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The effect of student opinions about course content on student engagement and achievement in computer literacy courses

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Abstract

The study investigates whether student opinions about course content relate to achievement and how their opinions characterize them about engagement with coursework in computer literacy classes. 212 undergraduate students' achievement, opinions about course content, and engagement with coursework were identified in fall 2007. Students were asked to list the topics they found beneficial and unbeneficial. According to the results, students who found the least favorite topic unbeneficial were less successful. Students with different opinions about the content had different engagement characteristics, too. Findings are a call for more careful consideration of student opinions for improved overall success in school.

Keywords: Course content preferences; motivation; prior knowledge; student engagement; computer literacy; achievement.

1. Introduction

It is faculty's observation in computer literacy classes that undergraduate students show low interest in the course. When asked, many students complain about course content, saying they do not find some of the content beneficial. This is obviously a problem that educators would not want to encounter in educational settings.

Motivated by this problem, this study investigates (1) whether student opinions about course content relate to classroom achievement and (2) how their opinions characterize them in terms of engagement with course related activities.

Literature shows that students that are motivated are more successful in their coursework (Eccles & Wigfield, 2002; Garfield, 1995). Literature also shows that students who are engaged with schoolwork have better achievement results (Kuh, Kinzie, Cruce, Shoup, & Gonyea, 2006; Garfield, 1995; Oncu, 2007). This perspective prescribes a linkage between student motivation, engagement, and achievement; and a combination of these instructional variables has been studied in different research settings (Oncu, 2007; Linnenbrink & Pintrich, 2003).

Motivation is about student beliefs of succeeding in, liking or disliking, or valuing or disvaluing something. These concepts can be considered incentives on the student's part to invest the necessary effort to succeed in a learning-related endeavor (Ames, 1990). Motivation, appearing to be the initiator of the problem in this current

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study, can be expressed in many different forms, or categories (Eccles & Wigfield, 2002). Theories focusing on student interest are one of those motivational categories. According to this theory, students show interest towards certain features of instructional elements or they find value in performing certain instructional tasks. Although hard to distinguish from each other, interest theories can be organized under individual interest and situational interest. Especially the individual interest has been linked with deep-level learning (Schiefele, 1999), which could be located at the higher end of the learning curve in Bloom's taxonomy of learning (Bloom, Engelhart, Hill, Frust, & Krathwohl, 1956).

Considering course content to be an important instructional element, this study barrowed the concept of interest theory of motivation to identify whether the topics arousing higher student interest can also be linked to higher student achievement and engagement.

As discussed throughout the instructional technology literature such as Posner and Strike (1976), interest is one of the factors that have to be considered when designing instruction. According to Morrison, Ross, and Kemp (2007) especially when sequencing instruction, topics that stimulate higher student interest should be taught prior to other less interesting topics. As this principle suggests, topics with low student interest shall not necessarily be removed from a lesson, but rather the importance given to them should be lessened. This study is an example on that trend to link students' opinions on course topics to student success and engagement.

2. Methods

The course, in question, teaches basic information about computers, such as history of computers, software and hardware terms; Windows XP; and partially MS-Office program such as M.S. Word and M.S. Excel. A pre-survey, a mid-survey, and a post-survey were conducted during fall 2007. This study incorporated items from the mid survey and the post survey.

The mid-survey provided the qualitative data on student opinions about course content. It was administered at the fifth week of classes and sought answers from students to the questions given below in an open-ended style:

- What are the three topics so far that they found the most necessary (or beneficial)? And why? (Students were asked to write down *three* topics.)
- What is the topic so far that they found the least necessary (or least beneficial)? And why? (Students were asked to write down *one* topic.)

The post-survey provided data on student engagement via questions adapted from the National Survey of Student Engagement 2006. The post survey included 13 items inquiring students' level of participation in school related activities. Students were asked to rate their perceived participation through four-point likert scale items (where 1 = "never" to 4 = "very often") such as "discussed grades or assignments with an instructor" or "asked questions in class or contributed to class discussions." From four different departments of the faculty of education, 212 students answered all three surveys.

A final exam was conducted at the end of the semester to determine students' achievement scores. An ex post facto research methodology (Cohen, Manion, & Morrison, 2000) – also known as causal-comparative research methodology (Fraenkel & Wallen, 2003) – was adapted to study the research setting. As a part of that methodology separate ANOVAs were run to identify the linkages between student opinions, student engagement and student achievement. Specifically, student opinions were independent variables, and student achievement and engagement were dependent variables.

