Proceedings of the 2019 AIS SIGED
International Conference on Information
Systems Education and Research

SIGED: IAIM Conference

12-31-2019

UNDERSTANDING STUDENT ENGAGEMENT AND LEARNING OUTCOMES: THE ROLE OF LEARNING STYLES

Darren Nicholson
Marketing and Business Information Systems Department, Rohrer College of Business, Rowan University

Jennifer Nicholson
Marketing and Business Information Systems Department, Rohrer College of Business, Rowan University

Yide Shen
Marketing and Business Information Systems Department, Rohrer College of Business, Rowan University, shen@rowan.edu

Pingping Song
School of Business, Georgia Gwinnett College

Research in Progress

UNDERSTANDING STUDENT ENGAGEMENT AND LEARNING OUTCOMES: THE ROLE OF LEARNING STYLES

Darren Nicholson (equal contribution; authors ordered alphabetically)
Marketing and Business Information Systems Department
Rohrer College of Business
Rowan University

Jennifer Nicholson
Marketing and Business Information Systems Department
Rohrer College of Business
Rowan University

Yide Shen
Marketing and Business Information Systems Department
Rohrer College of Business
Rowan University
shen@rowan.edu

Pingping Song
School of Business
Georgia Gwinnett College

Abstract:

Despite extensive research on the influence of student engagement in the classroom on student learning outcomes, few studies have examined student learning styles and their engagement in learning activities. In this research-in-progress paper, we propose a research model to examine whether student engagement during role-play exercises will lead to better learning and satisfaction, and the role learning style plays in influencing engagement. We conducted a survey study to evaluate our research model. Preliminary results show partial support for our research model. Our research will make contributions to the theoretical understanding of the relationships between engagement, learning styles and learning outcomes. Our study will also provide practical guidance for instructors to design instructional activities that accommodate for individual learning style differences.

Keywords: Engagement, learning style, learning outcomes, role-play

I. Introduction

Student engagement in the classroom has been extensively studied in the literature. Research has found that engagement plays an important role in learning [Carini et al., 2006; Kearsley and Shneiderman, 1998; Zhao and Kuh, 2004]. Increasing evidence has shown that engaging lectures can decrease student distraction during lectures, increase student perceived effectiveness of lectures and student confidence with lecture material, as well as improve short-term academic performance and long-term information retention [Miller et al., 2013; Steinert and Snell, 1999; Wilke, 2003].

Although the influence of engagement on student learning outcomes has been extensively studied in the literature, research that examines learning styles and engagement is lacking. Learning styles describe people's preferred ways of learning and individuals with different learning styles interact with stimuli in the learning context differently [Kolb, 1976a; Kolb, 1984b]. Literature has suggested that learning styles have a significant impact on learning performance and learners' satisfaction [Bostrom et al., 1990; Chou and Wang, 2000; Eom et al., 2006; Moores et al., 2004]. However, there is limited research on how learning styles impact student engagement in instructional activities and how learning styles influence the relationship between engagement and learning outcomes. The purpose of the current research is to fill this research gap.

To explore the effects of engagement on student learning outcomes, we use a class setting where role-play, an active learning technique [Freeman, 2003; Kerr et al., 2003], is used to stimulate student engagement. In this research, we examine whether student engagement during role-play exercises will lead to better learning outcomes, and the role learning style plays in influencing engagement.

The remainder of this research-in-progress paper is organized as follows: first, we review the literature on engagement and learning styles and develop research hypotheses; second, we describe the research methodology and present preliminary results; and lastly, we discuss the potential contributions of this study.

II. Literature and Hypotheses Development

Engagement

Many studies have found various benefits of student engagement in the classroom, including a positive impact on academic performance and information retention, student confidence with the material, perceived effectiveness of lectures, and a decrease in student distractions during lectures [Dweck, 1986; Miller et al., 2013; Steinert and Snell, 1999; Wilke, 2003]. In our study, we follow Chapman [2003, p. 1] and use engagement to refer to learning task engagement, which encompasses "students' cognitive investment, active participation, and emotional engagement with specific learning tasks".

