ASSESSMENT OF COMPUTER BASED EVALUATION AS USED BY VOCATIONAL TECHNICAL INSTRUCTORS

By

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A Research Paper

**Submitted in Partial Fulfillment of the
Requirements for the
Master of Science Degree
With a Major in**

Vocational Education

Approved: 2 Semester Credits

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ABSTRACT

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Assessment of Computer Based Evaluation as Used By Vocational Technical Instructors
(Title)

M.S. Vocational Education	Michael J. Galloy Ph.D.	5/01	30
(Graduate Major)	(Research Advisor)	(Month/Year)	(No. Pages)

American Psychological Association (APA) Publication Manual
(Name of Style Manual Used in this Study)

This paper investigated the positive and negative characteristics that are associated with the development and the implementation of a computer based evaluation system (CBE) in post-secondary education. The goal of the CBE system is to enhance the learning capability of the instructors and their students by this incorporation of technology in the educational system. The CBE system allows instructors to become effective and efficient in their instructional skills by allowing instructors to process scores and data with increased efficiency, which allows them to develop and revise course material for maximum effectiveness. However, questions of computer anxiety, validity, and reliability of such tests have raised concerns directed at the CBE system, which may have a considerable impact of the implementation of a CBE system in the post-secondary schools.

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CHAPTER I

Introduction

"Computer technology has the capacity to affect the efficiency and productivity of education" (Ferrer, 1998, p. 1). Now, more than ever before, educators have an opportunity to use computer technology for their instruction and allowing them to best cope with the extremely high expectations that are placed upon them by themselves, as well as students, parents, and by industry. In order to accomplish these expectations instructors need to practice impeccable time management skills. The amounts of time instructors receive from their institutions for preparation of coarse work, materials, and delivery of class content is often inadequate. To negate these restrictions placed upon educators they have turned to technology in allowing them to become more self efficient. As a result, educators are now able to better prepare with minimal amount of time and energy. Inadequate preparation can especially be observed when delivering essential information to students. Whether instructors are delivering a lecture, or conducting a demonstration or activity, the need for a systematic and logical approach is necessary in order to achieve adequate student comprehension of the materials in the allowed amount of time.

Perhaps, one of the most effective uses of computer technology for educators has been demonstrated by its application in student assessment and evaluation. Student assessment is defined as, “the use of various written and oral measures and tests to determine the progress of students toward reaching the program objectives" (Sockey; Wilde, 1995, p. 5). The term evaluation is defined as, “the summarization and presentation of these results for the purpose of determining the overall effectiveness of the program, the worth of the program, in order to evaluate the program" (Sockey; Wilde, 1995, p. 5). For the evaluation process, computer based evaluation (CBE) can be

implemented rather than the traditional paper/pencil tests. This can be very beneficial to educators in the efficiency of reading, developing, and scoring traditional paper/pencil tests as compared to CBE tests. "Student assessment is an educational process that is expensive in terms of staff and student time when traditional written examinations are used" (Lloyd, 1996, p. 2). Software designs now allow instructors to reduce as much as 50% of their evaluation time by using CBE (Zakrzewski; Bull, 1998, p. 7). This extraordinary amount of time that may allow instructors to be considerably more productive in their time spent with preparation outside of class and allowing them to demonstrate efficient use of class time. The need for instructors to continually update and evaluate their own materials also requires a considerable amount of effort and time. CBE allows instructors to manipulate and quickly adjust problems that may be occurring with their curricula to promote a continuous learning environment.

The use of CBE has shown a tremendous amount of success when properly used by instructors. The students who are using CBE may also view its benefits. Students are experiencing a new era of technology allowing them opportunities and freedoms never before available in the educational system. Options have now allowed students the ability to complete coarse testing when their schedule permits. This option is especially convenient for the increasing numbers of non-traditional students in post secondary education, and for the traditional students working part or full time. CBE also addresses the subject of immediate self-gratification. It performs this task by allowing students to view their test results immediately after completion of the assessment instrument. This ability can rarely be applied with traditional paper/pencil testing. Allowing students to receive immediate gratification enables them to view their comprehension of the course materials and what the expectations of the program requirements are.

Instructors greatly benefit from CBE tests by allowing them to evaluate varying patterns and trends observed by the students scores and quickly determine any areas of concerns that may need to be addressed and corrected. CBE also allows instructors the convenience to randomize their testing instruments with a minimal amount of effort. In having this option instructors can reduce the amount of cheating enabling an accurate evaluation to the students as well as their instructor.

A review of literature shows that a successfully implemented CBE program can be beneficial to instructors and students when properly implemented into the educational system. It also shows the use of CBE is a reliable and valid form of evaluation when measuring program objectives as well as student performance objectives. Therefore, the CBE system should be implemented into the Fox Valley Technical College (FVTC) Culinary Arts/Hospitality Program.

