Coaching Style Teaching Strategy in Hands-on IS Courses

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ABSTRACT

The purpose of this article is to describe the advantages of introducing a coaching style teaching strategy in a hands-on information systems course for non-information systems major undergraduate students. The outcome of teaching information systems courses to non-information systems majors was low grades and withdrawals and it was ultimately leading to student dissatisfaction. After implementing several teaching strategies, the coaching style teaching strategy was found to work best in decreasing withdrawals and failures as well as increasing student engagement in the course.

Keywords: Coaching Style Teaching Strategy, Active Learning, Spreadsheet, Database, Hands-on Courses

1. INTRODUCTION

Many studies describe the challenges of teaching core introductory information systems (IS) courses for non-IS majors (Forte & Guzdial; Kock, Aiken, & Sandas; Nagappan et al.). These challenges have led to failures and dissatisfaction in courses (Forte & Guzdial). Researchers have offered several solutions to address these challenges (Barnes et al.; Kurkovsky). Searching for an appropriate teaching strategy is the spirit of these efforts to better address students' needs.

An IS course was examined for four semesters as a case study. After three semesters of teaching the Problem Solving with Business Tools course to undergraduate students majoring in business, a generic trend emerged. In that more than 10% of students were either withdrawing from the course by the midterm or failing at the end of each semester. Course evaluation surveys (see section 2.4 for results) did not indicate the source of the problem. In fact, results indicated a high level of satisfaction. Various techniques were introduced each semester to prevent withdrawals and failures; however, none of them proved to be effective in stopping the trend. A fundamental change in teaching style made the desired impact on student success while keeping the student satisfaction level high. This article describes the advantages or prolific outcome of introducing a coaching style teaching strategy in the Problem Solving with Business Tools course.

The Problem Solving with Business Tools course covers 15 to 16 weeks of introductory and intermediate level topics in a spreadsheet software (Microsoft Excel) and introductory level topics in a database software (Microsoft Access). Two thirds of the semester is dedicated to the spreadsheet while the remaining one third is dedicated to database topics. The course is offered to business majors. Most enrolled students are freshman, along with a few sophomores.

2. FINDINGS

2.1. Factors behind Teaching Strategy Change

2.1.1. Failures and Withdrawals

The number of failures and withdrawals contributed to changing the teaching strategy. The percentage of withdrawals and failures ranged from 11% to 20% in the first three semesters with lecturing-based teaching (see Table 1). While some withdrawals may be associated with factors unrelated to the course, withdrawals coupled with failures indicated a discouraging trend.

	Fall '09	Spring '10	Fall '10	Spring '11
Initial Class Size	24	27	30	24
Withdrawals	1	0	4	0
Failures	2	3	2	0
Percentage of Withdrawals and Failures	13%	11%	20%	0%

Table 1 - Failures and Withdrawals

2.1.2. On-time Submission of Assignments

The course offered twelve assignments and one final project providing the students sufficient opportunity to gain the necessary spreadsheet and database skills. Following up on the deadlines and acting on time are challenges for many freshman students, who are in the process of adjusting the college environment. Three submission deadlines were provided to students for submitting their assignments by early deadline for an extra 0.5 point reward, by regular deadline for 4 points full credit, and by late deadline for 1 point penalty for each assignment. Students who frequently missed their assignment submissions ended up losing up to 4 points for each assignment (up to a total of 48 points by the end of semester). Missing assignments eventually led to failures or withdrawals (see Table 2).

Grade	Fall '09	Spring '10	Fall '10	Spring '11
A	0	0.4	0	0
A-	0	0	1	0
B+	0	0	0	1
B	0	0.7	1	0
B-	0.5	0.5	1	0
C+	0.5	2.5	0	0
C	0	0	1.5	2.8
C-	1.5	0	1.5	3.3
D+	0	3	1	5.3
D	2	3	0	0
F	12	9	10.5	0

Table 2 - Average missed assignment submissions by grades

A table in Appendix A describes the number of missed assignment submissions by percentage of students by grades.