While there are several methods that can be used to increase student engagement in the classroom, active learning has recently gained a lot of attention in the field of education [Miller and Metz, 2014]. Active learning is concerned with motivating students to engage more meaningfully in both their individual study and class discussion [Herrmann, 2013], rather than just focusing on taking notes. The level of engagement has been an important aspect for the comprehensive assessment of the effectiveness of active learning [Wigging et al., 2017]. Studies have found that higher levels of student engagement through active learning may encourage a student to accomplish higher-order objectives such as analysis, synthesis, and evaluation [Bonwell and Eison, 1991].

Researchers also found that students do not always prefer an engaging lecture. In certain settings, some students may prefer the traditional lecture [e.g., Huang and Carroll, 1997; Miller et al., 2013]. This suggests that the effectiveness of student engagement can vary across settings and faculty need to consider the setting when choosing pedagogy methods. Our study uses role-play as the setting to explore the impact of student engagement on learning outcomes.

Role-play is a type of experiential learning [Lewis and Williams, 1994] that can make learning tedious topics more enjoyable [Reid 1985] and stimulate active learning [Freeman, 2003; Kerr et al., 2003]. Role-play allows participants to act out a role in a specific situation and immerse themselves in interactions that mimic what they might experience in the real world [Feinstein et al., 2002]. This allows participants to become more involved [Broadwell and Broadwell, 1996], as compared with the traditional instructional method via lectures and text-based exercises. Thus, we propose the following hypotheses:

Hypothesis 1:   Student engagement in role-play is positively related with student learning.

Hypothesis 2:   Student engagement in role-play is positively related with student satisfaction with the learning experience.

Learning Style

Researchers have been interested in finding the underlying motivations driving engagement and exploring factors or methods that can enhance student engagement [e.g., Dixson, 2010; Lindt and Miller, 2018; Marx et al., 2016]. While the literature has extensive discussion on the impact of

learning styles on student learning [e.g., Ashraf et al., 2013; Nicholson et al., 2007], there is very little research on engagement that incorporates learning styles.

Learning style describes "the attitudes and behavior which determine an individual's preferred way of learning" [Honey and Mumford, 1992]. Informed by the growing literature that shows little evidence for learning styles as a valid predictor for academic learning performance [e.g., Knoll et al., 2017; Pashler et al., 2009; Rogowsky et al. 2015], in the current study, we are not proposing that learning styles will have a direct impact on student performance and satisfaction. Instead, we are interested in examining the role learning styles play in influencing student engagement in role-play activities, which in turn affects learning outcomes. In his experiential learning theory, Kolb [1984b] proposed a Learning Style Inventory model in which there are four stages to the learning cycle: Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC) and Active Experimentation (AE). Using the same framework, Honey and Mumford [1992] suggested that people may have one of four preferred learning styles: Activists (learn by doing and are always looking for an activity), reflectors (do a thorough collection and analysis of data before reaching a conclusion), theorists (emphasize logic and integrate observations into theories), and pragmatists (are keen on experimenting and need to put the learning into practice). We follow the typology of learning styles by Honey & Mumford [1992] in our study.

Activists like to learn by doing. They are keen on participating and learn best when working with others in problem solving, games, and role-play exercises. They always look for opportunities to be involved in activities. Reflectors are thoughtful people, who learn by observing and thinking about what happened. They like to stand back, collect data and observe from different perspectives. They prefer to be given an opportunity to review what has happened and take time to think thoroughly before coming to a conclusion. Pragmatists are practical people and learn best when they see an obvious link between the topic and a current need. Pragmatists also love problem solving. They look for new ideas that can solve the problem at hand. Being keen on experimenting, they are eager to try out various ideas and techniques and receive feedback from an expert.

In this research, we use group role-play exercises where students take on the roles of employees from different functional areas and coordinate three cross-functional business processes. This setting gives students the opportunity to work with others on hands-on tasks, discuss problems and look for solutions. Students also have the chance to observe how the cross-functional business processes are carried out from multiple functional areas' perspectives. The activities involved in the role-play are practical problems related to coordinating common, fundamental business processes across multiple functional areas. Role-play provides a new way for students to find solutions for these practical problems. Due to the nature of the group role-play exercises, we expect that individual learners with a stronger preference for activists, reflectors and pragmatists learning styles will be more engaged in role-play exercises.

> Hypothesis 3: Student preference for the activist learning style is positively related with student engagement in role-play.

> Hypothesis 4: Student preference for the reflector learning style is positively related with student engagement in role-play.