Statement of the Problem

The vast responsibilities placed upon instructors at FVTC have forced them to use alternative evaluation devices in their course development. The inadequate amount of scheduled time for proficient student evaluation is insufficient. CBE is an effective device that can help faculty maximize use of their limited time. Currently, FVTC faculty in the Culinary Arts/Hospitality Program have little working knowledge of the efficiency and effectiveness offered by CBE.

Purpose of the Study

The purpose of this study described how instructors at FVTC increased their efficiency and productivity of student evaluation in the Culinary Arts/Hospitality Program by implementing a CBE program into their educational system as opposed to their current traditional paper/pencil evaluation.

Research Objectives

This study focused on the following objectives:

1. To determine the guidelines for the successful implementation of a computer based evaluation system
2. To determine the benefits of computer based evaluation vs. traditional paper pencil testing as viewed by instructors.
3. To determine the causes of instructor anxiety of computer based evaluation.
4. To determine the reliability and validity of computer based evaluation vs. pencil paper testing.

Limitations of the study

The scope of this study is limited to six Fox Valley Technical College instructors in the Culinary/Hospitality Program. Results of this study may not be generalized to all culinary/hospitality programs. Data was gathered through an interview process in which the instructors were asked to respond to interview questions to the best of their personal knowledge.

Chapter II

Review of Literature

Technology is influencing the educational system by the means of CBE. The application of CBE can have tremendous affects on instructors as well as students. This chapter will defines what CBE is, how CBE is applied, what is required for the successful implementation of CBE, why CBE is used, and what positive and negative aspects of CBE have been observed.

"Although the actual process of evaluation has a long tradition behind it, going back to the historic origins of psychometrics and experimental pedagogy, in the last three decades it has followed a course of marked, rapid expansion, with significant changes occurring in the way its conceived, in the methods it used, and in the way it is organized institutionally" (Ferrer, 1998, p. 2).

Zadviliet and Farragher, (1997) discusses several trends in educational technology that are contributing to the increasing focus on computers:

1. A gradual shift toward a more student centered approach in education and a more individual approach to learning in all its forms (Organization for Economic Cooperation and Development, 1987).
2. An increased appreciation for the motor skills and attitude of students has led to an increased focus on this type of learning (Province of British Columbia, 1990).
3. The almost explosive increase in the use of computers within our larger society has also increased the need to integrate computers into our educational institutions (p. 2).

In the new decade, the influence of computers and technology on the educational system is emerging as an efficient tool for delivering instructional content, and is drastically expanding in the area of student assessment and evaluation.

Implementation of Computer Based Evaluation Systems

As defined in the introduction, assessment is the actual measurement tool used to determine student's progress, while evaluation determines the overall effectiveness of the program. For convenience, there are an assorted variety of companies with CBE systems such as: WebTester Inc., The Examiner, Hyper Card, and Questionare have software packages available. According to Zakrzewski and Steven (2000) their study found the following:

> A CBE system is not just a piece of software that allows you to create and present objective tests. It is a complete system in which management, academic staff, support staff, and students are working together to achieve the system's aims and objectives. It requires human resources, physical resources, finance and quality documentation to succeed. A formal evaluation of the system must take place at each stage of development at the end of the academic year. Students and staff examination and recommendations are essential in the following areas: suitability of the assessment method, the comparative evaluation of CBE achievement against traditional assessment format, review of the effectiveness of staff training support systems, evaluation of the CBE administration, recommendations for improvement of the review of documentation, sampling of CBE specifications and examinations and discussions with relevant staff, and cost and benefits are areas that need to be accounted for. Despite the vast network of evaluation that must take place, when properly applied the system of evaluation will allow an accurate interpretation of the data collected (p. 2).

Implementation of Computer Based Evaluation vs. Paper/Pencil Evaluation

With the guidelines established for the successful implementation of a CBE program indicated, the question of how is CBE going to aid instructors in educating students arises. Research showed that time is the most beneficial aspect achieved by the use of computer based evaluation (Lloyd; Martin, 1996, p. 7). The consequences of increasing student numbers with a decreasing unit of resources have forced instructors to develop CBE systems. To begin the process, instructors must first develop objective tests such as multiple-choice questions. The development of the objective questions is a critical phase that requires a considerable amount of initial time invested. Generally, current assessment instruments can be used as a guide in the development of objective tests, but the potential of having to develop a substantial amount of objective questions does exist. Instructors have distributed this workload among colleagues and themselves in order to observe various objective writing styles, and to ease the work required by themselves. Once the instrument has been established, CBE holds three distinct advantages for educators according to Zadviliet and Farragher (1997)

1. Randomization: Allows instructors to give different but equivalent tests by random selections of test items related by specific learning outcomes.
2. Scrambling: Enables instructors to quickly scramble the order of the items that are being assessed with minimal amount of effort.
3. Editing and Analysis: The capability to develop and continuous monitor and update course objectives and criteria when necessary with minimal effort (p. 4).

