



# Using Online Courseware to Play a Simulation Illustrating the Concept of Moral Hazard in Health Care

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## **Abstract**

This article discusses the use of a popular online instructional management system to teach moral hazard by having students make decisions about whether to seek health care under two simulated scenarios – with and without insurance.

*JEL* classification: A20, G22, I11

## **1. Introduction**

Teaching economic principles to undergraduate and graduate students within the context of courses about health care systems has enormous value. Economic principles provide insights into how patients, providers and the institutions they represent behave. Insights gained by students in the classroom setting should help to better inform the decisions these students will make as health care leaders. Moral hazard is a particularly useful principle because of the implications about how those insured from loss due to illness or injury behave differently than those without insurance.

Classroom experiments, simulations, and games engage students in experiential learning about economic principles (Kagel and Roth, 1995; Friedman and Sunder, 1994), but they can be challenging to implement for students taught outside of the traditional classroom. Teaching students at a distance presents a number of challenges, and instructors can slip into the pitfall of focusing on the constraints rather than the opportunities (Larreamendy-Joerns and Leinhardt, 2006). The limitations of courseware designed to facilitate online instruction are amplified when used poorly (Foshay, 2002; Jonassen, 2002); however, as illustrated by the discussion of the moral hazard simulation that follows, the functions inherent in the software can be leveraged to produce teachable moments not easily replicated with face-to-face instruction. Although simply ‘hanging content’ on the Internet is a suboptimal practice that fails to take full advantage of the capabilities of internet courseware (Vrasidas, 2004), using an online course management system as a repository for lecture notes and other course content has migrated from distance education to become a common practice for all modes of course delivery (Brown, 2001).

Better practices involve using instructional software to experientially engage students in the consideration of alternatives and to promote active decision making. This article illustrates the use of a popular online instructional management system to have students make decisions about seeking health care under two scenarios, without and with insurance, during the play of a game designed by the author to illustrate the economic concept of moral hazard. In the context of health systems, moral hazard refers to the tendency for a person to seek health care in greater quantity and at greater cost with insurance than without. Intuitively, the concept makes sense, and this principle is invariably

illustrated in popular health economics and health systems texts (Feldstein, 2005; Folland *et al.*, 2010; Henderson, 2009; Morrisey, 2007), including the text used in one of the courses in which the online simulation is played to illustrate moral hazard (Getzen, 2010). Student play of the game represents an adaptation of experimental economics facilitated by the online courseware. Game play becomes a classroom experiment to determine whether students behave as predicted by the principle of moral hazard. Ortmann and Colandar (1997, p. 449) suggest that providing a classroom environment in which students experience economics has pedagogical advantages, and that 'experiments demonstrate to students subtleties that would otherwise be missed'.

The goals of this article are to:

1. describe how the online courseware was adapted to facilitate asynchronous, online play of the game by the students;
2. determine whether the results are reflective of behaviour influenced by moral hazard; and
3. determine the strategies used by the students while playing the game without and with insurance.

## 2. Playing the game

### *Set-up*

The game used to illustrate moral hazard is played in two parts – Part 1 is entitled 'Out-of-Pocket' and Part 2 is entitled 'Coinsurance and Deductibles'. Each student plays both parts of the game. The 'Out-of-Pocket' scenario is initiated with the instructions:

Players are self-employed contractors. Each player begins the simulation with an economic value of \$10,000 and makes \$3,000 quarterly. Each illness erodes the player's economic value through lost productivity ('Cost of Illness to Player') and each health care visit has the costs indicated by 'Cost of Care.' Players also have the option of undergoing an annual physical each year. Seeking care has an associated hourly time cost assessed at \$10 per hour. Seeking care eliminates the cost of the illness to the player ('Cost of Illness to Player'). Each player makes \$3000 a quarter and pays for health care out-of-pocket. Your goal is to maximise the 'Player's Cumulative Economic Value' at the close of the game.

The 'Coinsurance and Deductibles' scenario is initiated with the instructions:

Players are self-employed contractors. Each player begins the simulation with an economic value of \$10,000 and makes \$3,000 quarterly. Each illness erodes the player's economic value through lost productivity ('Cost of Illness to Player') and each health care visit has the costs indicated by 'Cost of Care'. Seeking care has an associated hourly time cost assessed at \$10 per hour. Players also have the option of undergoing an annual physical each year (to which the deductible and coinsurance apply). Seeking care eliminates the cost of the illness to the player ('Cost of Illness to Player'). Each player makes \$2500 quarterly after a quarterly contribution of \$500 to health insurance. The player pays for the care received until a \$75 annual deductible is reached; thereafter, the health insurance pays 80% and the player pays 20%. Your goal is to maximise the 'Player's Cumulative Economic Value' at the close of the game.