> Hypothesis 5: Student preference for the pragmatist learning style is positively related with student engagement in role-play.

Theorists like to understand the theory behind actions. They emphasize logic and conduct analysis and synthesis. They learn best when an activity is backed up by concepts that form a model, theory or system. Since the group role-play exercises involve activities about coordinating cross-functional business processes that are more practical than theoretical, we expect that individual learner preference for theorists learning style will have no significant impact on engagement.

> Hypothesis 6: Student preference for the theorist learning style has no significant impact on student engagement in role-play.
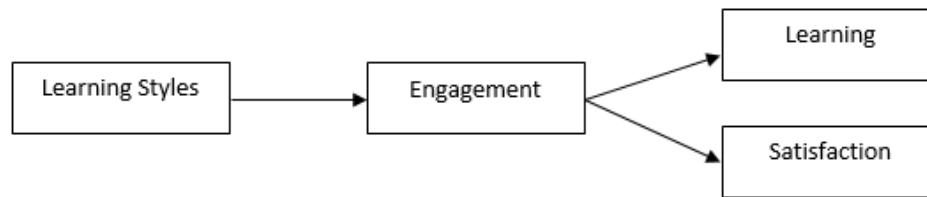
Figure 1 shows our research model.

Figure 1: Research Model

III. Methodology

Research Context

A survey study was conducted to evaluate our research model. Data was collected from students in three sections of an introductory MIS course in a northeastern US university. The course is a business core course that all business majors are required to take. As a major component of the course, we use a textbook titled "Essentials of Business Processes and Information Systems" (Magal and Word, 2009) to teach a five-week module on the topic of using ERP systems to support business processes.

Three role-play exercises are used in the five-week module to actively engage students in learning about business processes, especially the cross-functional nature of business processes (for a detailed description of the role-play exercises, please refer to [Shen et. Al, 2015]). Each role-play exercise focuses on one of the three generic business processes – procurement, fulfillment, and production – and how the steps in a process would be carried out in a paper-based environment. In each role-play exercise, students form groups of four to five people. We provide each group a packet which contains the key documents that are generated from completing the different steps in the process, as well as a list of questions that students are required to complete as part of the exercise.

Within a group, each student takes on the role of either an employee in a fictitious skateboard company or an external partner (i.e., customer or vendor). Using the textbook and documents provided in the packet, students work together to answer the list of questions while walking through the steps in the business process. Working within their groups, students discover how challenging it is to coordinate with various functional areas and external partners in completing the steps in the business process without the support of an ERP system.

The role-play exercises provide various ways for students who prefer different learning styles to learn, such as learning by doing (activists), problem solving and experimenting (pragmatists), and observing and thinking (reflectors and theorists). This course setting thus gives us a good opportunity to examine the proposed research model. We administered a pre-activity questionnaire before the first role-play exercise and a post-activity questionnaire right after students finish the last role-play exercise. The pre-activity questionnaire contains the instrument to determine student preferred learning style and the post-activity questionnaire contains measures for other constructs in our research model.

Questionnaire Development

An extensive literature review was conducted to identify measurement scales for all constructs. Whenever possible, we adapted validated measures from previous studies for this research.

Learning style. To determine student preferred learning style, we used Honey and Mumford's [1992] Learning Styles Questionnaire (LSQ) instrument, which contains 80 statements, that is, 20 statements for each of the four learning styles (i.e., activist, reflector, theorist and pragmatist). For the list of 80 statements, the respondents are asked to place a tick next to a statement if they agree more than they disagree with it.

Engagement. To measure student engagement during role-play exercises, we adapted Wiggins et al.'s [2017] 16-item instrument called Assessing Student Perspective of Engagement in Class Tool (ASPECT). As we focus on students' involvement in the role-play activity, we adopted two out of the three dimensions Wiggins et al. [2017] used, value of activity for learning (VA, Question 1-9) and personal effort put into the activity (PE, Question 10-12). We did not use the third dimension as it addresses student perceived instructor effort put into the activity and we plan to examine it for future research. Students are asked to rate the extent to which they agree or disagree with each of sixteen statements, on a scale ranging from 1 to 7, where 1 represents a strong level of disagreement and 7 represents a strong level of agreement.