After the development of the initial instrument, considerably less time will be needed to effectively evaluate the level at which students are performing. Preliminary analysis of a questionnaire of post secondary educators indicated there is an average savings in

academic staff time of 50% for the first time CBE, and a further savings of 50% was achieved for subsequent updates (Zakrzewski; Bull, 1998 p. 7). Evidence can be viewed by the immediate computation of student assessment scores that are automatically marked, graded, and logged into the instructors database. The computer also provides detailed statistics and analysis on assessment scores either by individual results or an overall student performance. In addition, evaluation periods such as midterm, and final grading data will be calculated instantly by the computer based system. This eliminates a considerable amount of hands-on-time in the evaluation of traditional paper/pencil testing allowing instructors to demonstrate additional productivity in areas that were never available prior to CBE.

Despite the enthusiasm and the advantages that have been determined of CBE, research has also shown many barriers to the use of computer technology in education. These barriers include the lack of training and support, instructor self-efficacy, and computer anxiety. In a research study conducted in Dade County Florida, showed that 85% of the instructors' indicated they participated at least once in a computer related training program or class (Hao Yang; Mohamed; Bayerbach, 1999, p. 4). However, only 28% indicated they had a high level of computer skill and knowledge; 30% indicated they had little or no skill or knowledge (Hao Yang; Mohamed; Bayerbach, 1999, p. 4). Failure to properly educate instructors limits the extent in which CBE can be applied.

Instructor Anxiety and Computer Based Evaluation Systems

"Historically organizations have over looked the impact of employee confidence or self-efficacy in performance as a component in achieving organizational success" (Decker, 2000, p. 1). The increasing demands of computer technology have impacted many instructors morale and confidence to perform at the high level of expectations set for them. Research concluded that when given adequate and proper training that

according to the results and utilizing a 2 1/2 year time span, time distance did not impact computer self-efficacy in specific technologies (Decker, C. A. 2000, p. 1). Another barrier that has developed because the increased use of computer technology is "computer anxiety". Weinberg (1985) defined computer anxiety as a widespread phenomenon involving a negative emotional response to interaction with automated data or information-processing systems (Laguna, Babcock, 2000, p. 2). "The construct of computer anxiety involves a negative or stressful response to computers" (Laguna; Babcock, 2000, p. 2). Factors that may contribute to computer anxiety are age, gender, and prior computer experience. To negate the affects of computer anxiety among educators, the following methods may be effective in reducing computer anxiety. These methods include: increasing computer based training, enhancing computer competence, increasing computer confidence, and improving computer perceptions (Hao Yang; Mohamed; Bayerbach, 1999, p. 8). These methods require a strong commitment of educators, and administration for the successful elimination of computer anxiety among educators.

Reliability and Validity of Evaluation Devices

The use of CBE in theory may assist the efficiency and productivity of educators while increasing the accessibility to students, but are the assessment instruments used a reliable and valid form of evaluation? A study conducted by Bell (1980) and Kniveton (1996) concluded that well constructed objective tests can be as informative and reliable as traditional essay assessments, "if not more so" (p. 254). An experimental study between traditional paper/pencil tests and CBE, results showed that CBE techniques can be valid and also by their nature ensure reliability (Lloyd; Martin, 1996, p. 6).

An important issue that must be addressed is the affect of prior computer experience of students and its relevance to students test scores. A study conducted by

Lee (1986) among a group of undergraduate students showed that past computer experience significantly affected performance on a computerized assessment (p. 727). Therefore, CBE may discriminate against those who have not had prior experience of this kind of testing. This may give administrators the need to take account of candidates previous experience. Other factors that may influence this outcome are students knowing on what they will be tested on, and quality of academic support by instructors (Zakrzewski; Bull, 1998, p. 7). Continuous evaluation and student performance must be monitored to ensure the CBE system is effective. Lloyd, D and Martin, J. G. (1996) conducted a study on 120 post secondary students comparing traditional paper/pencil vs. CBE tests. A follow up study revealed that no comments were reported by students with any difficulty in the operation of the software that would indicate a lack of understanding. All software tests were completed in a satisfactory manner and returned without problems. The results showed the average performance of the groups of students was unaffected by the method of testing while student approval of the CBE was very positive. In fact, a larger proportion of students who undertook the test on the computer, indicated that they like to use the computer (Lloyd, D; Martin, J. G., 1996, p. 5).

CHAPTER III

Methods and Procedures

Introduction

The purpose of this study described how instructors at Fox Valley Technical College (FVTC) increased their efficiency and productivity of student evaluation in the Culinary Arts/Hospitality Program by implementing a CBE program into their educational system as opposed to their current traditional paper/pencil evaluation.

Research Design

The research design is qualitative and ethnographic in that it involves a limited population at a single technical college. The qualitative data, gathered through interviews was compared against data assimilated from the review of literature. Documentation of the research data was evaluated for discrepancies and commonalities in order to accomplish research objectives.

