present level of overhead projector usage compared to 30% of the faculty moderately usage of overhead projector at the present level.

The surveyed also shown that there is a very high present level of power point usage. Out of the 50-faculty surveyed, 20 reported that the present level of use they make of power point technology is very high compared to 5 of the faculty which reported that the present level of use they make of power point is low. According to the surveyed, interactive video is also highly use by the faculty to convey instructions or deliver lectures at the present level, so is also movie technology.

Table D Questions	# of Yes	# of No
Is the institution providing adequate software and hardware for the use of technology?	40	10
Is the institution providing enough training and coaching as a group in the use of electronic media/technologies?	45	5
Do you want the institution to provide additional funds to the training of personnel and faculty?	47	3
Have you ever use e-mail to communicate with your students before and after classes?	50	0

In response to the question of using e-mail table D as shown above whether faculty communicate with students before and after classes, all members of the faculty surveyed replied that they have communicated with their students through e-mail. 100% of the faculty surveyed had used e-mail to communicate with them students. This positive response justified that the use of this kind of technology is adequate.

With the question of whether FAU is providing adequate software and hardware for the use of technology, 80% of the faculty surveyed favored adequate provision of software and hardware by the university while 20% of the faculty was dissatisfied.

According to the result of the survey, 90% of the faculty responded that the institution is providing enough training and coaching as a group in the use of electronic media and technologies while 10% of the faculty declined that this is true.

The overall results disapproved the research question which states that: Is faculty using adequate electronic media/technologies in teaching or conveying instructions to their students?

Referring to the question of whether the university is providing adequate software and hardware support to the faculty:

The response shown in the table D above, shows 80% of the faculty indicated that the establishment is providing adequate software and hardware for the use of technologies; and 20% expressed dissatisfaction in service and called for a need for improvement.

To solve the performance gap which indicated that there was a need for faculty performance improvement in the use of certain technologies in the establishment to convey instruction to their students, the action learning HRD (Human Resources Development) intervention strategy was used to close or eliminate and improve the performance gap. The intervention, action learning plan was used because it is the most appropriate intervention to close the performance gap, because performance already existed and what is needed is to improve performance to a certain level. This is to say performance has been established, but the quality of performance needed to be improved.

The results from the survey were discussed with formative and summative committees, and the learning experience was analyzed. All the committees eminently supported the ideas that more training and coaching could improve the ways technologies are used in conveying instructions by the faculty.

The questions posed and addressed by the researcher and the committee were the following:

1) Did the research survey achieve the intended goals of the study?
2) Did we have the information needed?
3) Are there any ideas about how to close or improve the problem/gap?

In response to these questions, the committees agreed that the survey did achieve its intended goals. The committees also agreed that we did have the information needed and that there are some ideas on how to close or improve the performance gap.

According to the summative committee validation, the result of the survey and observations met the purpose of the research question, which was: Is faculty using enough or adequate technologies in conveying instruction/lecture? Since we only have limited time to implement the intervention, the evaluation method that was used to assess the effectiveness of the intervention was the Kirkpatrick model of evaluation levels which were the Reaction, Learning, Behavior and Results measures and the 360 degrees method of evaluation. The evaluation summary was prepared by the researcher and include the report.

The written participant questionnaire as prepared in Appendix J would be sent out to surveyed participants periodically; results would be collected and analyzed. The

results of the questionnaires would emphasize the value gained by the performance improvement intervention – the action learning intervention. The interventions would be implemented so that the intervention may achieve the goals it was established to accomplish.

VII. CONCLUSION

The ultimate promise of any new technology is not easily projected. It does seem certain that the linking of the computer with its capacity for rapid and versatile information processing, to laser-operated videodisc player provides opportunities limited only by our imagination and persistence.

The interactive use of videodisc with computer link permits presentations of both moving visuals and still frames. The use of such technology with nearly instantaneous random access to any of thousands of pieces of information is unique and promising for many varieties of training activities. Teaching episodes can be viewed, analyzed, and re-viewed for focused discussion or manipulated with both sound and visuals.