Learning. We measured student perceived learning about the three key business processes and the role of ERP systems in supporting those business processes. To measure perceived learning, we adapted ten questions from Seethamraju [2007]. Students are asked to give a self-assessment of their knowledge before and after learning about the three key business processes. The self-assessment scale ranges from 1 to 7, where 1 represents a very low level of knowledge and 7 represents a very high level of knowledge. We calculated the difference between self-assessment scores after and before learning the three business processes and participating in the role-play exercises. The difference between both scores is used to measure perceived learning.

Satisfaction. We used two instruments to measure student satisfaction. We adapted eight questions from Kerr [2003] and Costain and McKenna [2011] asking students to rate their satisfaction with the role-play activity itself (SA1). In addition, students are asked five questions on how they would rate their satisfaction with using the role-play exercises to learn about business processes (SA2). Students are asked to rate the extent to which they agree or disagree with each of the 13 statements on a scale ranging from 1 to 7, where 1 represents a strong level of disagreement and 7 represents a strong level of agreement.

IV. Data Analysis and Preliminary Results

Participants, Measurement Reliability and Descriptive Statistics

Participants in this research study were 95 students who were enrolled in three sections of an introductory undergraduate MIS course at a public university in the United States. Three participants were removed from the sample due to incomplete data, leaving a final sample size of 92.

We calculated Cronbach's alpha values for all multi-item measures to check measurement reliability. For the two engagement dimensions, value of activity for learning (VA) and personal effort put into the activity (PE), the Cronbach's alpha values are 0.92 and 0.86, respectively. For learning, the scale's Cronbach's alpha value is 0.96. For the two satisfaction measures, satisfaction with the role-play activity itself (SA1) and satisfaction with using the role-play exercises to learn about business processes (SA2), the Cronbach's alpha values are 0.94 and 0.91, respectively. These values all exceed the 0.70 threshold (Nunnally 1978), which show high reliability for our measures.

All the questions on the survey are on a 7-point Likert scale, except for the learning style questions. For learning styles, the total score on the 20 statements for each learning style is calculated to measure the participant's preference for each of the four learning styles. Table 1 shows the descriptive statistics and correlations.

Table 1. Descriptive Statistics and Correlations

	Mean	SD	Activist	Reflector	Theorist	Pragmatist	VA	PE	Learning	SA1	SA2
Activist	8.22	3.56	1								
Reflector	12.33	3.18	-0.116	1							
Theorist	10.27	3.37	-0.106	0.365*	1						
Pragmatist	10.78	3.09	0.174	0.208*	0.549*	1					
VA	5.07	1.10	0.194*	0.115	-0.023	0.055	1				
PE	5.39	1.14	-0.035	0.236*	-0.003	0.029	0.6853	1			
Learning	3.47	1.19	0.017	-0.024	-0.136	-0.231*	0.320*	0.243*	1		
SA1	5.18	1.21	0.127	0.2146*	0.097	0.045	0.884*	0.706*	0.321*	1	
SA2	5.27	1.17	0.135	0.114	-0.047	-0.102	0.769*	0.610*	0.303*	.794*	1

* Significant at 0.05
VA: Engagement – value of activity
PE: Engagement – personal effort
SA1: Satisfaction with the role-play activity itself
SA2: Satisfaction with using the role-play activity to learn about business processes

Hypotheses Testing

Table 2 reports the regression results of the two engagement aspects on learning and on satisfaction. Of the two engagement aspects, value of activity (VA) and personal effort (PE), only VA is found significant on learning, but not PE. Thus, hypothesis 1 is partially supported.

Hypothesis 2 also received partial support. While both engagement aspects (VA and PE) are significantly positively related to satisfaction with the role-play activity itself (SA1), only value of activity (VA) has a significant positive effect on satisfaction with using role-play to learn about business processes (SA2). This may be because regardless of personal effort, all students are satisfied with using role-play to cover this topic. Since the value of activity aspect of engagement positively impacts both satisfaction measures, it has a profound impact on learning as well as satisfaction.

Table 2. Regression Results: Student Engagement and Learning Performance

	Learning	Satisfaction 1	Satisfaction 2
Engagement (VA)	0.313 *	0.832**	0.706**
Engagement (PE)	0.047	0.202**	0.161
R-squared	0.103	0.800	0.605

* Significant at $p<0.1$; ** Significant at $p< 0.05$

Table 3 through Table 5 show the regression results of learning style preference on the two aspects of engagement. As shown in Table 3, stronger preference for activist learning style are found

related to higher engagement value, suggesting that learners with activist learning style tend to appreciate the experiential learning activity of role-play. However, no significance is found on their personal effort, likely because activist learners keep being active in participation. Hypothesis 3 thus received partial support.