Population

FVTC Culinary/Hospitality Department had been selected for this study. All interviewee's were male. The following graph indicates a range of 8 to 17 years of prior professional experience, and a range of 5 to 27 years of teaching experience. FVTC is one of the largest colleges in Wisconsin and has a well-respected program. The program has 210 full-time enrolled students in addition to 24 students enrolled in apprenticeship/certificate courses offered. Instructors in these programs use CBE for approximately one third of the courses offered. Traditional paper/pencil evaluation is the primary source of student evaluation. Instructors are also responsible for the operation of the school cafeteria that is student operated.

Instrumentation

For inquiry, individual interviews were conducted. The interview process occurred with six current instructors in the culinary/hospitality program in a structured format. Each instructor was asked the identical 22 questions in identical order. Follow up questions were asked to ensure proper interpretation of subject matter was precise and accurate. The 22 questions used have been developed from examples as viewed in prior research studies, reviewed by Dr. Michael J. Galloy, Program Director of the Vocational Technical Adult Education Program at The University of Wisconsin Stout, and Jeffery Egel, Department Chair of Culinary Arts/ Hospitality at Fox Valley Technical College. A numerical form of evaluation was used for gathering the data frequency in which percentages of the data are displayed.

Procedures

The interviews with the six instructors occurred during March of 2001. Interview questions were mailed ten days in advance to allow instructors adequate time to prepare responses. Liabilities and consent forms were explained prior to interview commencement. No time limitations were enforced, but an average of 45 minutes was necessary for each interview.

Data Analysis

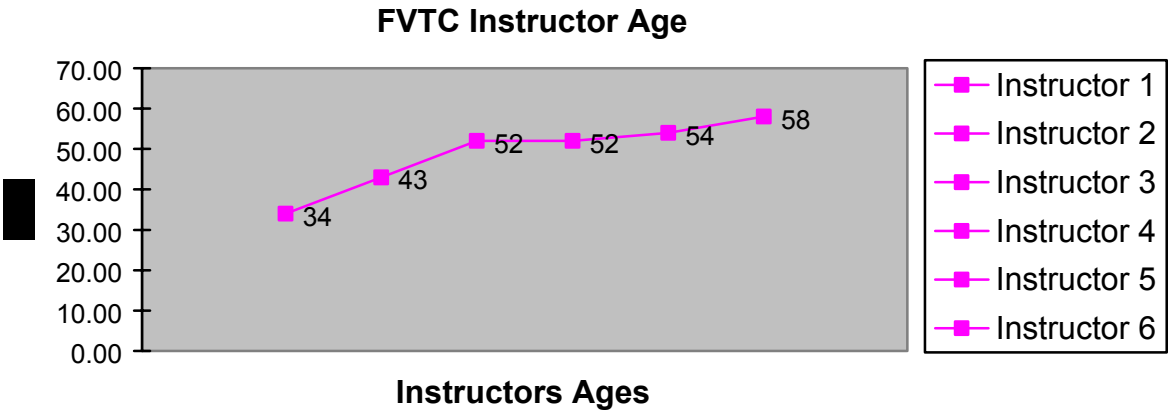
Data collected was documented by interviewer notation. The data exhibits the amount of variability from the data received according to the individually devised categories determined by the interview questions. Data collected from the interviews was cross-referenced with the data obtained from prior research studies to demonstrate any examples of variance, and correlation.