Game play is designed to illustrate the differences in players' responses to seeking health care when paying out-of-pocket and when paying a premium to be covered by insurance with a coinsurance and deductible. The game is played using Blackboard®, the online learning system software whose use is pervasive throughout the United States system of higher education. The Test function in Blackboard®

was used to improve an earlier version of the game which employed the static presentation of symptoms to players via spreadsheet (Kennedy *et al.*, 2005). Use of the Test function facilitated the random presentation of symptoms at each of 12 health events to which players responded. This produced a more realistic scenario than the earlier version of the game which used a spreadsheet to present the symptoms experienced by the players all at once. Astute players could game the earlier version of the simulation by looking ahead to see which symptoms would occur in the future. If player responses illustrate moral hazard in the current version of the game, then this result is produced within a more realistic simulation environment. Game play via internet courseware also improved recording of player responses.

In the current version of the game, three years in the life of the player are simulated. Under both the 'Out-of-Pocket' and 'Coinsurance and Deductibles' scenarios, the player sequentially 'experiences' a quarterly health event presented randomly as one of 12 possible symptoms. Each presenting symptom is identified as *Symptom A* or *Symptom B*, ... through to *Symptom L*.

**Table 1:** Presenting symptoms

Health Event	Cost of Illness to Player	Cost of Care	Time Cost in Hours
Symptom A	\$75	\$80	2
Symptom B	\$65	\$65	1
Symptom C	\$110	\$60	2
Symptom D	\$95	\$70	2
Symptom E	\$65	\$50	2
Symptom F	\$200	\$220	3
Symptom G	\$55	\$20	1
Symptom H	\$25	\$10	1
Symptom I	\$35	\$40	1
Symptom J	\$70	\$30	2
Symptom K	\$25	\$25	1
Symptom L	\$40	\$25	1

The player is also provided additional information characterising each symptom – the cost of illness to the player if health care is not sought, the cost of care if health care is sought, and the time cost in hours (valued at \$10 an hour) if health care is sought. Figure 1 illustrates the typical presentation of a symptom by the courseware.

**Figure 1: Presentation of a symptom by the courseware**

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2009 SPRING HEALTH CARE PAYMENT SYSTEMS \*601\* (HSMA3020601200930) > CONTROL PANEL > PREVIEW ASSESSMENT: WHOSE MONEY IS IT? [OUT-OF-POCKET] GAME

**Preview Assessment: Whose Money Is It? [Out-of-Pocket] Game**

**Name** Whose Money Is It? [Out-of-Pocket] Game

**Instructions** As symptoms are presented, indicate your decision to seek health care (yes or no). Record your answer and the economic consequences on the "Out-of-Pocket" worksheet.

**Multiple Attempts** Not allowed. This Test can only be taken once.

**Force Completion** This Test can be saved and resumed later.

**Backtracking Prohibited** This Test does not allow backtracking. Changes to the answer after submission are prohibited.

**Question Completion Status:**

**Question 1** 0 points [Save](#)

**Symptom E:**

Cost of Illness to Player: \$65

Cost of Care: \$50

Time Cost: 2 hours

**Will you seek health care?**

Yes

No

Moving to the next question prevents changes to this answer. Question 1 of 15 | ▶

At each presentation of a symptom, the player is asked ‘Will you seek care?’ and must submit an answer ‘Yes’ or ‘No’. Depending upon the scenario involved, if the player decides to seek health care, the player pays for the cost of care ‘out-of-pocket’ or seeks care under the provisions of an insurance policy with a deductible and coinsurance. While submitting the decisions made to seek or forego care as answers to a quiz presented via the courseware, the student also separately records his or her decision on a spreadsheet ledger to track both the economic consequences of that decision and the player’s cumulative economic value as shown by Tables 2 and 3 for the respective scenarios.