Table 3. Regression Results: Learning Style Preference for Activist and Engagement

Learning Style	Engagement Value of Activity	Engagement Personal Effort
Activist	0.060*	-0.011
R-squared	0.038	0.001

* Significant at p<0.1; ** Significant at p< 0.05

Hypothesis 4 is also partially supported as preference for reflector learning style is found positively related to the personal effort aspect of engagement, suggesting that reflectors spend more effort on the role-play activities. However, no significance was found on the value of activity aspect.

Table 4. Regression Results: Learning Style Preference for Reflector and Engagement

Learning Style	Engagement Value of Activity	Engagement Personal Effort
Reflector	0.040	0.085**
R-squared	0.013	0.056

* Significant at p<0.1; ** Significant at p< 0.05

No significance was found between preference for pragmatist and engagement, thus Hypothesis 5 is not supported. This could be that while students with the pragmatist learning style like to work with job-related problems, some of them may not consider the role-play activity as really related to real world challenges and thus do not see the relevance. Therefore they do not value the activity or spend much effort on it.

Table 5. Regression Results: Learning Style Preference for Pragmatist and Engagement

Learning Style	Engagement Value of Activity	Engagement Personal Effort
Pragmatist	0.019	0.011
R-squared	0.003	0.001

* Significant at p<0.1; ** Significant at p< 0.05

The results are consistent with Hypothesis 6, showing no significant relationship between preference for theorist learning style and engagement value or personal effects, suggesting that a stronger preference for theorist does not necessarily lead to higher levels of engagement.

Table 6. Regression Results: Learning Style Preference for Theorist and Engagement

Learning Style	Engagement Value of Activity	Engagement Personal Effort
Theorist	-0.007	-0.001
R-squared	0.001	0.000

* Significant at p<0.1; ** Significant at p< 0.05

V.   Discussion and Conclusion

In this research-in-progress paper, we presented a research model to examine whether student engagement during role-play exercises will lead to better learning and satisfaction, and the role learning style plays in influencing engagement. Preliminary results reinforces prior research that found engagement as a multifaceted concept [Christenson et al., 2012; Reeve and Lee, 2014]. The effects of the different aspects of engagement, i.e., learning activity's value for learning and personal effort put into the activity, on student learning and satisfaction varies. Learning styles also affect the different aspects of engagement differently. We plan to conduct more thorough analysis of the data when we continue work on this paper, possibly looking into the moderating effects of learning styles on the relationship between engagement and learning outcomes.

As is the case with all research, our study has some limitations. The research model is evaluated in this study using simple regression analysis only. We plan to use other methods such as SEM, PLS or path analysis to test our research model when we develop the manuscript further. Another limitation is that the observed effect sizes for the learning styles are relatively small. We plan to further examine the explanations drawing from the literature as well as exploring the implications in the next steps.

We believe our study will make several contributions. First, our research will make contributions to the theoretical understanding of the relationships between engagement, learning styles and learning outcomes. Despite extensive research on both learning and engagement, limited research has been done to investigate how learning styles impact student engagement in instructional activities and how learning styles influence the relationship between engagement and learning outcomes. Our study aims to explore these relationships. Second, the results of our study will provide practical guidance for instructors to design instructional activities that accommodate for individual learning style differences.

References

Ashraf, R., R. Fendler, and M. Shrikhande (2013) "Impact of Personality and Learning Styles on Performance", *Journal of Financial Education,* (39)3/4, pp. 47-68.

Bonwell, C.C. and J.A. Eison (1991) *Active Learning: Creating Excitement in the Classroom*, Washington, DC: George Washington University.

Bostrom, R., L. Olfman, and M. Sein (1990) "The Importance of Learning Style in End-User Training", *MIS Quarterly* (14):1, pp. 101-119.

Broadwell, M.M. and D.C. Broadwell (1996) "How to Get Trainees into the Action", *Training,* (33)2, pp. 52-56.

Carini, R.M., G.D. Kuh, and S.P. Klein (2006) "Student Engagement and Student Learning: Testing the Linkages", *Research in Higher Education,* (47)1, pp. 1-32.

