

ONLINE SCENARIO SIMULATION EXERCISES: BENEFITS FOR ADULT LEARNING IN SECURITY STUDIES

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Abstract

This research was conducted based on the premise that through scenario-based online simulation exercises tangible benefits in student learning can be achieved. Since it is understood that textbooks and lectures do not adequately capture the dynamic, time-sensitive, context-dependent, multi-disciplinary nature of emergency and crisis scenarios, this research attempted to assess the real benefit of online exercise simulation tools for criminal justice, emergency management, and security related studies at the bachelor's and master's levels. The study is based on 3 courses that used online (computerized) simulation-based exercises, 2 of them in undergraduate Criminal Justice program and 1 exercise offered in the graduate Homeland Security Management/Biosecurity and Biodefense program specialization at the University of Maryland University College (UMUC), the largest public university in the United States that provide distance and online education. A total of 95 (out of the total sample of 282) students responded to the survey. The majority of the students agreed that scenario simulation exercises helped them understand the material better, simulated real-world experience, helped in visualizing and conceptualizing, improved decision making skills, as well as communication and consensus gathering skills. Extensive correlation analyses were conducted with the quantitative data generated from this research. There are interesting findings that correlate the degree of satisfaction about individual features of the exercises and student demographics. The statistics generated through this research can lay a foundation for further detailed studies that assess the effectiveness of online scenario-based simulation tools.

Keywords

Adult education, Distance education, Online education, Simulation,
Scenario-based learning.

ONLINE SENARYO SİMÜLASYON ALIŞTIRMALARI: GÜVENLİK ÇALIŞMALARINDA ÖĞRENİM GÖREN YETİŞKİNLER İÇİN FAYDALAR

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Özet

Bu araştırma, senaryo bazlı online simülasyon alıştırmaları aracılığıyla öğrencinin öğrenmesinde maddi (somut) faydalar sağlanabileceği varsayımına dayalı olarak gerçekleştirilmiştir. Ders kitaplarının ve derslerin acil durum ve kriz senaryolarının birden çok akademik disiplini ilgilendiren, içeriğe bağımlı, zamana duyarlı, dinamik doğasını yeterli bir şekilde kapsamadığı anlaşıldığından; bu araştırma online alıştırmaya simülasyon araçlarının, lisans ve lisansüstü seviyelerinde güvenlik ile ilgili çalışmalara, acil durum yönetimine ve ceza yargılamasına yönelik gerçek faydasını değerlendirmeye çalışmıştır. Söz konusu çalışma, online (bilgisayarlı) simülasyon bazlı alıştırmaları kullanan 3 derse dayalı olup bunların 1'i uzaktan ve online eğitim sunan, Birleşik Devletler'in en büyük devlet üniversitesi olan University of Maryland University College'ta (UMUC) lisansüstü Ulusal Güvenlik Yönetimi/Biyo-emniyeti ve Biyo-savunma programı uzmanlığında, 2'si ise lisans düzeyinde Ceza Yargılama programında sunulmuştur. Uygulanan anketi toplam 95 öğrenci (toplam 282 örneklemden) cevaplamıştır. Öğrencilerin çoğunluğu senaryo simülasyon alıştırmalarının, malzemeleri daha iyi anlamalarına yardımcı olduğu, gerçek dünya deneyimini simule ettiği, görselleştirmeye ve kavramsallaştırmaya katkıda bulunduğu, iletişim ve fikir birliği sağlama becerilerinin yanı sıra karar verme becerilerini de geliştirdiği konusunda hemfikir olmuşlardır. Bu araştırmadan elde edilen sayısal veriler üzerinde kapsamlı korelasyon analizleri gerçekleştirilmiştir. Öğrenci demografileri ile alıştırmaların bireysel özelliklerine ilişkin memnuniyet derecesi arasında ilişki olduğunu gösteren ilginç bulgular elde edilmiştir. Bu araştırmadan elde edilen istatistikler ileride online senaryo bazlı simülasyon araçlarının etkinliğini değerlendirecek daha ayrıntılı çalışmalar için bir temel oluşturabilir.