**Table 2: ‘Out-of-pocket’ worksheet**

Year	Health Event	Cost of Illness to Player	Cost of Care	Time Cost (Hours)	Value of Time (\$10/Hour)	Decision to seek health care? Answer "Yes" or "No"	Economic Value of Decision for Player	Quarterly Salary	Player's Cumulative Economic Value
									\$10,000
1	1							\$3,000	
	2							\$3,000	
	Annual Physical								
	3							\$3,000	
2	4							\$3,000	
	1							\$3,000	
	2							\$3,000	
	Annual Physical								
3	3							\$3,000	
	4							\$3,000	
	1							\$3,000	
	2							\$3,000	
	Annual Physical								
	3							\$3,000	
	4							\$3,000	
								Total	

**Table 3: ‘Coinsurance and deductible’ worksheet**

Year	Health Event	Cost of Illness to Player	Cost of Care	Time Cost (Hours)	Value of Time (\$10/Hour)	Coinsurance (20%)	Deductible Remaining	Seek health care? Answer "Yes" or "No"	Economic Value of Decision for Insurer	Economic Value of Decision for Player	Quarterly Salary Net of insurance	Player's Cumulative Economic Value
1	1						\$75				\$2,500	\$10,000
	2										\$2,500	
	Annual Physical											
	3										\$2,500	
2	4										\$2,500	
	1						\$75				\$2,500	
	2										\$2,500	
	Annual Physical											
3	3										\$2,500	
	4										\$2,500	
	1						\$75				\$2,500	
	2										\$2,500	
											Total	

The goal for the player is to maximise cumulative economic value at the conclusion of the simulated three years of play. After submitting his or her decision via courseware and updating the spreadsheet ledger, the player responds to the next symptom presented by the software.

At the conclusion of the second, sixth, and tenth quarters, the midyear point of each year, players are presented with the opportunity to undergo an annual physical. The cost of the physical is \$100 plus the hour time cost valued at \$10. There is no short-term cost of illness for declining the physical, because in real life the decision to forgo a physical seldom results in short-term health consequences that erode economic value. As with the presentation of symptoms, the player is asked ‘Will you seek care?’ and must answer ‘Yes’ or ‘No’. Including the annual physical facilitates the assessment of the value of physical examinations to students playing the game. Since selection of the physical always erodes the player’s economic value while foregoing the physical never has an economic impact within the three years of game play, selection of the physical suggests that the player places future value on the physical examination.

Each scenario played concludes after three years of simulated play. Players’ responses to the quarterly presentation of a health event (selected randomly with replacement as one of 12 symptoms) and to the three opportunities for an annual physical are recorded by the courseware. The player then submits the spreadsheet ledger, again via the Test function of the courseware, and responds to two questions: ‘What strategy did you employ in deciding whether to seek care during the “Out-of-Pocket” game?’ and ‘What strategy did you employ in deciding whether to seek care during the “Coinsurance and Deductible” game?’

The game was played most recently in the online courseware environment as an assignment for two undergraduate health care payments systems classes (one face-to-face and one distance education) and for a graduate health care systems and problems class conducted as a distance course. The undergraduate classes were coeducational and respectively consisted of 52 face-to-face and 55 distance education junior and senior health services management and health information management programme majors. The graduate course was coeducational and consisted of 25 graduate students pursuing a variety of health services management and health informatics concentrations and certificates at graduate level. Each class of students was graded on their participation in the game.

Participation was worth 2.5% of the course grade for the undergraduate students and 3% of the course grade for the graduate students. As part of the institutional review process, each student in the three classes was provided with a copy of the draft article and requested to provide explicit permission to use his or her responses from game play. The responses of students not granting explicit permission were removed from analysis. Forty-one of 52 students (78.8%) from the face-to-face undergraduate health care payments systems class, 37 of 55 students (67.3%) from the distance education undergraduate health care payments systems class, and 20 of 25 students (80%) from the distance education graduate health care systems and problems class provided permission.

Students in each of the classes played both the 'Out-of-Pocket' and 'Coinsurance and Deductibles' scenarios after signing into the online Blackboard® environment at the time and place of their choosing. Game play was self-moderated, but each scenario could be played in as little as 10 to 15 minutes. Resources required to play the game were available online. The courseware could be accessed via computer and internet browser. Student choices during both scenarios of game play were recorded by the quizzes supported by the courseware. Analysis of student responses was performed separately by downloading the response files in comma-delimited format and using Excel to perform the statistical computations.

