The Need for an Introductory Computer Literacy Course at the University Level

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Abstract

This paper will investigate the need for a Computer Literacy course for freshmen entering a four-year college. Most of the entering freshmen at our university enroll in a computer literacy course called "Introduction to Computers". In this course students will learn effective strategies for learning and applying microcomputer software including word processing, spreadsheet, presentation and database management. The course introduces concepts, terminology, and tools of the microcomputer software operating and application system environment. Introduction to the effective utilization of networking for communication, research, and information downloading is also incorporated in the course. Emphasis is on preparing the student to use computer technology effectively in education and work environments.

This study will investigate the knowledge of the incoming freshmen at the beginning of the course by administering a pretest. Their knowledge at the end of the semester will also be evaluated by means of a posttest. The pretest and posttest scores will be compared to ascertain whether the students have increased their knowledge base and skill set. The need for offering such a course in future will also be discussed. The pretest and posttest scores will be compared and analyzed using statistical techniques to ascertain:

1. Have the students gained additional knowledge from the class?
2. Is the difference in their pretest and posttest scores statistically significant?
3. Should our university continue offering this course in the future?

OBJECTIVE

Computers have fundamentally altered how we live and work, as well as how we learn and have transferred the world into a global community[1]. Hence it has become imperative that students are computer literate. Many business students are introduced to information systems via computer literacy coursework and/or assessment tests[3]. The objective of this research is to investigate the need for a Computer Literacy course for freshmen entering a four-year college. There is a school of thought that such a course is not needed nowadays since the entering freshmen have already learned computer competencies at the high school level. Virtually 100 percent of students use word processors and utilize the Internet for coursework. But the impression of broad competence slips when percentages are revealed for use of other applications, such as those for presentation development (65%), spreadsheets (63%), graphics (45%), or creating Web pages (25%)[2]. Although just about everything is on the Internet, will graduates have the skills they need to find the right information, assess its value and interpret it.[5]

BACKGROUND

This research was conducted in a university set in a rural community. The university delivers a strong and affordable education for friendly, ambitious students who thrive in a student-focused learning environment defined by small class sizes and faculty committed to teaching and student success. Academically, the University offers 143 undergraduate degree programs, including 12 associate level degrees and 131 baccalaureate degrees in four colleges — Caudill College of Arts, Humanities and Social Sciences; College of Business and Public Affairs; College of Education; and College of Science and Technology — and 20 academic departments. There are 70 graduate degree programs plus one education specialist program in five specialty areas also is offered. A master's degree for physician assistants, social workers and a cooperative doctoral program, all in collaboration with the flagship university in the state, are available on the our campus. A doctoral degree in education began in fall 2010. Classes are offered at regional campuses. Additionally, the University offers a number of distance learning courses throughout the region via the Internet and interactive compressed video. The instructional plant includes 120 classrooms and 112 laboratories. Statistically, the University has awarded more than 55,000 degrees and currently has more than 1,100 full-time employees. Enrollment for fall 2010 was more than 9,000, with the student body representing 106 counties in the state, 42 states and 35 foreign countries.

Most of the entering freshmen at our university enroll in a computer literacy course called "Introduction to Computers". In this course students will learn effective strategies for learning and applying microcomputer software including word processing, spreadsheet, presentation and database management. The course

introduces concepts, terminology, and tools of the microcomputer software operating and application system environment. Introduction to the effective utilization of networking for communication, research, and information downloading is also incorporated in the course. Emphasis is on preparing the student to use computer technology effectively in education and work environments.

Students enter the university with an expectation to use information technology in their courses (Rickman & Grudzinski, 2000), but most of them are not prepared for this. Our study assessed the knowledge of the incoming freshmen at the beginning of the course by administering a pretest. Their knowledge at the end of the semester was evaluated by means of a posttest. The pretest and posttest scores were compared to ascertain whether the students have increased their knowledge base and skill set. The need for offering such a course in future will also be discussed.

METHODOLOGY

A pretest comprising 50 questions and covering topics such as - Computer concepts, Word processing,
Spreadsheet analysis, Database management, Presentation graphics, Internet and world wide web - was administered to the students within the first two weeks of class during a semester. Their scores were recorded. The same test was administered at the end of the semester and the scores recorded. The pretest and posttest scores were compared and analyzed using statistical techniques to ascertain the answers to the following questions:

1. Have the students gained additional knowledge from the class?
2. Is the difference in their pretest and posttest scores statistically significant?
3. Should our university continue offering this course in the future?

THE STUDY

The pre-test and post-test exams had questions from the following topics:
- Windows Concepts
- MS Word
- MS Excel
- MS Powerpoint
- MS Access
- Internet Explorer
- MS Expression Web
- Computer Concepts

The study was conducted in several sections of the "Introduction to Computers" class. The sample size was 105. The sample consisted of 66 females and 39 males. The pretest average was 58.12%. The posttest average was 74.50%. There was a definite improvement in the grade between pretest and posttest. Table 1 below summarizes the results. The median has improved by 20 percentage points, indicating that the entire class performed better after the course, as compared to the beginning of the course.

Table 1: Comparison of the pre/post test results

	Pretest	Posttest
Minimum	33%	51%
Median	58%	78%
Average	58.12%	74.50%
Maximum	80%	92%

Tests were conducted to ascertain if the results were statistically significant. The technique that allows practitioners to compare two or more populations of interval data is called the *analysis of variance* and it is an extremely powerful and commonly used procedure. The analysis of variance technique determines whether differences exist between population means.

The null hypothesis will state that there are no differences between the pretest and posttest means. Hence,

$$H_0 : \mu_{pretest} = \mu_{posttest}$$

The analysis of variance determines whether there is enough statistical evidence to show that the null hypothesis is false. Consequently, the alternative hypothesis will specify the following:

H_1 : $\mu_{pretest}$ is not equal to $\mu_{posttest}$

The next step is to determine the test statistic. The ANOVA test was done using MS Excel 2010. The results are reproduced below.

ANOVA: Single Factor
SUMMARY

Groups	Count	Sum	Average	Variance
PRE	105.000	61.030	0.581	0.010
POST	105.000	78.220	0.745	0.009

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1.407	1.000	1.407	150.266	0.000	3.887
Within Groups	1.948	208.000	0.009			
Total	3.355	209.000				

The F-Value of 150.266 (significance level of 0.000) indicates that the differences between the pretest means and posttest means was greater than that which could be expected by chance. Thus, there was a significant gain in student knowledge because of taking the course. Consequently, students who took the class were able to improve their understanding, learning and using the concepts that they learnt by enrolling in the class.

CONCLUSION

"Entering freshmen nowadays do not need an introductory computer class since they have learnt all the necessary computer skills at the high school level" is a very prevalent theory among many academics especially in our university. This research tested this theory and statistically proved that this theory is wrong. Students do not learn all that they need to be a successful university graduate at the high school level. They will benefit from taking an introductory "Computer" course.

The three questions posed at the beginning of this paper are reproduced here with the answers from this research.

1.   Have the students gained additional knowledge from the class?
        The answer: YES.

2.   Is the difference in their pretest and posttest scores statistically significant?
        The answer: YES.

3.   Should our university continue offering this course in the future?
        The answer: YES.

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