Anahtar Kelimeler

Yetişkin eğitimi, Uzaktan eğitim, Online eğitim, Simülasyon, Senaryoya dayalı öğrenme.

INTRODUCTION

Today, many higher education institutions are faced with the challenge of effectively teaching the core concepts and underlying theories that constitute the backbone of Emergency Management, Criminal Justice, and other security related practical disciplines/professions. Some of the core concepts, particularly the response aspects to large scale crises and emergencies that threaten communities necessitate the use of a scenario-based teaching approach, most suitably web-based scenario simulation exercises. With the growing trend of the online delivery of these curricula, the use of computerized and online scenario simulation approaches are especially sought.

University of Maryland University College (UMUC) located in Maryland, United States of America, offers graduate and undergraduate level studies in these fields in mostly online (roughly 90% online, and 10% on-site) and face to face settings to the members of the military and busy working adults. UMUC as one of 11 degree-granting institutions in the University System of Maryland, is arguably the largest public university with online presence with close to 90,000 registered students at any given time.

In introducing new concepts especially in these challenging and continuously evolving fields, students are assigned a heavy reading load from textbooks as well as case studies and other material such as government policy documents. Comprehending these reading assignments represent an added challenge to the existing hurdles of the adult learners whose lives are busy with full-time jobs, family responsibilities, and military or job deployment issues. Understanding the link between the policies and their actual applications presents a challenge in and of itself through textbook reading assignments, lecture notes and class discussions.

Recent course evaluation surveys revealed the fact that there is a growing interest among these students in the potential use of computerized simulation tools to augment textbook reading assignments and virtual class discussions.

In emergency management profession, it is particularly important that students learn how to make the correct decisions under specific crisis situations by applying the learned theories into practice. In face to face, synchronous environments, crisis management situations are simulated through tabletop exercises where key players involved are present at the same time for at least a few hours. However, simulating a table top exercise in an asynchronous, online environment presents special challenges. These challenges are outside the scope of this paper.

The literature review conducted earlier by Renda-Tanalı and Abdul-Hamid (2011) revealed a variety of teaching experiments that utilize web-based scenario simulation exercises. For example, enhancing classroom learning

(online or face-to-face) with the use of multi-media technology (video, audio, web pages, and lately web 2.0 tools: blogs, wikis, social networking sites, podcasts, vodcasts, etc.) has been employed widely for training and education in social sciences (Agostinho et al., 2005; Seabury, 2005; Charsky et al., 2009) as well as physical or computational sciences (Tao et al., 2006; Limson, et al, 2007; Monahan et al., 2008; n.d. 2009; and Bojanova & Pang, 2010). One earlier example is Spinello and Fishbach's (2004) web-based scenario simulation developed for teaching public health courses to undergraduate students. Their online scenario simulation tool generated relatively favorable results in terms of contributing to student learning with challenges to overcome. Until a few years ago, UMUC used a similar but more advanced type of simulation in the Homeland Security Management graduate introductory course, named as San Luis Rey simulation exercise. The exercise involved the use of multiple web pages that included maps, location of critical infrastructure and other resources of a fictitious city and required students to employ their critical thinking skills in developing threat assessment and emergency response policies for the city. The results of the satisfaction survey seemed promising initially (Boubsil & Gayol, 2006), however the simulation exercise required extensive propping up by a teaching assistant. Later we received mixed reviews from students about the benefits of the tool. Due to the diminishing returns from the benefits of the use of San Luis Rey, the San Luis Rey exercise was ultimately discontinued.

Today, virtual worlds and intelligent agents make up the elements of the state-of-the-art real world simulation exercises. For example, Play2Train, a virtual world platform is used to replicate tabletop exercises. The United States Centers for Disease Control (CDC), Emory University, the University of Illinois at Chicago's Center for the Advancement of Distance Education (CADE), Seton Hall University, and Idaho State University are known to have used Play2Train (Hewitt et al, 2009). Play2Train employs Second Life software tool that involves avatars (intelligent agents) that mimic human behavior. Hewitt et al (2009) used Second Life resources as well as Play2Train in their Master of Healthcare Administration online program for allowing students enhance their discovery, critical thinking, and analytical skills. The results were promising. Although students enjoyed the tool, they had impediments with technology fluency and preparation time. These simulation tools reveal that role playing enhances student learning (Battersby, 2008; Oliver & Carr, 2009). Jones and Warren (2009) note that it takes too long to discover these tools and the benefits may not outweigh the time spent. Oliver and Carr (2009) also question the link between learning and playing computer games or computer game like simulations. Murphy and Gazi (2001) reported similar concerns much earlier.