Chapter IV

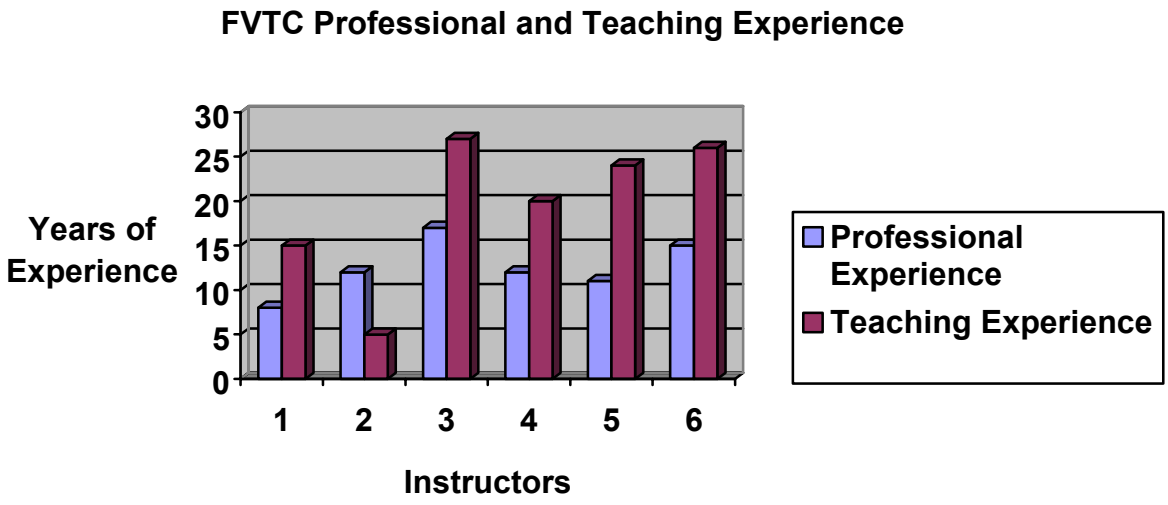
Discussion and Results

Introduction

The purpose of this study described how instructors at Fox Valley Technical College (FVTC) increased their efficiency and productivity of student evaluation in the Culinary Arts/Hospitality Program by implementing a CBE program into their educational system as opposed to their current traditional paper/pencil evaluation. The following graph displays the median age of the instructors, which is 52, also corresponded with previous research studies.



All interviewee's were male. The following graph indicates a range of 8 to 17 years of prior professional experience, and a range of 5 to 27 years of teaching experience.



Computer Based Evaluation Guidelines

For this study a personal interview questionnaire was chosen to document research results. Twenty-two identical questions were asked in identical order to six FVTC culinary/hospitality instructors. Results were documented for each question by interviewer notation.

Four of the six instructors interviewed elected to use CBE. The instructors were asked what was required of the institution and themselves for the successful implementation of a CBE system. Consensus included:

1. Effective communication between faculty, administration, and students
2. Continuous instructor maintenance of evaluation instruments
3. Adequate funding for implementation of the program

Overall, instructors felt FVTC met these criteria with their existing CBE system except for an outdated CBE program caused complications with the current CBE system. Instructors were asked if the institution provided any form of developmental training for CBE. Results showed that 100% of the instructors responded that curriculum

development courses along with various CBE training sessions are offered on a regular basis each semester. However, no instructors attended the offered courses on a regular basis. Time and instructor confidence in their level of knowledge deterred their participation in the offered courses.

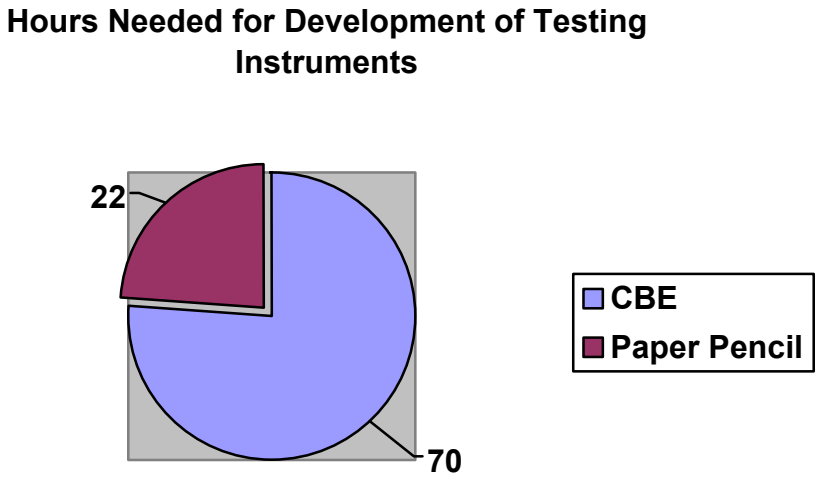
Benefits of Computer Based Evaluation Versus Paper/Pencil Testing

Instructors reported with a 100% agreement that CBE is a tool that can simplify the amount of instructor's course work. The most significant characteristic of the CBE system is the ability to reduce the amount of time instructors spend grading student test results. Instructors currently using the CBE system observed an average of 80% to 90% reduction in total amount of hours spent on the evaluation of student test results. Along with the significant decrease in spent time, instructors also found the CBE system has eliminated the human error factor, thus increasing accuracy when evaluating student results. The accuracy of test results may have also improved by the reduction of student cheating. When surveyed, 33% of the instructors felt the use of CBE may reduce the amount of student cheating and eliminate false interpretations of student comprehension of the designed course material.

