The Means to the Desired End: Using the Robust Learning Model (RLM) Approach to Achieve Student Learning Outcomes Regardless of Mode of Delivery

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Abstract

This research study examined the role of the Robust Learning Model in achieving student-learning outcomes, regardless of the mode of delivery, e.g., online and on-campus courses. Results from this archival data analysis show that students in undergraduate level courses provided similar and high responses for items that measured learning outcomes whether they learned in the traditional classroom setting or online courses. The researchers discuss the results of the study along with the unique pedagogy and proprietary technological system that are the primary drivers in achieving the high ratings on student learning outcomes reported by online and on-ground students.

Keywords: Student Learning Outcomes, Student Assessment, Pedagogy, Educational Effectiveness

1. Introduction

Measuring and analyzing student learning outcomes has become an increasingly important aspect of the higher education landscape (Duque &Weeks, 2010; Peterson & Einarson, 2001). Since 2006, academic accountability in the context of accurately measuring student learning outcomes has received significant emphasis in the United States (U.S. Department of Education, 2006). Previously, researchers has shown that student learning outcomes assessment provides an empirical measure of students' mastery of the academic material they have learned and can be considered a key indicator to measure the efficacy of an academic institution to educate their students (Kuh et al., 2006). Research on measuring and evaluating student learning outcomes has generated strong interest from various high level academic stakeholders (e.g. academic institutional leaders and education policymakers). While the traditional academic evaluation of course grades (A-F grading scale) along with monitoring the performance of school alumni employment in the labor market have previously been utilized as measurements of individuals meeting the benchmarks of student learning outcomes, there are also subjective approaches that evaluate students' feelings and perceptions of their own mastery of academic concepts from their courses (Liu et al., 2012). Lizzio et al. (2002) found that student perceptions of their learning environment with the guidance of their faculty in a lecture setting have a greater impact on their student learning outcomes than the course grades they had earned from their previous courses. Students who perceive themselves to be in a highly supportive learning environment perform better than other students who have a poor rating of their student learning environment, even when taking into account pre-test scores prior to starting a course (Lizzio et al., 2002).

Previous research has documented that a highly supportive learning environment is tied with highly effective on-ground instructors. Instructors who continually seek to improve their on-ground teaching skills actively engage in faculty peer consultation, a continual assessment of their classroom management skills, and developing strategies in revising their teaching practices and lesson plans based on student feedback (Macsuga-Gage et al., 2012). In fact, the most effective instructors continually assess how their modified teaching practices have influenced student learning outcomes (Macsuga-Gage et al., 2012).Weimer (2010) has even shown that course content has a stronger influence on student learning more than the number of topics covered in a given course.

Therefore, on-ground instructors who focus more on teaching quality, over the quantity of course topics, have been shown to help their students gain a very good mastery of the focused course topics via engaging in interactive discussions and well designed critical thinking activities (Weimer, 2010). Examples of well designed critical thinking activities employed by effective instructors include role playing, case studies, and cooperative group work. Each of these methods allows the students to effectively apply their knowledge of the course material rather than a simple memorization of information (Lynch, 2008; Paolini, 2015).

There are also some personality traits expressed by effective on-ground instructors that help motivate students to further master the course materials. For example, Furnham and Chamorro-Premuzik (2005) have documented in previous research that teachers who exhibit strong leadership skills along with being perceived as sociable (open communication with students), intelligent, timely in responses (respond quickly to email) and supportive (providing constructive feedback), were more likely to strongly influence the high academic performance of their students. In terms of the perception of faculty intelligence, previous research has documented that on-ground instructors who can succinctly communicate course expectations, develop course assignments and assessments that support student learning, and prepare relatable lesson plans that demonstrate high mastery of course content, contribute to the translation of student's ease in meeting the student learning outcomes. For example, Teitel (2004) found that well-prepared and organized instructors tend to produce high academic performing students (e.g., higher course grades, higher assignment completion, etc.) within their courses as compared to their less prepared or less organized faculty colleagues. Educational Testing Services (1994) found that courses receiving low scores on validated scales measuring Course Organization and Planning by students may indicate that the course structured and developed by an on-ground instructor lacks cohesion and clarity. Similarly, students rated themselves highly in mastering the student learning outcomes of a course perceived that an on-ground course to be well-organized, course material relevant to their personal interests and experiences, and performed better on formative and summative course assessments (i.e., quizzes and exams) as compared to students who had a moderate or low rating of achieving the student learning outcomes (Benton et al., 2013).

Many academic stakeholders such as academic administrators and on-ground teachers strongly consider the integration of technology. For example, video demonstrations and tutorials, course relevant software, and student response platforms in the classroom setting are key trends for 21st century education, especially given the wide-spread use of technology outside of the classroom by Millennial students (Brandtzaeg & Heim, 2011; Isaías et al., 2015; Lichy, 2012; Mott, 2010; Mutekwe, 2015; Taylor & Keeter, 2010). Research examining the impact of classroom technology in encouraging student focused learning found that students tend to have strong ratings of achieving the student learning outcomes in courses with technologically influenced courses as compared to on-ground faculty members who do not use any technology in their classrooms (Park & Choi, 2014). In contrast, other researchers have found that faculty redesigning classrooms and lesson plans to integrate technology to aid in student focused learning results in initially increasing the ratings in achieving student learning outcomes, but these same student ratings tend to return to the baseline perception of student learning outcomes in subsequent courses (Perks, Orr & Al-Omari, 2016). White et al. (2014) argued that the technology that can enable a highly engaged student focused learning environment may even discourage students to be part of the learning process and even cause the students to get distracted by discussing with their fellow students topics that are tangential to the course materials.