### 3. Results

Game play clearly illustrates moral hazard. The one-tail paired-samples *t*-test for online game play by the face-to-face undergraduate health care payment systems students indicated that the students accessed care for symptoms significantly more frequently when paying premiums for insurance with a deductible and coinsurance ( $M = 7.76, SD = 2.48$ ) than when paying for care out-of-pocket ( $M = 6.88, SD = 1.71$ ),  $t(40) = 1.94, p = 0.030$ . The one-tail paired-samples *t*-test for online game play by the distance education undergraduate health care payment systems students indicated that the students accessed care for symptoms significantly more frequently when paying premiums for insurance with a deductible and coinsurance ( $M = 8.16, SD = 2.43$ ) than when paying for care out-of-pocket ( $M = 7.27, SD = 1.85$ ),  $t(36) = 1.99, p = 0.027$ . The one-tail paired-samples *t*-test for online game play by the distance education graduate health care systems and problems students indicated that the students accessed care for symptoms significantly more frequently when paying premiums for insurance with a deductible and coinsurance ( $M = 9.45, SD = 1.96$ ) than when paying for care out-of-pocket ( $M = 7.05, SD = 1.28$ ),  $t(19) = 4.71, p < 0.001$ .

Similar results were indicated when the cost of care for symptoms treated were examined. The one-tail paired-samples *t*-test for online game play by the face-to-face undergraduate health care payment systems students indicated that the cost of care for symptoms treated was significantly more expensive for students when paying premiums for insurance with a deductible and coinsurance ( $M = \$365.00, SD = \$205.29$ ) than for those paying for care out-of-pocket ( $M = \$290.37, SD = \$121.87$ ),  $t(40) = 1.91, p = .031$ . The one-tail paired-samples *t*-test for online game play by the distance education undergraduate health care payment systems students indicated that the cost of care for symptoms treated was significantly more expensive for students when paying premiums for insurance with a deductible and coinsurance ( $M = \$411.49, SD = \$172.05$ ) than for those paying for care out-of-pocket ( $M = \$302.16, SD = \$92.24$ ),  $t(36) = 3.32, p = 0.001$ . The one-tail paired-samples *t*-test for online game play by the distance education graduate health care systems and problems students indicated that the cost of care for symptoms treated was significantly more expensive for students when paying premiums for insurance with a deductible and coinsurance ( $M = \$486.25, SD = \$208.04$ ) than for those paying for care out-of-pocket ( $M = \$288.00, SD = \$104.65$ ),  $t(19) = 3.93, p < 0.001$ .

Between the second and third quarter of each year's game play, students also made a choice about whether to undergo an annual physical. Selecting the physical cost \$100 for cost of care and \$10 in time costs; there were no short-term costs of illness for foregoing the physical. Some students chose to

undergo an annual physical even though it eroded their economic value. Online game play by the face-to-face undergraduate health care payment systems students indicated that players chose to have a physical on average 1.61 times in a three-year period when paying premiums on insurance with a deductible and coinsurance compared to 1.34 times when paying out-of-pocket. A one-tail paired-samples *t*-test indicated that the difference was significant ( $M = 1.61$ ,  $SD = 1.12$  compared to  $M = 1.34$ ,  $SD = 1.09$ ),  $t(40) = 1.76$ ,  $p = 0.043$ . Since the cost of the physical is constant at \$100, compared to the earlier presentation of symptoms, the dollar relationship to the times physicals are selected is constant as well. Distance education students in the undergraduate health care payment systems class opted for a physical more frequently and a one-tail paired-samples *t*-test indicated that the difference in selection when players pay premiums for insurance with a deductible and coinsurance ( $M = 2.30$ ,  $SD = 1.05$ ) than when paying out-of-pocket ( $M = 1.62$ ,  $SD = 1.23$ ), was significant,  $t(36) = 3.29$ ,  $p = 0.001$ . Distance education students in the graduate health care systems and problems class also illustrated moral hazard when choosing to undergo a physical. A one-tail paired-samples *t*-test indicated that the difference in selection when players pay premiums for insurance with a deductible and coinsurance ( $M = 2.40$ ,  $SD = 0.94$ ) than for those paying for care out-of-pocket ( $M = 1.05$ ,  $SD = 1.28$ ), was significant,  $t(19) = 4.76$ ,  $p < 0.001$ .

Results of game play are summarised in Table 4.