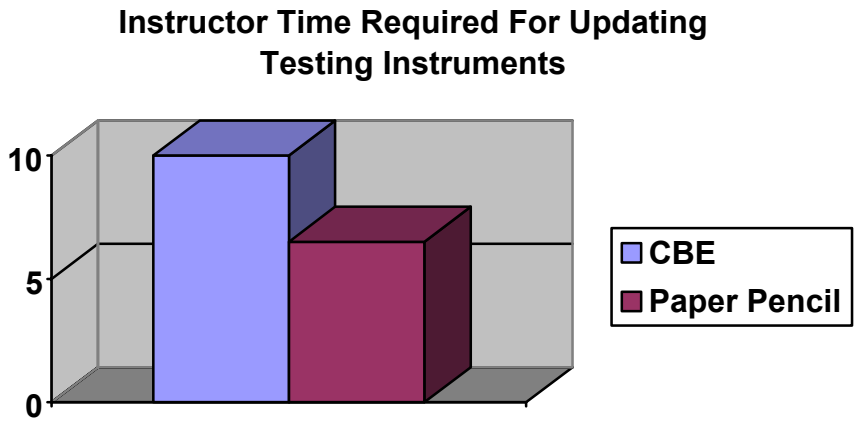
In comparison to CBE evaluation, many benefits have been observed with the use of paper/pencil evaluation. The most noticeable characteristic indicated was the ability to construct student evaluation instruments in a subjective form. With the capability to develop subjective questions, 100% of the instructors felt they were better able to evaluate student comprehension of course material as compared to CBE objective tests. Factors that may influence these results are the reading capabilities and interpretation of instrument questions by various students, and a lack of participation and communication between student and instructor. Subjective tests have also allowed instructors to evaluate students' written communication abilities and view students' thought processes when

generating answers to questions. By viewing such processes instructors felt they had a more precise understanding of what content areas needed to be further addressed and which did not.

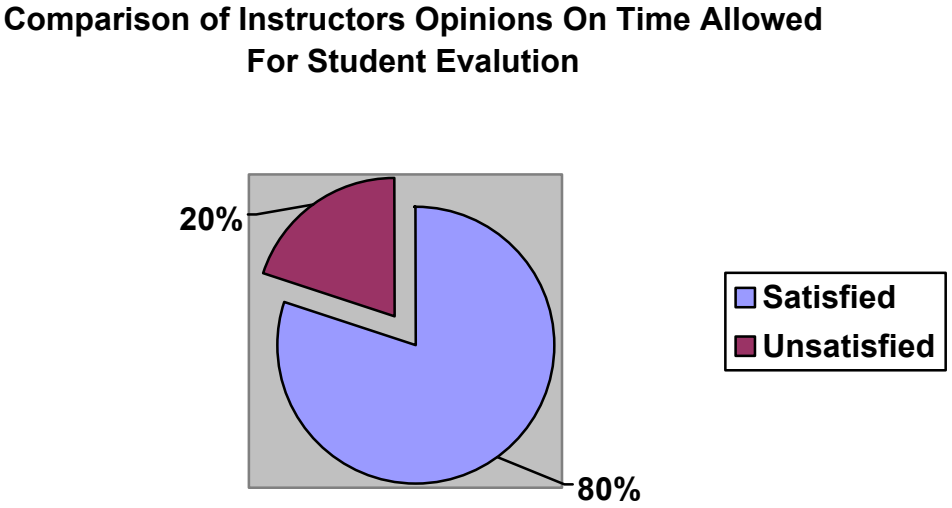
The development and continuous updating of CBE and paper/pencil evaluation tests are considerably different. The following chart illustrates instructors reported an estimated 70 hours was needed for the initial development of the CBE tests as compared to 22 hours needed for the paper/pencil tests.



The following chart illustrates the average amount of time spent updating testing instruments was estimated at 10 hours for CBE and 6.5 hours for paper/pencil tests per semester.

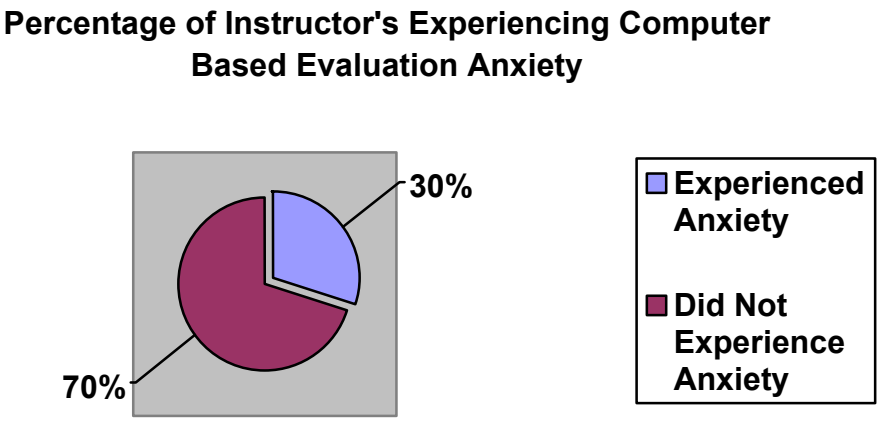


Instructors also estimated an average of only 3 hours per week was necessary for student test evaluation. The following graph indicates when instructors were asked if they had an adequate amount of scheduled student evaluation time, 80 % felt they had the necessary amount of time to accurately evaluate the students' performance.



Instructor Anxiety

In order to successfully implement a CBE system, instructors need to have a complete understanding of the many capabilities and limitations of their system. At FVTC, their CBE system is installed on their school's mainframe computer. Instructors are required to submit course material and testing instruments to the computer programmer where the documented material is entered into the mainframe for student access. Revisions to the CBE material are also achieved in the same fashion. The following chart illustrates instructor anxiety of this system was experience by 30% of the instructors.