This research builds on the findings of a longitudinal study, Best Online Instructional Practices, conducted by the Office of Evaluation and Assessment at UMUC (Lewis & Abdul-Hamid, 2006). According to Lewis and Abdul-

Hamid, in the area of technology utilization, structured systematic activities focusing on facilitating student learning are the most influential on student outcomes. Students tended to be more engaged in classes that used active learning tools such as simulations and learning modules. They were also more likely to succeed in comparison to other courses. Using role playing, simulations, or other activities to supplement lecture and discussions in learning was associated with about 17 percent increase in student success (Abdul-Hamid, 2005 & 2010).

Objectives of the Study

The objectives in this study were, (1) to determine the effectiveness of online scenario simulation tools on student learning and comprehension as related to the emergency management and associated fields; (2) to identify the strengths and weaknesses of those tools; (3) to compare those tools to traditional methods of teaching; (4) to uncover facts that relate to student demographics that this researcher did not previously know; and (5) to develop better tools through the findings of the study.

Due to time and resource restraints, this researcher decided to survey the existing tools used in asynchronous online learning environments in UMUC.

METHOD

This researcher searched first the existing programs in the areas of emergency management, criminal justice, and homeland security to see whether any computerized online scenario simulation tools were being used. This researcher identified 3 courses, 2 of which were offered as part of the undergraduate Criminal Justice program, and one in the Biosecurity and Biodefense/Homeland Security Management graduate specializations. This researcher then targeted all of the online sections of those courses offered in one particular semester. The students were surveyed via an online survey tool to assess their satisfaction with the simulation tool as well as their perception on how much the tools contributed to their learning. To augment the survey, this researcher also virtually visited each online classroom; collected statistics on the participation, presence, interaction, and student grade distributions, and conducted correlation studies among student satisfaction, actual performance, and demographics. The areas this researcher surveyed included students': 1) understanding the material, 2) improvement of skills in processing, testing, validating assumptions, 3) improvement in decision making skills, 4) getting closer to real-life experience, 5) connecting events and objects (or actions), 6) improvement of visualizing, conceptualizing, comprehending, 7) consensus gathering, 8) effective crisis communication, 9) effective use of resources, 10) effective emergency response to large scale crises, 11) student-to-student

interaction, and 12) student-to-faculty interaction. This researcher especially focused on the three components of the community of inquiry framework (COI) in relation to 1) cognitive presence, 2) social presence and 3) teaching presence (Garrison, 2007). The survey instrument included questions in the form of a statement covering each of the 12 areas (see above) that was similar to the following: “The tool helped understand the material better”. The students were then asked to rate their degree of agreement with each statement based on a 4-point Likert scale that consisted of 4- Strongly Agree, 3- Agree, 2- Disagree, and 1- Strongly Disagree. Note that a neutral point was not used in the scale. This researcher used Cronbach’s alpha in order to correctly group the questions and assure internal reliability of the survey instrument.

Assumptions

This researcher tested all 3 of the simulation tools used in 3 different courses, in terms of whether they helped students understand the material better, improve their decision making skills, and helped them get close to a real-life experience. Additionally, this researcher tested 2 of the 3 online scenario simulation tools used in the undergraduate Criminal Justice curriculum in terms of whether they helped students connect events and objects (or actions), as well as visualization, and conceptualization, and improvement of students’ skills in processing, testing, and validating assumptions. This researcher also tested the tool used in the graduate program against its usefulness for helping students learn consensus gathering, effective crisis communication, effective use of resources, as well as effective emergency response to large scale crises. In all cases, this researcher also looked at whether there was an increased student-to-student interaction and/or student-to-faculty interaction during the timeframe which the simulation activity was assigned which could be considered as proxies for the evidence of enhanced learning activity. This researcher also tested the assumption that the students who responded favorably to the areas also received better grades, and hence the tools contributed and/or facilitated learning (Renda-Tanali & Abdul-Hamid, 2011).