**Table 4: Results**

Measure	Class	Payment Status	M	SD	N	<i>t</i>	<i>p</i> (one-tailed)
Accessed Care	Face-to-Face Undergraduate Health Payment Systems	Insurance	7.76	2.48	41	1.94	0.030
		Out-of Pocket	6.88	1.71			
	Distance Education Undergraduate Health Payment Systems	Insurance	8.16	2.43	37	1.99	0.027
		Out-of Pocket	7.27	1.85			
	Distance Education Graduate Health Care Systems and Problems	Insurance	9.45	1.96	20	4.71	< 0.001
		Out-of Pocket	7.05	1.28			
Cost of Care	Face-to-Face Undergraduate Health Payment Systems	Insurance	\$365.00	\$205.29	41	1.91	0.031
		Out-of Pocket	\$290.37	\$121.87			
	Distance Education Undergraduate Health Payment Systems	Insurance	\$411.49	\$172.05	37	3.32	0.001
		Out-of Pocket	\$302.16	\$92.24			
	Distance Education Graduate Health Care Systems and Problems	Insurance	\$486.25	\$208.04	20	3.93	< 0.001
		Out-of Pocket	\$288.00	\$104.65			
Chose Physical	Face-to-Face Undergraduate	Insurance	1.61	1.12	41	1.76	0.043
		Out-of Pocket	1.34	1.09			
	Distance Education Undergraduate	Insurance	2.30	1.05	37	3.29	0.001
		Out-of Pocket	1.62	1.23			
	Distance Education Graduate Health Care Systems and Problems	Insurance	2.40	0.94	20	4.76	< 0.001
		Out-of Pocket	1.05	1.28			

#### 4. Discussion

When presented with symptoms, moral hazard was illustrated by the students of all three classes. They sought care more frequently when insured and the cost of care sought was greater. Student completion of the spreadsheet ledgers forced students to consider the economic consequences of their choices and provided the instructor with the opportunity to check whether students understood how to calculate premium costs, out-of-pocket costs, and deductible and coinsurance cost-shares. Responses to the questions ‘What strategy did you employ in deciding whether to seek care during the “Out-of-Pocket” game?’ and ‘What strategy did you employ in deciding whether to seek care during the

“Coinsurance and Deductibles” game?’ served as the catalyst for discussion in the face-to-face undergraduate health care payment systems class which was recorded and viewed by the distance education class. The students in the graduate health care systems and problems class discussed their game play in an online chat session. Interpretation by the author of the students’ expressed strategies with and without insurance was somewhat subjective, but led to the following judgment of student responses which is summarized by Table 5. Some students were clearly able to articulate the optimal strategy for accumulating economic value when playing the ‘Out-of-Pocket’ scenario – Choose Care when  $\text{Cost of Care} + \text{Time Cost} < \text{Cost of Illness}$ . Responses ranged from 35% for the face-to-face undergraduate health care payment systems students to approximately 40% for both the distance education undergraduate health care payment systems students and the graduate health care systems and problems students taught at a distance. A smaller percentage (2.50% for the face-to-face undergraduate health care payment systems students, 8.11% for the distance education undergraduate health care payment systems students, and 13.33% of the distance education graduate health care systems students) professed confusion or having figured a strategy out only after completing game play. The remainder of the students for each class was only able to articulate a partial strategy.

The best strategy was less clear during the ‘Coinsurance and Deductible’ scenario. For those players able to articulate a distinct, rational strategy, two strategies emerged: 1) Choose Care when  $\text{Cost of Care} + \text{Time Cost} < \text{Cost of Illness}$  while monitoring the effect on cost-sharing once the deductible was consumed and 2) Consume the deductible as quickly as possible to gain the cost-sharing advantage of insurance. 15.00% of the face-to-face undergraduate health care payment systems students, 21.62% of the distance education undergraduate health care payment systems students, and 6.67% of the graduate health care systems and problems students taught at a distance clearly articulated the strategy Choose Care when  $\text{Cost of Care} + \text{Time Cost} < \text{Cost of Illness}$  while monitoring the effect on cost-sharing once the deductible was consumed. 20.00% of the face-to-face undergraduate health care payment systems students, 21.62% of the distance education undergraduate health care payment systems students, and 26.67% of the graduate health care systems and problems students taught at a distance chose to seek care and/or undergo a physical in order to consume the deductible for insurance to come into play. A smaller percentage (5.00% for the face-to-face undergraduate health care payment systems students, 2.70% for the distance education undergraduate health care payment systems students, and 6.67% of the graduate health care systems and problems students taught at a distance) professed confusion or having figured a strategy out only after completing game play. The remainder of the students for each class were only able to articulate a partial strategy.

One phenomenon of game play was highlighted by further discussion. Once the deductible was consumed, insurance coverage allowed care to be sought at 80% discount. Even so, in the absence of catastrophic loss not represented by the symptoms presented during game play, this insurance advantage was not sufficient to overcome the cost of the premiums. Noting that fact and asking a question about the value of insurance in those circumstances facilitated further discussion about risk aversion and the role of insurance in mitigating the risk of catastrophic loss.