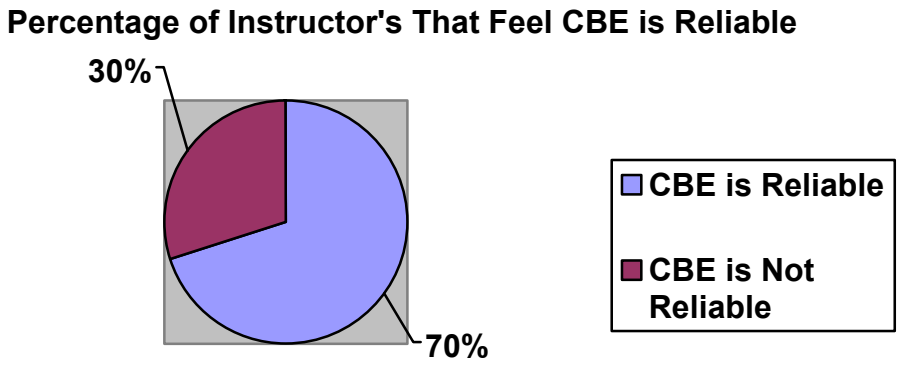


Attributing factors for this anxiety were a lack of accurate communication between instructor and programmer, and the lack of general computer skills. It was also documented that 50% of the instructors using the CBE system experienced some small degree of anxiety when performing such computer functions as word processing and Internet research devices. To cope with this anxiety experienced, instructors have benefited from the Computer Assistance Department at FVTC for questions and references in trouble shooting situations, and the strengthening of their own computer skills by the process of trial and error. Instructor anxiety while using the CBE system

overall was very minimal and was characterized as not having a significant impact on their ability to operate the system. However, 75% of the instructors had at one time felt a higher level of anxiety during the development of the objective tests. Inadequate objective test writing and development was expressed by the instructors as a considerable problem during the initial designing of the CBE evaluation instrument.

Computer Based Evaluation Reliability and Validity

The importance of a CBE system was verified in that 50% of the instructors interviewed felt that CBE is a necessary educational device that allows instructors to effectively practice time management and allows them to become more effective as educators. Yet, is this device a reliable and valid form of student evaluation? The following graph illustrates that 70% of the instructors indicated the use of a CBE system is a reliable form of evaluation.



70% of instructors also indicated CBE is a valid form of evaluation. The 30% of instructors who questioned the validity, indicated that temporary inoperable computer systems and tests improperly designed for coarse material affected reliability. Other factors included improper development of evaluation questions, and the inability to

measure student comprehension of the material. This has been associated with the large amount of hands-on procedures that cannot be properly evaluated through computer testing.

With the implementation of a CBE system, have students adapted to its use as an evaluation device? Instructors estimated that 70% of their students have accepted the CBE system with little or no difficulty. Instructors also estimated that test scores had increased 25% from the use of the CBE system as compared to paper/pencil evaluation. Attributing factors for this interpretation are increased computer literacy among younger adults, stimulation from the CBE technology, and the accessibility for students to take the examinations at their own convenient time. These factors may contribute in many different orders and various combinations.

Summary of Discussion and Results

The application of a CBE system may be very beneficial to instructors and students when properly implemented. The need for proper communication among colleagues and students along with effective evaluation instruments and the computer technology is imperative to the successful implementation of a CBE system. Benefits from the system can be observed by the decrease of instructor's time needed in the evaluation of student testing, and the accuracy that is achieved with the CBE system. An increase in student performance and positive acceptance by 70% of students has encouraged its use in the educational system. Instructor's perception of its reliability and validity as a positive contribution has also been established in the study. Some limiting factors such instructor anxiety while generating objective tests and not having the ability to observe written communications and thought processes of students have limited CBE applications.

Chapter V

Conclusions, and Recommendations

Restatement of the Problem

The vast responsibilities placed upon instructors at FVTC have forced them to use alternative evaluation devices in their course development. The inadequate amount of scheduled time for proficient student evaluation is insufficient. Computer based evaluation (CBE) is an effective device that can help faculty maximize use of their limited time. Currently, FVTC faculty in the Culinary Arts/Hospitality Program have little working knowledge of the efficiency and effectiveness offered by CBE.

Methods and Procedures

An interview method of 22 identical questions was used when gathering data from six FVTC Culinary/Hospitality Instructors'. Additional questions were asked to insure the proper comprehension and interpretation of the data reported. The results were later tabulated and compared to additional research of literature findings. The final analysis was presented in Chapter Four.

Major Findings

The benefits of CBE can be seen in its ability to minimize instructors time evaluating students testing results. CBE was also found to be a reliable and valid form of evaluation if properly developed and used in an appropriate manner. However, instructors also expressed their concern of limiting the students evaluation to answers from test questions and not having the ability to monitor communication ability and thought process on students tests.