2.1.3. Lack of Student Stimulation

The literature indicates that stimulating non-IS majors' interest in introductory IS courses is an important challenge in Problem Solving with Business Tools. *'Stimulating students' interest'* was one of the lowest rated questions (average: 3.66 out of 5) in course evaluation surveys.

2.1.4. Divide between Student Skills

A serious divide exists between students per their ability to follow the application development instructions. While almost half of the students are acquainted and experienced in using applications, the other half of the students' exposure to the applications is very limited and basic computer skills, such as creating folders, keyboarding rapidly, and downloading and uploading files, etc. were lacking.

2.1.5. Additional Factors

Course evaluation surveys tested factors that may have impacted the learning of the course. Students rated various critical factors highly, such as impact of the course on their education, being informed about the evaluation criteria, teacher's competency with subject matter, teacher's concern with student progress, assignments and exams related to course, and teacher effectiveness. High ratings directed the researcher's attention to other factors that might lead to failures and withdrawals. The researcher looked at factors that were not rated highly, to understand the outcome of failures and withdrawals.

2.2. Lecturing versus Coaching

Lecturing was used in the first three semesters; coaching strategy was adopted in the fourth semester. Each strategy requires a different level of focus on content, allocation of time, and interaction with students (see Table 3).

Lecturing was the main instrumental tool in teaching case context and step-by-step instructions of technology solution development in the first three semesters. In the lecturing approach, the teacher gives a detailed description of the case and lectures step-by-step instructions. Instructions are divided into manageable groups in which students can complete the task themselves after the teacher's demonstration. For example, applying four or five formatting tasks (bold, italic, merge and apply borders) in a range of cells was an instruction group that the teacher first demonstrated. At the end of each instruction group, the teacher checked student progress and answers questions. When all students are ready to move forward, the teacher starts the next group of instructions.

Problems started to emerge as the chapters became increasingly complicated in the course. As the teacher was checking the progress of students and answering their questions after each group of instructions, high performing students were losing interest in the class while waiting for the next group of instructions. Many high performing students chose to complete the tasks themselves by following the textbook instead of waiting for directions. In this case, high performing students were missing critical points or common mistakes included in the teacher's presentations. Although students following the presentations posed relevant questions on the lecture, self-directed students posed questions from other parts of the textbook. Sometimes students helped each other in overcoming certain issues, but peer teaching was generally limited among students.

Teaching Strategy	Lecturing-based Teaching	Coaching-based Teaching
Period	First three semesters	Fourth semester
Case context	Teacher describes in detail	Teacher describes in detail
Hands-on instructions	Teacher lectures step by step, hands-on instructions	Teacher discusses only the most important topics and common mistakes
Teacher's weekly time spent on	2 hours of lecturing and 1 hour of answering questions	½ hour of lecturing and 2½ hours of answering questions and tracking progress
Student involvement	Listening to case and instructions and applying instructions	Listening to case, reading instructions and applying instructions
Teacher-student interaction	Mostly limited to questions	Questions and progress discussions
Peer teaching	Limited	More common
In-progress grade evaluation reports	Frequent evaluation reports	Frequent reports and individual discussions
Emphasis	Information transmission and student skill development	Student skill development
Student motivation	Average	Better
Immediate verbal feedback from teacher	After each instruction group for lecture followers, delayed feedback for self-directed learners	Immediate one-on-one feedback for all students
Higher order thinking	Less challenging for students	More challenging for students

Table 3 - Lecturing vs. Coaching based Teaching Strategy

Withdraw and failure trends that emerged in the first three semesters (see Table 1) were closely related to assignment submission behavior (see Table 2). Low performing students were having hard time submitting their assignments on time and tracking their progress themselves. The lecturing strategy was restricting teacher-student interactions to one-way lecturing and questions after each group of instructions. As a result of these issues, a new strategy was introduced to increase the teacher's effectiveness in following student progress. The coaching based teaching strategy decreased the time allocated to lecturing from 2 hours per week to ½ hour and increased one-on-one interaction between students and the teacher from 1 hour per week to 2 ½ hours.