**Table 5: Strategy**

<b>Class</b>	<b>Strategy</b>	<b>Out-of-Pocket</b>	<b>Copy and Deductible</b>
Face-to-face undergraduate health payment systems <sup>1</sup>	Choose care when cost of care + time cost < cost of illness	35.00% (14)	15.00% (6)
	Partial strategy articulated	62.50% (25)	60.00% (24)
	Consume deductible	–	20.00% (8)
	Incorrect strategy/no strategy	2.50% (1)	5.00% (2)
Distance education undergraduate health payment systems	Choose care when cost of care + time cost < cost of illness	40.54% (15)	21.62% (8)
	Partial strategy articulated	51.35% (19)	54.05% (20)
	Consume deductible	–	21.62% (8)
	Incorrect strategy/no strategy	8.11% (3)	2.70% (1)
Distance education graduate health care systems and problems <sup>2</sup>	Choose care when cost of care + time cost < cost of illness	40.00% (6)	6.67% (1)
	Partial strategy articulated	46.67% (7)	60.00% (9)
	Consume deductible	–	26.67% (4)
	Incorrect strategy/no strategy	13.33% (2)	6.67% (1)

The opportunity to choose to undergo an annual physical was an interesting nuance of game play. Students from all three classes chose to undergo at least one physical on average when paying out-of-pocket within the three years represented by game play. This choice was made even though the physical clearly reduced short-term cumulative economic value. Responses by some of the students indicated that they were willing to accept this loss because of the benefits perceived from having a physical. Although not every student choosing to receive a physical when paying out-of-pocket discussed their choice as a part of their strategy, of the 24 students from the three classes in total who explicitly stated that they had opted to receive at least one physical during the three-year period of game play, 18 commented that physicals had preventive value, were important, or were perceived to influence the outcome of the game. This suggests that some students regarded the physical as a kind of insurance. Although the probability of discovering imminent, catastrophic illness as the result of a physical is low, risk aversion provides an incentive to manage risk through the periodic screening offered by a physical even if payment is made out-of-pocket. If risk aversion contributes to the purchase of a physical out-of-pocket, moral hazard suggests that the availability of insurance should contribute to the decision to purchase additional physicals as was demonstrated by game play. Indeed, the students in all three classes chose to undergo a physical significantly more frequently when paying for insurance with a deductible and coinsurance. Although anticipated, this is not a trivial result. Another possible response illustrative of moral hazard was suggested by Helwege (1996, p. 60) while describing a policy exercise: 'The patient may engage in a suboptimal level of preventive care, knowing that an insurer will bear a significant portion of an acute health crisis.' In this exercise, some students responded that they made the choice to purchase additional physicals because of the benefits perceived from having a physical and others as a means of consuming the deductible more quickly to bring the benefits of insurance into play.

<sup>1</sup> One response not available for analysis

<sup>2</sup> Five responses not available for analysis

## 5. Conclusions

Playing the two scenarios of this moral hazard game engages students in deciding whether to seek care when presented with symptoms after considering the economic impact of their decisions. The concept of moral hazard is illustrated by game play rather than simply cited during lecture, and students are actually able to see during the after-action briefing how they or their peers tend to seek care more frequently and at greater cost when insured.

The use of online courseware in both face-to-face and distance classes produced additional advantages:

1. The courseware was familiar to both students and faculty.
2. Use of the online courseware facilitated a dynamic environment. Symptoms and associated costs were presented randomly at scheduled intervals (in this case, quarterly). When a previous version of the game was played as a static spreadsheet game, all of the symptoms and costs were presented at once. Even though players were supposed to make decisions to seek care iteratively, the ability to 'look ahead' to view upcoming symptoms allowed students to game their selections in the earlier version.
3. Functions inherent to the courseware required no specific programming skills by the instructor.
4. Administration of the game could be packaged effectively within the courseware. Preview materials to be read prior to game play, the game itself, and debriefing/after-action materials all could be packaged within the same folder.
5. Responses were conveniently recorded for retrieval and analysis. Although arranging the data so that Excel could perform the statistical computations after the response files were downloaded from the courseware was somewhat tedious, the procedure was still an improvement over the previous version of the game.

Finally, play of the game facilitated further classroom discussion about risk aversion and insurance theory.

### Author's note

The author thanks the editor and two anonymous referees for constructive feedback. This game is available to other instructors teaching with Blackboard®. Contact the author by email [kennedym@ecu.edu] or telephone [+1 (252) 744-6182] for assistance in importing the necessary files.

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## Author Biography

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