While costs have been prohibitive in the past, the flexibility, speed and versatility of the computer link to videodisc or video cassette player now offer possibilities of simulated training of immensely important kind. It is now more practical and economical to use video simulations of problems and simulations linking microcomputers to provide for rapid response and feedback. We must take the following types of improvements into considerations when evaluating and

considering faculty performance improvement in the use teaching technology:

1) Improving instructional goals and objectives.
2) Improving instructional resources provided.
3) Improving the tools for instruction
4) Improving the working conditions within which teaching take place.
5) And improving faculty performance.

Implications

The use of technologies/electronic media in teaching may create an enormous problem and may also be costly. The

information age is very vulnerable, and data may be lost through transmission and data may also be corrupted. Faculty may have to spend time protect their information and there may be an abundant information available to both students and faculty. Student may also abuse the communication privileges.

Recommendations

The establishment should support the increasing prevalence of IT-mediated instruction through both central facilities and specialized sites in individual colleges. Technology for classroom, whether the most advanced or at lower level such as overhead projectors, should be adequately configured and maintained with close coordination among all parties involved the assistance of the use of such technology should be available as needed.

All components of the university should recognize that the rapid growth of reliance in technology requires that an increasing portion of the university resources be dedicated to it. To assure that technology decisions recognize technology cost, budgeting mechanism should be developed that allocate resources to the unit most directly responsible for the use of technology. On-site technical support should provide expertise appropriate to the individual needs of the faculty. All faculty, staff and students should have access to

information technology resources appropriate to their needs and responsibilities. This access should be provided with a reliable network. The university technology department should be consistent, coherent, current and easily accessible to all faculty, staff and students alike.

This research has shown that the inadequate technology usage problem or gap can be closed by various interventions. One of the interventions to close or solve the performance gap or HRD problem in any organization is the implementation of the action learning intervention and all possible Human resources development methods. It was discovered as result of the research that human resource development (HRD) is not to be confused with

human resource management (HRM) or organizational behavior. They both differ in that HRD deals with the development (training and sabbatical) of employees while HRM deals with providing employees with resources (performance, productivities and benefits). Performance can be enhanced through rigorous training, coaching, workshops, and by using the action learning method. It is also to be understood that performance is derived actions learned and that it can be motivated by rewards, compensations and employee's recognition.

The new questions that arise in my mind are what impact will or does performance have over organizational behavior? And

how can this be ameliorated? It will be of benefit if both the president and the director of human resources at FAU are all concerned about developing human resources at the school with the help from other department heads.

VIII. REFERENCES/BIBLIOGRAPHIES

- Ashby, E. (1999). *Adapting university to technology*. London, UK: Jossey-Bass Limited.
- Bassi, L. J., and Vann Buren, M. E (1999). *The 1999 ASTD State of the Industry Report, a supplement to Training and Development Magazine, 53(1), 1-27.*
- Howes, R.J. (2000). *Effective learning methodology*. London, UK: Jossey-Bass Limited.
- Howey, K. R and Zimpher, N., L. (1999). *Informing faculty Development for Teacher Education*. New Jersey: Ablex Publishing Company.
- Issac, S. and Michael, W. B. (1997). *Handbook in research an evaluation for education and behavioral sciences.* San Diego, CA: Edits.
- Langdon, G. Whiteside, S and Mckenna, M. (1999). *Intervention resource guide*. San Francisco, CA: Jossey-Bass/Pfeiffer.
- Marquartdt, M. (2001) *Action Learning*. Alexandria, VA: American Society for Training and Development Press.
- Salem, Abdel-Badeeh M. (2000). *Potential usage of technology in education*. London, UK: Cambridge Press.
- Smith, A., B. (2000). *Faculty Development and Evaluation in Higher Education*. San Francisco, CA: Jossey-Bass
- Weinstein, K. (2001). *Action learning*: *A journey in discovery* and *Development*. New York, NY: Harper-Collins Press.
- Winston, P. H. (2001). *Intelligence technologies*. Reading, MA: Addison-Wesley Publishing Company.
- Wilson, A. L (2000). *Adults and continue education*. San Francisco, CA: Jossey-Bass.