In the coaching based teaching strategy, the teacher only lectures on the case context in detail and briefly discusses common mistakes and critical issues at the beginning of each chapter. Students are responsible for reading all textbooks and follow each group of instructions from textbooks. The teacher focuses on student progress by having detailed information of student assignment submissions, missed classes, assignment and exam grades, in-progress grades, and projected grades. All this information is provided to students frequently (at least six times) throughout the semester in hardcopy form, as in the lecturing based strategy. In coaching, the progress and its implications on final grades are discussed in each interaction with the teacher. The coaching strategy provides more personal time for each student to reflect on their questions or their mistakes.

A comparison of lecturing and coaching from the active learning perspective (Bonwell & Eison) reveals important differences among these strategies (see Table 3). In coaching, the teacher's motivation is focused more on students' skill development rather than information transfer. This motivation decreases the lecture hours and increases individual interactions. This change also impacts student involvement by decreasing students' passive listening of instructions and promotes students to learn from textbooks. Students accustomed to self learning and exploring adapt to analyze and solve problems on their own, even before instructions are given. Given the dramatically increased time in which the teacher can dedicate greater individual interaction, students get instantaneous verbal one-on-one feedback during classes. Peer teaching is more common than lecturing in coaching as a result of the increased individual time in class, individual responsibility to learn topics and follow instructions. Despite the lack of significant change in student interest in the course, motivation to be part of the course activities (finishing the assignments, participating in final project, and attending classes) increased in the coaching style course.

2.3. Critical Success Factors in Coaching

2.3.1. Personal Attention

The frequent assignment submission schedule resulted in some students to lose interest as they started missing assignment submission deadlines. Personal attention is required to track students' progress and identify issues in learning. The coaching style enables teachers to provide more time to individual issues. Individual attention helps students better address their issues and keep up with the course schedule. Class size can become an important limitation in providing personal attention. In this case study, the class size was around 24 in each semester and providing personal attention was challenging only in teaching complex chapters. But this limitation opened a door for peer teaching. Students received help from their peers sitting next to them, when the instructor was not available.

2.3.2. Timely Feedback

The instructor's knowledge and skills are very critical in providing immediate one-on-one verbal feedback to students. Students' mistakes can sometimes produce complicated inaccurate assignment content. The teacher quickly recognizes the problem and solves it in class. Otherwise, the teacher won't have enough time to help other students.

2.3.3. Textbook: Easy-to-follow instructions

Easy-to-follow textbooks are critical for the success in this strategy. Students rely heavily on textbooks to learn topics. When students cannot understand or follow textbook instructions, the teacher is overwhelmed by the need to fulfill students' help requests. Textbook files should be available on the Internet or the learning management system, and students should be able to easily download and use them in their assignments.

2.3.4. Teacher's Ability to Use Tools

The teacher should also utilize spreadsheet or database tools to follow students' progress more effectively. Frequent and detailed feedback plays a critical role in success, and manual processing is not an efficient way to handle course information. Preparing in-progress reports takes time, and the teacher should develop customized applications that help process course information with less effort. A sample in-progress report is

2.3.5. *Motivation and Energy*

The teacher should also check students' motivation in learning the course topics during the feedback process. The teacher's energy in helping students can become an important motivation source for students. Early assignment submission rewards and late submission penalties are also an important part of students' motivation. Offering a once-a-semester resubmission facility for missed assignments could increase students' motivation to complete course requirements.