Simulation Tools Surveyed

Tool 1: “Crime Scene Simulation”, an individual activity was assigned to students during the second part of the semester as part of the introductory course named Introduction to Criminalistics and carried a weight of 20% of the overall course grade. This is a computer game-like simulation where students virtually move around a fictitious crime scene, examine objects, process evidence, place them in an evidence box, interview the witness, and record details in a journal. After all the evidence is collected, students enter into a virtual Crime Lab and request the appropriate tests for each evidence item collected, such as fingerprint analysis, forensic biology, toxicology, medico-legal

autopsy, and firearm examination. After all the tests are performed, a detailed “crime scene report” is generated. Students are graded based on the correctness of the evidence collected and the correctness of the tests. The crime lab yields no results if incorrect tests are requested.

Tool 2: “Cold Case Simulation”, again an individual activity, was assigned as a requirement for the undergraduate course named Medical and Legal Investigations of Death that teaches an intensive look at medical and legal investigations into causes of death. The assignment again carried a weight of 20% of the overall course grade. Again, through a semi computer game-like simulation, students examine past reports and evidence from the original investigation. Once they are familiar with the homicide case and the people involved, they proceed to interview select persons of interest. As the simulation progresses and students encounter new evidence, they are able to submit that evidence for various types of forensic testing. As students proceed with their investigation, they gather evidence, other documents such as test results, reports, and witness statements. These items are placed into their binder as they are created or discovered. The deliverable is an “arrest warrant report”, and the objective of the simulation is to gather enough evidence, secure an indictment from the district attorney, and solve the case.

Tool 3: “Biological Attack simulation” was assigned as a requirement for a graduate level Biosecurity and Bioterrorism course that teaches students a review of bioterrorism, biosecurity, and government biodefense strategy, including the history and science of biological agents in agriculture and society. This simulation carried 25% of the grade and was used in lieu of final exam. The goals were to describe the pathogenesis of the infectious agent, including its diagnosis, treatment and preventive strategies; to identify key players and their roles in public health emergency preparedness and response; to establish a response command structure following a public health bioterrorism crisis; demonstrate knowledge of laws, regulations, other vital components at federal and state level disaster response, demonstrate proficiency in identifying, allocating, and/or augmenting resources; and to apply crisis and consequence management skills with effective media communications. This was a multimedia scenario-based simulation exercise enhanced with intercept messages, audio-video clips and pictures to create a realistic experience. Each student was assigned a specific role in their group as a task force member in response to a message that asserted that a bioterrorist attack has occurred.

RESULTS AND FINDINGS

Due to the voluntary nature of the surveys, the response rate was around 35% concerning all three simulation exercises. In other words, a total of 95 students responded to the survey out of a population of 282. For the Crime Scene

Simulation, 51 students out of 145 students responded (35.2 %), for the Cold Case Simulation 26 out of 76 (34.2%), and for Bioattack Simulation 18 out of the 51 students who received surveys responded (35.3%).

Age and gender demographics of the participants. The undergraduate population that used Tools 1 and 2 had a majority of females (69% and 88% respectively). On the contrary, the graduate students consisted mostly of males (83%). As for the age distribution, the undergraduate students are younger in average than the graduate students.

This researcher conducted correlation analyses among the parameters using Pearson Correlation Coefficient method. Pearson's correlation coefficient between two variables is defined as the Covariance of the two variables divided by the product of their standard deviations. Equation 1 provides the Pearson Correlation formula and Table 2 shows the Pearson correlation ranges.