Chapman, E. (2003) "Alternative Approaches to Assessing Student Engagement Rates", *Practical Assessment,* (8)13, pp. 1-7.

Christenson SL, Reschly AL, Wylie C (2012). Handbook of Research on Student Engagement, New York: Springer Science.

Chou, H.W. and T.B. Wang (2000). "The Influence of Learning Style and Training Method on Self-Efficacy and Learning Performance in Www Homepage Design Training", *International Journal of Information Management,* (20)6, pp. 455-472.

Costain, G. and B. McKenna (2011) "Experiencing the Elicitation of User Requirements and Recording Them in Use Case Diagrams through Role-Play", *Journal of Information Systems Education,* (22)4, pp. 367-380.

Dixson, M.D. (2010) "Creating Effective Student Engagement in Online Courses: What Do Students Find Engaging?", *Journal of the Scholarship of Teaching and Learning,* (10)2, pp. 1-13.

Dweck, C.S. (1986) "Motivational Processes Affecting Learning", *American Psychologist,* (41)10, pp. 1040–1048.

Eom, S., H.J. Wen and N. Ashill (2006) "The Determinants of Students' Perceived Learning Outcomes and Satisfaction in University Online Education: An Empirical Investigation", *Decision Sciences Journal of Innovative Education,* (4)2, pp. 215-235.

Feinstein, A.H., S. Mann and D.L. Corsun (2002) "Charting the Experiential Territory", *Journal of Management Development,* (21)10, pp. 732-744.

Freeman, L.A. (2003) "Simulation and Role Playing with Lego(R) Blocks", *Journal of Information Systems Education,* (14)2, pp. 137-144.

Herrmann, K.J. (2013) "The Impact of Cooperative Learning on Student Engagement: Results from an Intervention", *Active Learning in Higher Education*, (14)3, pp. 175-187.

Honey, P., and A. Mumford (1992) *The Manual of Learning Styles*, *3rd edition*, Mainhead, UK: Peter Honey Publications.

Huang, A.H. and R.G, Carroll (1997) "Incorporating Active Learning into a Traditional Curriculum", *American Journal of Physiology,* (273)18, pp. S14-S23.

Kearsley, G. and B. Shneiderman (1998) "Engagement Theory: A Framework for Technology-Based Teaching and Learning", *Educational Technology* (38)5, pp. 20-23.

Kerr, D., A. Troth, and A. Pickering (2003) "The Use of Role-Playing to Help Students Understand Information Systems Case Studies", *Journal of Information Systems Education,* (14)2, pp. 167-171.

Knoll, A.R., H Otani, R.L., Skeel, K.R., Van Horn (2017) "Learning style, Judgements of Learning, and Learning of Verbal and Visual Information", *British Journal of Psychology*, 108(3), p.544-563.

Kolb, D.A. (1976a) *Learning Style Inventory: Technical Manual*. Boston: McBer.

Kolb, D.A. (1984b) *Experiential Learning: Experience as the Source of Learning and Development*. New Jersey: Prentice-Hall.

Lewis, L.H. and C. J. Williams (1994) "Experiential Learning: Past and Present", *New Directions for Adult and Continuing Education,* (1994)62, pp. 5-16.

Lindt, S.F. and S.C. Miller (2018) "Understanding Factors Leading to College Classroom Engagement for Millennials: Development of the College Classroom Engagement Scale", *Higher Education Research,* (3)3, pp. 38-44.

Magal, S. R. & Word, J. (2009) *Essentials of Business Processes and Information Systems* (1st ed.). Wiley.

Marx, A.A., J.C. Simonsen and T., Kitchel (2016) "Undergraduate Student Course Engagement and the Influence of Student, Contextual, and Teacher Variables", *Journal of Agricultural Education,* (57)1, pp. 212-228.

Miller, C.J., J. McNear and M.J. Metz (2013) "A Comparison of Traditional and Engaging Lecture Methods in a Large, Professional-Level Course", *Advances in Physiology Education,* (37), pp. 347-355.

Miller, C.J. and M.J. Metz (2014) "A Comparison of Professional-Level Faculty and Student Perceptions of Active Learning: Its Current Use, Effectiveness, and Barriers", *Advances in Physiology Education,* (38), pp. 246-252.