2.3.6. *Stop Cheating*

Cheating decreases students' learning and increases failures in this course. Students mostly cheat by using other students' finished assignments. In this case, the cheating student does not learn the topics and does not gain any hands-on experience on the application features. There are several ways to stop cheating. The first step is a strong message at the beginning of the semester. Students should be very well informed about the impact of cheating on their learning, official procedures, and implications of getting caught. Grading the material at the same time can help the teacher identify similar mistakes made by students. The teacher can review similar materials for mistakes to identify any cheating. Time-limited exams are also effective tools in preventing cheating. On these exams, students are challenged not only to provide correct information, but also their ability to apply their knowledge in short period of time. Knowing all these challenges upfront and in detail, students will better prepare themselves for the exams by simply doing their own assignments and studying harder.

2.4. Impact of the Coaching Style Teaching

This case study indicates that the coaching style teaching strategy in this spreadsheet and database course in the business context proved to be very effective in improving student success. The most dramatic impact was evident in withdrawals and failures (see Table 1). The coaching style helped students track their assignment submissions more effectively (see Table 2). In particular, low performing students benefitted from this style by submitting enough assignments to get a passing grade or a better grade in the course.

Average student grades increased from around 78% to 83%. This increase is the result of improvement in low performing students' grades. Although an increase in students receiving A grades occurred, the number of As and Bs earned did not significantly change from the previous semesters.

Course ratings were high in the first three semesters; that did not change in the fourth semester. Students continued to rate critical factors high, such as contribution of the course to students' education (4.25), clear objectives (4.08), teacher's preparation (4.42), teacher's competency (4.43), teacher's concern with student progress (4.5), timely exam returns (4.42), helpful feedback (4.13), teacher's enthusiasm (4.38), and teacher's effectiveness (4.21).

3. CONCLUSION

The coaching strategy was introduced to address major issues in the Problem Solving with Business Tools course offered to non-IS major students. High withdrawal and failure rates, delays or failures in assignment submissions, stimulation of students' interest in the course, and the divide in students' skills were the main motivational factors behind searching for a better match between teaching style and students' learning styles.

Inspired by the fundamentals of the active learning concept (Florida State University), the coaching strategy decreased the lecturing time and increased time for one-on-one student and teacher interactions and progress tracking. The strategy motivated students to participate in the class by taking control of their learning of the material through short lectures, textbooks, and hands-on activities. Having more responsibility and in-class time also fostered peer teaching without any official encouragement from the teacher. One-on-one interaction enabled the teacher to give more immediate feedback to students.

The coaching strategy requires a different set of skills and effort from the teacher. The teacher should give more personal attention to students in terms of dealing with their individual learning styles, following their achievements every week, and motivating them to complete their assignments on time. Timely feedback is critical to ensure that students move forward with their exercises and to prevent students from making the same mistakes in future assignments. Textbooks have to be easy to follow and self-explanatory for students with no or very elementary skills in these topics. The teacher's spreadsheet, database and computer skills should be at high level to increase efficiency in providing timely feedback to students by preparing frequent in-progress reports. The teacher's energy and enthusiasm toward the topics also impact students' motivation in the course. Appropriate measures should be taken to stop cheating in this course, which can easily become a major factor in withdrawals and failures.

The coaching style teaching in the Problem Solving with Business Tools course decreased the withdrawals from greater than 10% to 0%. It also increased the grade average of the class. Existing high ratings of student satisfaction were also preserved in this transition.