Equation 1. Pearson Correlation Coefficient formula

$$\rho_{X,Y} = \frac{E(XY) - E(X)E(Y)}{\sqrt{E(X^2) - (E(X))^2} \sqrt{E(Y^2) - (E(Y))^2}}$$

Table 1. Pearson correlation coefficient ranges

Correlation	Negative	Positive
None	-0.09 to 0.0	0.0 to 0.09
Small	-0.3 to -0.1	0.1 to 0.3
Medium	-0.5 to -0.3	0.3 to 0.5
Strong	-1.0 to -0.5	0.5 to 1.0

Comprehension

In all three cases, majority of the students agreed that the tool(s) helped their understanding of the material, gave them hands on experience, mirrored a real world experience, and improved their decision making skills. Table 2 shows the summary. This researcher also tested the correlation between the degrees of agreement of each attribute to each other, and found that students were generally consistent in their assessment of the benefits of the tool. For example, those students who agreed that the tool helped their understanding of the

material better also agreed that it gave them a hands-on experience, it mirrored real-life experience and improved their decision making skills in each simulation case, with slight variations in the degree of correlation. The Pearson correlation coefficient was measured mostly as medium (between 0.3 and 0.5) or high (0.5-1.0) among these attributes with the exception of the Bioattack simulation where understanding the material did not consistently correlate with the other attributes.

Table 2. Comparison of results on learning parameters among three simulations

	Crime Scene		Cold case		Bioattack	
	Agree	Inter-item correlation	Agree	Inter-item correlation	Agree	Inter-item correlation
Understanding material	84%	Strong $r > .5$	84%	Strong $r > .5$	100%	Strong to low
Hands-on experience	84%	Strong $r > .5$	88%	Strong $r > .5$	100%	Strong to medium
Mirroring real-life experience	84%	Strong $r > .5$	68%	Strong $r > .5$	89%	Strong to medium
Improving decision making skills	82%	Strong $r > .5$	75%	Strong $r > .5$	89%	Strong to medium

Again, as shown in Table 3, majority of the students who used Crime Scene Simulation and the Cold Case File Simulation agreed that the tool helped them (1) validate and test their assumptions; (2) make connections between events and objects; and (3) helped visualizing and conceptualizing things related to crime scene and/or a murder case. Those statements were not assessed in the Bioattack case since they were not relevant. As Table 3 indicates, an overwhelming majority of the students who responded to the Bioattack survey agreed that the tool helped them (1) understand effective emergency response; (2) improve their consensus gathering skills; (3) learn effective use of resources in a large scale biological attack situation; and (4) improve their effective crisis communication skills. These were not tested for the previous two cases since the nature of the assignment was not related. The correlation coefficient among the parameters ranged from mostly Strong (0.5-1.0) to Medium (0.3-0.5) and to Low (0.1-0.3). The specifics are shown in Table 3.

Table 3. Comparison of results among each tool on content-related competencies

	Crime Scene		Cold case		Bioattack	
	Agree	Correlation	Agree	Correlation	Agree	Correlation
Validating and testing assumptions	80%	Strong $r > .5$	75%	Strong $r > .5$	N/A	N/A
Making connections between events and objects	80%	Strong $r > .5$	84%	Strong $r > .5$	N/A	N/A
Helps visualizing, conceptualizing	88%	Strong $r > .5$	92%	Strong $r > .5$	N/A	N/A
Understanding effective emergency response	N/A	N/A	N/A	N/A	100%	Strong $r > .5$ (consensus, resources, eff. Crisis comm.), Medium (understanding, hands-on, real-life, decision making)
Improve consensus gathering skills	N/A	N/A	N/A	N/A	94%	Strong (decision making, eff. EM response, resources, eff. Crisis comm.) Medium (hands-on, real-life), Low (understanding)
Learn effective use of resources in EM response	N/A	N/A	N/A	N/A	100%	Strong (effective EM response, consensus, effective Crisis comm.) Medium (understanding, hands-on, real-life, decision making)
Improve effective crisis communication skills	N/A	N/A	N/A	N/A	94%	Strong