Moores, T., J. Change and D. Smith (2004) "Learning Style and Performance: A Field Study of Is Students in an Analysis and Design Course", *Journal of Computer Information Systems,* (45)1, pp. 77-85.

Nicholson, D., D. Hamilton and D. McFarland (2007) "Leveraging Learning Styles to Improve Student Learning: The Interactive Learning Model and Learning Combination Inventory", *Journal of Computing Sciences in Colleges,* 22(6), pp. 8-17.

Nunnally, J.C. (1978) *Psychometric Theory*, (2nd ed.) New York: McGraw-Hill.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). "Learning Styles: Concepts and Evidence", *Psychological Science in the Public Interest*, 9(3), pp. 105–119.

Reeve, J. and Lee, W. (2014). "Students' classroom engagement produces longitudinal changes in classroom motivation", *Journal of Education Psychology*, 106, pp. 527–540.

Reid, G. (1985) "Accelerated Learning: Technical Training Can Be Fun", *Training and Development Journal,* (39)9, p. 24.

Rogowsky, B. A., Calhoun, B. M.,& Tallal, P. (2015). "Matching Learning Style to Instructional Method: Effects on Comprehension", *Journal of Educational Psychology*, 107(1), 64–78.

Seethamraju, R. (2007) "Enterprise Systems (Es) Software in Business School Curriculum - Evaluation of Design and Delivery", *Journal of Information Systems Education,* (18)1, pp. 69-83.

Shen, Y., Nicholson, J. and Nicholson, D. (2015) "Using a Group Role-Play Exercise to Engage Students in Learning Business Processes and ERP", *Journal of Information Systems Education*, (26)4, 265-280.

Steinert, Y. and L.S. Snell (1999) "Interactive Lecturing: Strategies for Increasing Participation in Large Group Presentations", *Medical Teacher,* (21), pp. 37-42.

Wiggins, B.L. et al. (2017) "Aspect: A Survey to Assess Student Perspective of Engagement in an Active-Learning Classroom," *CBE - Life Sciences Education,* (16)2.

Wilke, R.R. (2003) "The Effect of Active Learning on Student Characteristics in a Human Physiology Course for Non-Majors", *Advances in Physiology Education,* (27), pp. 207–223.

Zhao, C.M., and G.D. Ku (2004) "Adding Value: Learning Communities and Student Engagement", *Research in Higher Education,* (45), pp. 115-138.

About the Authors

Darren Nicholson is a professor of MIS in the Rohrer College of Business at Rowan University. He received his Ph.D. in Management Information Systems from Washington State University. His research interests include human-computer interaction, virtual teams, virtual experiences (vr/ar), enterprise systems, and IS pedagogy. His research has been published across a wide array of peer reviewed outlets, including IEEE transactions on Professional Communication, Journal of Information Technology Theory and Application, Journal of Information Technology Education, Journal of Information Systems Education, Journal of Organizational and End User Computing, and International Journal of e-Collaboration.

Jennifer Nicholson is an associate professor of MIS in the Rohrer College of Business at Rowan University. She received her Ph.D. in Management Information Systems from Washington State University. Her research interests include information systems pedagogy, human-computer interaction, virtual teams, and enterprise systems. Her research has been published in peer-reviewed outlets such as the International Journal of e-Collaboration, the Journal of Information Technology Education, the Journal of Information Systems Education, the Journal of Organizational and End User Computing, the Journal of Information Technology Theory and Application, as well as Informing Science: The International Journal of an Emerging Transdiscipline.

Yide Shen is an associate professor of MIS in the Rohrer College of Business at Rowan University. She received her Ph.D. in Computer Information Systems from Georgia State University. She also holds a M.S. in Management Information Systems from the University of Nebraska at Omaha. Her current research focuses on leadership in agile software development and information systems pedagogy. Her research is published in Decision Support Systems, Journal of Systems and Software, International Journal of e-Collaboration, Journal of Information Systems Education, and International Journal of Information and Communication Technology in Education.

Pingping Song is an assistant professor of Management at Georgia Gwinnett College. She received her PhD in Management from Georgia State University. Her research interests include strategy and business policy, organization theory, and pedagogy. Her research has been published or accepted for publication in journals including Journal of Digital & Social Media Marketing, International Journal of Intercultural Relations, Finance Research Letters, and Journal of the Academy of Business Education.