4. REFERENCES

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Appendix A –Number of Assignment Submissions Missed by Percentage of Students by Grades

			A	A-	B+	B	B-	C+	C	C-	D+	D	F
Fall 2009	Number of Assignment Submissions Missed	0	22%	9%	4%	9%	9%	4%	4%		4%		
		1					9%	4%		4%			
		2							4%			4%	
		3											
		4											
		5											
		6											
		7											
		8											
		9											
		10											
		11											
		12											9%
			A	A-	B+	B	B-	C+	C	C-	D+	D	F
Spring 2010	Number of Assignment Submissions Missed	0	22%	7%	4%	4%	4%						
		1	4%			7%	4%	4%				4%	
		2	4%					4%					
		3					4%				4%		
		4						4%					
		5										4%	
		6											
		7											
		8											4%
		9										4%	4%
		10											4%
		11											
		12											
			A	A-	B+	B	B-	C+	C	C-	D+	D	F
Fall 2010	Number of Assignment Submissions Missed	0	27%		4%		4%	8%	4%			4%	
		1		4%		4%	8%			4%	4%		
		2					4%		12%	4%			
		3											
		4											
		5											
		6											
		7											
		8											
		9										4%	
		10											
		11											
		12											4%
			A	A-	B+	B	B-	C+	C	C-	D+	D	F
Spring 2011	Number of Assignment Submissions Missed	0	29%	13%		8%			4%				
		1			4%								
		2							4%		4%	4%	
		3							4%			4%	
		4							4%				
		5							4%			4%	
		6											
		7									8%		
		8											
		9											
		10											
		11											
		12											

Appendix B – An Example of In-progress Grade Report

	Your Grades	Min	Avg	Max	Notes
					ASSIGNMENTS
In.	2.00 / 2	0.00	1.69	2.00	
1	3.25 / 4	0.00	2.95	4.00	(E) Missing Printouts; Incorrect Printouts;
2	3.75 / 4	0.50	3.25	4.00	(E) Iowa: Not prepared for printing;
3	3.75 / 4	2.00	3.76	4.00	(E) Drake: Missing formulas in savings table;
4	4.00 / 4	2.00	3.76	4.00	(R) Excellent assignment. Congratulations.
5	3.00 / 4	0.00	3.08	4.00	(R) Bowls: Missing tasks;
6	0.00 / 4	0.00	2.40	4.00	(N) No submission.
7	3.75 / 4	0.00	2.29	4.00	(E) Rockisland: Q7 - Incorrect Adv.Filtering. Incorrect Q10-11
8	2.00 / 4	0.00	2.30	3.75	(R) Missing theatre.
9	3.50 / 4	0.00	2.70	4.00	(E) Missing printouts.
10	2.00 / 4	0.00	2.70	4.00	(R) Belmont: Incorrect relationship and field settings. Missing records. GEM: Missing relationship, records, and objects.
11	4.00 / 4	0.00	2.51	4.00	(R) Excellent assignment. Congratulations.
12	2.00 / 4	0.00	2.06	4.00	(R) Missing GEM.
					EXAMS
1	7.00 / 7	2.50	5.69	7.00	You are one the top student (along with 3 others). Congratulations.
2	6.65 / 7	1.85	5.12	7.00	You are one of the top two students (along with another student). Congratulations.
3	5.75 / 7	0.00	4.33	7.00	You are one of the top four students (along with another student). Congratulations.
4	7.00 / 7	6.50	6.96	7.00	Perfect exam. Congratulations.
5	7.00 / 7	0.25	5.50	7.00	Perfect exam. Congratulations.
					ATTENDANCE
	5 / 5	0.00	3.96	5.00	You missed the class once on 3/11 (EarlyS); 4/4;
					PROJECT
	/ 3				
	/ 7				
					EXTRA POINTS
	2.00	0.00	2.90	8.00	A1; A2; A3; A7;
	3	0.00	3.93	8.00	(1p) A6: Incorrect file names. Missing files. Incorrect formulas. (2p) A8: Theatre.
					TOTAL AND PROJECTED POINTS
Σ	80.40 / 90	42.15	71.74	95.90	Actual Grade Information
	89.33/100	46.83	79.72	106.56	Projected Grade Information

Projected Grade	**B+**	Points Lost:	Maximum Available Grade:	A-
		9.60	Minimum Available Grade:	B-

Good performance. Congratulations.
You did not submit or did get zero point from one assignment.