Interaction

Although this researcher assumed that interaction (both between student and the faculty and student-to-student) helped understanding the material better, this researcher received mixed results from the surveys. Students rated the simulation tools as a contributor to student-to-student interaction as low in the first two tools (37% and 40% agreed), and as overwhelmingly high (94% agreed) in the third tool. This result was expected since the first two tools were individual assignments and the third one was a group effort. On the other hand, this researcher had mixed results on the assessment of student-to-faculty engagement. 76% of the students stated that the Crime Scene Simulation exercise increased their interaction with the instructor, whereas only 44% of those who used the Cold Case and 50% of those who used Bioattack simulations agreed. The differences in results could be attributable to several factors. Was the increased interaction about asking the instructor on how to use the tool or because students had stimulated thoughts that prompted them to ask more questions to the instructor to enhance their understanding of the content? To find out, this researcher had a second but similar question which was formulated as “The tool gave me ideas to interact with the instructor”. From the findings, the 78%, 71%, and 71% agreement rates indicate that more students found the tools helpful in terms of increased interaction with the instructor than those did not. The correlation analysis between the learning parameters (discussed above) and the interaction yielded a range of results from Low to Medium in the Crime Scene simulation, and mostly Strong to Medium in both the Cold Case simulation and the Bioattack simulation.

It is important to note that this researcher did not find any meaningful correlation between the actual grades and the responses at the individual classroom level for any of the three exercises.

However, when this researcher correlated the average course grade distributions for each section with the student responses, for the Crime Scene simulation and for the Cold Case file simulation it was possible to uncover Medium to Strong correlation between the percentage of “A” grades awarded by the instructors and the percentage of students who agreed that the tools helped their learning. This researcher did not find any correlation between the grade distribution and student satisfaction rating for the Bioattack simulation.

Impediments

This researcher tried to uncover factors that impeded the effective use of the simulation tools as well, thus this researcher asked the students to rate statements such as “Technology worked at all times”, and asked them to provide the amount of time they spent working on the exercise. Although since these were all required courses, this researcher did not uncover any major

differences in user familiarity. This researcher observed that majority of the students had no technical problems although there were reported bugs in some cases. Especially there were comments regarding the lack of “saving” feature or not being able to issue an “arrest warrant report” in the Cold Case File simulation unless all of the steps were done correctly. One interesting fact this researcher uncovered from two of the exercises was that there was a negative correlation between the amount of time spent working on the exercise and better learning. This researcher found that there is negative correlation between the time spent and the students’ confirming that the tool gave a hands-on experience and/or real-life experience, and/or helped testing assumptions and making connections.

Demographic effects

Since the first two exercises were offered in the undergraduate curriculum, the average age of the students were lower than the average age of the graduate students who were assigned the Bioattack tool. Interestingly, this researcher uncovered a Strong negative correlation between the time spent and age in the Cold Case Exercise. Also, again interestingly this researcher found Low to Medium negative correlation between the degrees of satisfaction in some of the learning parameters and age in all three exercises. It appears, as the respondent’s age increases, the degree of utility from the simulation exercise decreases.

This researcher did not study the gender issues in this research.

CONCLUSION AND DISCUSSION

The results give strong positive as to whether the simulation tools described above help student comprehension and, provide near real-life and/or hands-on experience. At least in two of the simulation tools this researcher studied, there is a correlation between student satisfaction and grades.

However, the jury is out in terms of enhanced student-to-student and/or student-to-faculty interaction. The findings neither support nor deny that thesis.

None of the tools that this researcher looked at had any major technological impediments. All were well-tested against software bugs and were reportedly bug free. Unsurprisingly, there was a negative correlation between reporting technical hurdles with the software simulation and the utility of the tool.

Another factor that affected the success of the simulation tool use was age. The findings support the thesis that as the age increases, the degree of satisfaction or utility from online scenario simulation exercises diminishes. Age plays an

important role in designing the content for the student audience. This issue merits further attention in future studies.

It is important to note that the tools that were the subject of this research were rudimentary in nature, short of many state-of-the-art computer gamelike features such as multiplicity of scenarios, actors, and random discoveries. For example, the crime scene simulation had one witness to interview, not multiple witnesses (which is usually the case in real life cases). There were only a few questions to choose from for the witness to answer, and the right question would lead the user to advance to the next step and so on. Ideally a more stimulating learning environment can be created with the use of multiple witnesses and multiple interview question options. Moreover, the tools should allow room for changing/alternating between multiple scenarios. The more sophisticated (game like) features would possibly make the tool closer to real life. That should not mean however that the more money spent means a better tool; each additional dollar spent should contribute to the richness of the tool in terms of enhancing learning. Expanded studies may look at a possible link between the dollar amount spent for development and the student success outcome.