Conclusions and Recommendations

Objective number one was to determine the guidelines for the successful implementation of a computer-based evaluation system. Based on the data it can be

concluded that success of the CBE system at FVTC has relied on its careful application to its courses, and an operating system that addresses the needs of the administration, staff, and students. Effective communication and commitment has allowed FVTC to produce a system that meets the desired criteria and expectations of the culinary/hospitality program. However, instructors did express a need to consider implementing an updated CBE system that will allow the instructors to perform additional desired capabilities. Based on the conclusion it is recommended that FVTC continue to support the CBE system through their current guidelines. An effort to locate an updated CBE system is recommended, but careful evaluation of such a system and its capabilities needs to be assessed to determine if the new system meets the criteria desired at FVTC.

Objective number two was to determine the benefits of computer based evaluation vs. traditional paper pencil testing as viewed by instructors. Based on the data it can be concluded that instructors have implemented an efficient and effective CBE system that allowed them to reduce evaluation time by as much as 80% while also increasing the accuracy of scored data. Instructors clearly felt the CBE system was a necessity for their current situation due to the time constraints and number of students in courses. Interpretation of students approval of the CBE system as viewed by instructors was very positive. The combination of the interview findings and the statistical results would seem to indicate that students were not put at any significant disadvantage by the CBE system. The accessibility of CBE tests, or the design and format of CBE tests as compared to the written form may influence these findings. Based on the conclusion it's recommended that FVTC instructors' consider expanding the CBE system to additional courses not currently using the CBE system. The possibility to decrease evaluation time needed by instructors is very possible.

Objective number three was to determine the causes of instructor anxiety of computer based evaluation. Based on the data it can be concluded that computer anxiety appeared to have a minimal amount of impact on instructors ability to operate the CBE system. Factors such as age, lack of computer training, improper developed the CBE system was not apparent. A greater anxiety was apparent with the actual development of questions to be used on the CBE tests but had no connection with the operation of computers. Based on the conclusion it's recommended that instructors continue their education and familiarity with the development of evaluation instruments through educational courses available at FVTC. The results of such a course may allow instructors to develop curriculum evaluation devices more efficiently.

Objective number four was to determine the reliability and validity of computer based evaluation versus paper/pencil testing. Based on the data it can be concluded that Culinary/Hospitality instructors feel that the use of CBE examinations are a reliable and valid form of evaluation when properly developed. Results showed that 70% of the instructors felt the use of CBE is a reliable form of evaluation. It was also shown that 70% of them felt the use of CBE is a valid form of evaluation. Based on the conclusion it's recommended that when CBE is implemented into a course, proper development and maintenance of the CBE system is necessary to ensure that the evaluation system will be both reliable and valid.

Recommendations for Further Study

Further research needs to be conducted to confirm these research findings. These studies could include the reliability and validity of CBE evaluation and how these evaluations impact students learning abilities in various situations and environments. It would also be advised to perform a replication of this study with various educational influences such as different program courses, and different types of CBE systems to

determine the efficiency and effectiveness of such courses on instructors and student learning as compared to these findings.

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Appendix A

Interview Questions

Age:

Sex:

Number of years of professional experience:

Number of years of educational experience:

Number of years of instructional experience:

1. Have you ever used Computer Based Evaluation (CBE)? When, How often, Why?

2. How do you feel about the use of CBE as an instructor's tool? Tool for students?

3. What advantages have you observed from the use of CBE?

4. What disadvantages have you observed from the use of CBE?

5. What advantages have you observed from the use of Paper/Pencil Evaluation?

6. What disadvantages have you observed from the use of Paper/Pencil Evaluation?

7. How many initial hours did you spend setting up the CBE system?

8. How many hours do you spend updating your CBE system?

10. How many initial hours did you spend developing your Paper/Pencil Evaluation?

11. How many hours do you spend updating your Paper/Pencil Evaluation?

12. How many hours a week do you spend evaluating student evaluation instruments?

13. Do you feel that you have adequate time to spend on students evaluation? CBE? Paper/Pencil Evaluation?

14. Do you feel that CBE is a necessary educational device to allow instructors to effectively practice time management and allowing them to be more effective as educators?

15. What was your impression of student acceptance of CBE? Performance results of students?

16. Do you feel the use of CBE is a valid form of student evaluation as compared to Paper/Pencil Testing?

17. Do you feel the use of CBE is a reliable form of student evaluation as compared to Paper/Pencil Testing?

18. Do you feel any anxiety when using the computer for word processing, research device, etc.?

19. Do you feel any anxiety when using CBE? If so, what kind and how do you cope with it?

20. Does the institution offer training, seminars, or instructor support staff to aid instructors with the development and updating of the CBE system? What type?

21. Did you have any support from the institution in the development of the CBE? If so, what type and what level of assistance were made available to you?

22. What is required of you and the institution for the successful implementation of a CBE system?