Student opinions were quantified in a previous study on the same setting to allow for statistical access (Öncü, Şengel, & Delialioğlu, in preparation). Two variables were created for each content topic based on a predefined list of subjects that are thought in the course: the most necessary (referred as "necessary") and the least necessary (referred as "unnecessary" for ease of understanding). In the previous study it was found that students most frequently mentioned the topic of "health and computers" (referred as "health" throughout the paper) as necessary and "history of computers" (referred as "history" throughout the paper) as unnecessary.

3. Findings and Results

Based on the scope of the study, topics that are taught in the first five weeks of the classes were put into consideration. Table 1 shows the topics students are traditionally taught in the first five weeks of the computer literacy classes.

Table 1. Subjects that are taught in the first five weeks of the computer literacy course.

General Concepts of Information Technologies	Windows Operating System
History of computers	Basic Information
Structure of computers	Starting up the Computer
Capacity and size of computers	Basic Concepts
Processing structure of computers	What are on Desktop?
Binary System	Running and Exiting Programs
Fundamentals of computers	Shutting down the Computer
Uses of computers (application areas)	Program Windows
Hardware and software concepts	Using Mouse
Hardware structure of computers	Using Keyboard
Mainboard (motherboard)	Opening Documents
Central Processing Unit	Seeking Help
Mathematic processor	Going Beyond Basic Information
Ports	Browsing the Computer
Memory Units	Organizing Files and Folders
Input – Output Units	Working on a Document
Modem	Printing
Power Supply	Installing Printers
Light Pen	Installing Programs
Optic Mark Reader	Installing Hardware
Joystick	Using Windows Efficiently
Barcode Writer-Reader	Moving or Copying Files Quickly
Software	Creating Shortcuts
Program, Data, and Programming Language	Keeping Programs Ready
Programming Languages and Compilers	Working with Windows
Software Package and Application Software	Enjoying Windows
Operating Systems	System Maintenance
Viruses	Other Windows Operations
Computers and Health	Joker Characters
	Find
	Taskbar
	Start Menu
	User Accounts
	Formatting Drivers
	Emptying the Recycle Bin
	Internet Connection
	Right Click Menu
	Logging off
	Keyboard Shortcuts

Table 2 and Table 3 summarize the results of the study. Specifically, Table 2 shows the student achievement results organized by the student opinions on health and history. Table 3 shows the student engagement results organized by the student opinions on health and history.

In this study, both topics (health and history) were evaluated from two perspectives – whether they were thought to be necessary or unnecessary by the students. The results indicated that mentioning any of the topics either of the most or the least necessary did predict how successful the student was in the course. Table 2 lists the mean achievement scores of the students who mentioned vs. did not mention each of the topics. As seen in the table, the trend is that students mentioning health or history as unnecessary were less successful than their counterparts [F(1,262)=5.17, p<.05; F(1,262)=6.64, p<.01, respectively].

Table 2. ANOVA results for student achievement by the perceived necessity of the topics health and history of computers.

	History						**Health**					
	Necessary p = ,001			**Unnecessary** p = ,011			**Necessary** p = ,001			**Unnecessary** p = ,024		
	0	**1**	**Total**	**0**	**1**	**Total**	**0**	**1**	**Total**	**0**	**1**	**Total**
N	191	75	266	155	109	264	94	173	267	258	6	264
M	68,08	72,44	69,31	70,75	67,59	69,44	66,55	70,8	69,30	69,65	60,42	69,44
SD	10,29	8,24	9,94	8,95	10,91	9,91	11,76	8,42	9,92	9,69	15,43	9,91

1 = Mentioned the topic; 0 = Did not mention the topic.

Also seen from Table 2 is that students who mentioned health or history as necessary were more successful [F(1,265)=11.60, p<.01; F(1,264)=10.75, p<.01, respectively] but, passing to Table 3, they less frequently worked in groups during laboratories than their counterparts [F(1,260)=7.874, p<.01; F(1,261)=4.257, p<.05, respectively]. The latter also more frequently studied with their friends outside of classes [F(1,259)=4.550 p<.05]. Students who found history unnecessary less frequently used ideas – learned from other resources – in class-related discussions [F(1,257)=4.102, p<.05].