In future studies, similar assessments can be made to cover other institutions and other disciplines. It is important to understand the audience demographics, their background and interests as well as their abilities when designing and using online scenario simulation tools. As the world moves fast towards a virtual digital environment, these and similar tools will become more popular. Researchers and educators not just in the emergency management related disciplines but from other practical disciplines should continue to look for ways of using and improving these computerized scenario simulation tools, and sharing their success stories. As the younger generation spends a lot of time on social media (e.g. Twitter, Facebook, Youtube, Flickr), these tools can be enhanced by integrating social media use into the simulation but with a strong emphasis on the learning aspects.

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GENİŞ ÖZET

University of Maryland University College'ta (UMUC) lisans ve lisansüstü derslerin verilmesinde online (bilgisayarlı) simülasyon araçları kullanılmaktadır. Özellikle Ceza Yargılama, Acil Durum Yönetimi, ve Halk Güvenliği derslerinde bu araçlardan faydalanılmaktadır. Bu araştırmada kullanılan anket sonuçlarının da belirttiği gibi, öğrenime sağladığı somut faydalardan dolayı bu araçlardan faydalanmaya ve mümkün olduğunca daha fazla sayıda derste kullanılmasına gerek vardır. Öğrenci ders değerlendirmeleri ve öğretim elemanlarının öğretim deneyimleri UMUC'ta bahsi geçen dallarda şu sonuçlara varmıştır: (1) öğrenciler gerçek dünya deneyimini simüle eden ve gerçek olaylarla uğraşmış gibi düşündüren dinamik ve pratik alıştırmalar yapmak istemektedirler; (2) öğrencilerin konuları daha iyi anlamasını sağlamak için ders kitabı okumak ve sınıfta yapılan tartışmalara ilaveten daha başka uyarıcı araçlara ihtiyaç vardır; (3) kriz, acil durum veya güvenlik yönetimini ilgilendiren konular zamana karşı hassas ve belirsizlik içerdiği için öğrenciler kriz durumlarında sağlıklı ve doğru kararlar verebilme yeterliğini mümkün olduğunca aktif bir rol alarak kazanmak istemektedirler; (4) öğrenciler kriz, acil durum ya da güvenlik yönetimini ilgilendiren olaylarda verilebilecek hangi kararın doğru ya da yanlış olduğunu ve bunların sebeplerini bilmek istemektedirler ve verecekleri bu kararların yol açtığı sonuçları senaryo simülasyonları sırasında aktif olarak gözlemlemek istemektedirler; (5) simülasyon içermeyen örnek çalışmalar geriye dönük olduğu için ve içerdikleri olayların sonuçlarının sürprize yer bırakmadan önceden biliniyor olması, öğrencilerin yeterince ilgisini çekmemektedir.

Ders kitaplarının ve derslerin acil durum ve kriz senaryolarının birden çok akademik disiplini ilgilendiren, içeriğe bağımlı, zamana duyarlı, dinamik doğasını yeterli bir şekilde kapsamadığı anlaşıldığından, bu araştırma online alıştırmalar simülasyon araçlarının, lisans ve lisansüstü seviyelerinde güvenlik ile ilgili çalışmalara, acil durum yönetimine ve ceza yargılamasına yönelik gerçek faydasını değerlendirmeye çalışmıştır. Zaman ve kaynak sınırları yüzünden, bu araştırma halihazırda simülasyonların kullanıldığı mevcut UMUC derslerine odaklanmıştır. Başka üniversitelerde kullanılan simülasyon araçları değerlendirmeye alınmamıştır. Bu araştırma, senaryo bazlı online simülasyon alıştırmaları aracılığıyla öğrencinin öğrenmesinde maddi (somut) faydalar sağlanabileceği varsayımına dayalı olarak gerçekleştirilmiştir. Söz konusu çalışma, online (bilgisayarlı) simülasyon bazlı alıştırmaları kullanan üç derse dayalı olup bunların 1'i, UMUC'de lisansüstü Ulusal Güvenlik Yönetimi/Biyogüvenlik ve Biyo-savunma programı uzmanlığında, 2'si ise lisans Ceza Yargılama programında sunulmuştur. Toplam 95 öğrenci anketi cevaplamıştır.