Table 3. Mean scores of the engagement items organized by student opinions

	History				**Health**			
	Necessary		**Unnecessary**		**Necessary**		**Unnecessary**	
Items characterizing student engagement	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**
Asked questions in class or participated in class discussions.	2.08	2.04	2.05	2.10	1.99	2.11	2.06	2.40
Worked in groups with other students during laboratory sessions.	2.60	2.25	2.49	2.55	2.65	2.41	2.51	2.80
Worked in groups with other students outside classes.	1.89	2.07	2.03	1.84	1.76	2.04	1.94	2.25
Discussed educational plans relating to class with an instructor or an assistant.	1.29	1.36	1.34	1.28	1.27	1.34	1.31	1.40
Discussed job plans relating to class with my instructor or an assistant.	1.25	1.26	1.25	1.24	1.23	1.27	1.24	1.40
Discussed ideas from class or related resources with instructors outside classes.	1.42	1.47	1.44	1.43	1.43	1.43	1.43	1.80
Received feedback from my instructor or an assistant about course topics.	2.16	2.34	2.25	2.13	2.10	2.27	2.20	2.60
Interacted with an instructor or an assistant outside classes.	1.71	1.69	1.70	1.73	1.69	1.71	1.71	1.75
Received help or support from my instructor or an assistant about the course.	1.91	1.96	1.92	1.94	1.95	1.91	1.93	1.80
Helped or taught other students on the course topics.	1.91	1.97	1.96	1.89	1.85	1.97	1.93	2.00
Discussed my grades or the exams with my instructor.	1.36	1.29	1.36	1.30	1.32	1.36	1.34	1.20
Worked harder than I expected to meet the instructor's expectations.	2.26	2.20	2.20	2.28	2.17	2.27	2.24	1.80
Used ideas or concepts from other courses for assignments or class discussions.	2.01	2.16	2.13	1.92	2.00	2.07	2.04	2.20
Mean engagement score.	1.80	1.82	1.83	1.78	1.77	1.82	1.80	1.96

Shows significant difference between framed mean scores for the topic in question.

4. Conclusions and Recommendations

As students' opinion of whether a topic is beneficial or not can be an indicator of student interest and therefore an indicator of motivation, findings concur with the literature, linking motivation to achievement; i.e., motivated students are more successful. The findings, though, should be evaluated with a slightly different definition of motivation in our study. Motivation is student readiness before intervention; whereas our students expressed their feelings in the mid-survey. That is after some time the course has started. Moreover, our findings show that student

opinions do relate to student engagement in schoolwork. Considering the literature linkage between engagement and student achievement, findings are a call for more careful consideration of student opinions for improved overall success in school.

In this perspective, two topics – "history of computers" and "health and computers" – lay at the center of students' interests. Therefore, this study concentrated its focus on these two topics; future studies can repeat this study with more topics in question to come up with a road map for computer literacy classes. Considering how technology is shaping our future, identifying such topics that characterize student interests shall help create more effective courses.

It shall be noted here that the results regarding engagement were reported on individual engagement items from the survey to characterize student behaviors. These are as to picture how the students who had different opinions to start with behaved in the class. On the other hand, student opinions did not turn out to be a significant determinant on the mean engagement scores.

Regardless of the topic, the students who found the topics beneficial were more successful. However, those same students were less frequently working in groups with other students during laboratory sessions of the classes. The reason may be that during the laboratory sessions each student works on individual computers. This isolates them from interacting with their peers. Finding that those motivated students were not participating in activities that improve student engagement (and apart from wondering why they are not engaged), there still seems to be room for improvement in terms of engagement. Activities can be organized to pull motivated students into team work in laboratory sessions to help solve this problem. Such activities may include the instructor's request from those motivated students (because they appear to be more successful) to help the less advanced students on the laboratory issues.

Results also interestingly show that for a student to find the most favorite topic beneficial was related with more team work outside the classes. Similarly, finding the least favorite topic unbeneficial meant less frequent use of ideas or concepts from other courses for assignments or class discussions. These two results are indications that aligning topics with student interests shall increase student engagement with coursework. Following the contribution of student engagement on student achievement from the literature, interventions on course topics in such a direction shall result with better student success.

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