Öğrencilerin çoğunluğu senaryo simülasyon alıştırmalarının, malzemeleri daha iyi anlamalarına yardımcı olduğu, gerçek dünya deneyimini simüle ettiği,

görselleştirmeye ve kavramsallaştırmaya katkıda bulunduğu, iletişim ve fikir birliği sağlama becerilerinin yanı sıra karar verme becerilerini de geliştirdiği konusunda hemfikir olmuşlardır. Bu araştırmadan elde edilen sayısal verilerle kapsamlı korelasyon analizleri gerçekleştirilmiştir. Öğrenci demografileri ile alıştırmaların bireysel özelliklerine ilişkin memnuniyet derecesi arasında ilişki kuran ilginç bulgular mevcuttur. Örneğin, öğrencilerin genelde bahsi geçen simülasyon araçlarının yararları hakkında birbiriyle tutarlı değerlendirmeler yaptıkları saptanmıştır. Aynı şekilde, simülasyon aracının öğrenmelerine yardım ettiğini savunan öğrencilerin çoğu aynı araçların onlara gerçek deneyimi yansıtan pratikler verdiği ve karar verme becerilerini ilerlettiğini de ifade etmişlerdir. Bu bulgularda farklı simülasyon araçlarının yararının ölçülmesine dair çok az değişen derecelerde ama pozitif korelasyon gözlemlenmiştir. Yukarıda bahsi geçen simülasyon araçlarının öğrencilerin kavrama yeteneklerinin artması ile gerçek yaşama yakın deneyim elde etmeleri arasında çok güçlü bir korelasyon saptanmıştır. En az iki simülasyon aracında öğrencilerin memnuniyet derecesi ve aldıkları notlar arasında pozitif korelasyon bulunmuştur. Ancak, bu araçların öğrenciler arası ve öğrenci-öğretmen arası etkileşimi artırdığına dair belirgin bir korelasyon bulunamamıştır. Bulgular bu tezi ne desteklemekte, ne de aksini göstermektedir.

Not edilmesi gereken bir diğer husus ise araştırmacının incelediği bu araçlardan hiçbirinde teknik problem bulunmamaktadır. Her biri sürümden önce yazılım hatalarına karşı test edilmiş ve bulunan hataların elimine edildiği önceden rapor edilmiştir, ancak ufak tefek bazı problemlerin mevcut olduğu sonradan tespit edilmiştir. Bunların bazısı internet bağlantısının problemlili olup olmamasına da bağlıdır. Araştırma sonuçlarından elde edilen ve hiç de şaşırtıcı olmayan bir bulgu ise, teknik problem yaşadığını belirtme ile simülasyon araçlarını faydalı bulma arasında ters korelasyon olmasıdır.

Simülasyon araçlarının başarısını etkileyen bir diğer faktör ise yaş olarak belirlenmiştir. Bulgular, öğrencilerin yaşları arttıkça bu simülasyon alıştırmalarından elde edilen memnuniyet ya da fayda oranının azaldığını göstermekte; bir başka deyişle ikisi arasında negatif korelasyon göstermektedir. Bu bakımdan, içerik düzenlemede öğrenci yaş düzeyinin göz önüne alınması önemli bir faktör niteliği taşımaktadır. İleriki çalışmalarda bu konuya daha çok dikkat edilmesi önerilmektedir. Bu çalışmadan elde edilen bulgular ileriki araştırmalarda daha büyük ölçeklerde test edilmeyi gerektirmektedir. Bu araştırmadan elde edilen istatistikler online senaryo bazlı simülasyon araçlarının yararlarına dair ileride yapılacak daha ayrıntılı çalışmalara bir temel teşkil edebilir. Bu araştırmanın konusu olan araçlar genelde düşük bütçelidir ve tam gelişmemiştir. Daha yeni teknoloji ürünü bilgisayar oyun teknolojileri kullanarak tasarımılanmış simülasyonlu eğitim araçları ile öğrenmeyi pekiştirici daha verimli sonuçlar alınabilir.

YAZAR HAKKINDA

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