Expanding beyond the realm of on-ground teaching, online teaching has made substantial leaps in student enrollment across higher education. Allen and Seaman (2013) documented that there was a three-fold increase in online student enrollment across higher education in the United States between 2002 and 2011 (i.e., 9.6% to 32%). The increase of online student enrollment may be fueled by various factors such as advancements in home computer technology and internet connectivity along with the improvements of online Learning Management Systems (LMS). Most research has shown that effective and engaging online teaching environments adopt many of the effective student focused learning principles that also applies to effective on-ground teaching pedagogies (Arbaugh, 2007; Neumann & Neumann, 2010; Piccoli et al., 2001). Across multiple research studies, the importance of course knowledge and the construct of student learning (Piaget, 1977; Vygotsky, 1978) is more than a simple transmission of information by the online instructor to students via the course materials and course activities (Jonassen et al., 1995). Within an on-ground lecture course led by on-ground faculty members, the course can sometimes be enhanced by classroom technology. However, the constructivist approach of asynchronous online discussions assumes that knowledge is socially constructed through shared understanding by a group of cooperative learners led by an online faculty member who has subject matter expertise to help students engage in higher order thinking of the course content (Bruner, 1985; Vygotsky, 1978). Both Piccoli et al. (2001), associated with the Virtual Learning Environment (VLE) effectiveness model, and Neumann and Neumann (2010), founders of the Robust Learning Model (RLM),

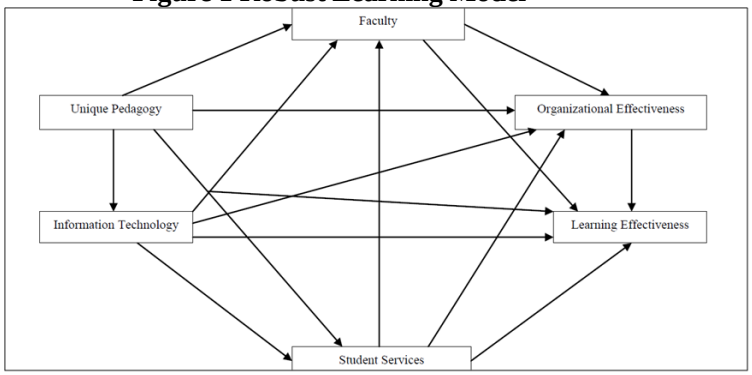
Further assert that the human components (interactions between online students and the online faculty) coupled with the design components (the learning management system) determine the effectiveness of student learning in an online setting. Specifically, the researchers (Neumann & Neumann, 2010; Piccoli, et al., 2001) argued that effective online student learning is maximized via the continuous interplay between the online students, the online instructor and a well-designed Learning Management System (LMS). Tying back to the work by Weimer (2010) who found evidence that teaching quality, rather than the quantity of course topics, allows students to master the course topics, it can strongly be argued that a well-developed and organized course on an online Learning Management system (LMS) can have a significant impact for interplay between the online students and faculty in order to achieve a collaborative learning experience.

Various research studies have documented non-significant differences in student traditional academic evaluation of course grades (A-F grading scale) and student satisfaction when comparing online courses versus on-ground academic course performance (Bernard et al., 2004). In contrast, there is a scarcity of research on comparing the mastery of student learning outcomes which compare on-ground versus online courses. One of the few studies that have explored examining student learning outcomes between on-ground versus online courses was conducted by Stack (2015). In the research study, Stack (2015) examined student ratings between an on-ground Criminology class of 32 students compared with an online Criminology course with another set of 32 students, with one instructor teaching both the on-ground and on-line course during the same semester. The researcher analyzed student responses on questions from the Student Evaluation (SET) which were part of the end of term ratings collected by the academic institution at the end of each course. After each of the 3 sets of end of term ratings were analyzed, Stack (2015) found no statistical differences on the students' ratings of the course (2.4=on ground versus 2.4=online), how much the students learned from the course (2.8=on ground versus 2.8=online), and the teacher efficacy (2.9=on ground versus 2.8=online). Stack's (2015) study does replicate the non-significant difference of student performance in online courses versus on-ground academic course performance (Bernard et al., 2004), but it is important to note that each of the ratings obtained in the study ranged between an average of 2.4 and 2.9, which are below the midpoint rating of 3 based on a 5 point Likert scale. This suggests that Stack's (2015) research study illustrated a below satisfactory student rating of both the online and on-ground Criminology course. Moreover, only one of the key research questions evaluated in the aforementioned study (How much have you learned in this course?) reflects an assessment of student learning outcomes within the course.

The overall goal of the current archival study is to examine multiple End of Term Survey (ETS) student learning outcomes (such as critical thinking skills, writing skills, ability to solve problems, synthesis of student learning outcomes, etc.) for a diverse range of undergraduate on-ground and online courses on topics such as Business and Society, Speech, English Composition and Reading, Introduction to Ethics, College Algebra, etc. Moreover, the intent of this current archival study was to evaluate if the average student ratings of the student learning outcomes at the conclusion of the courses would be above a midpoint of 3 out of a 5 point Likert rating scale between both the on-ground and online courses. A score of greater than 3 (out of a 5 point Likert rating scale) would represent a satisfactory rating for achieving the student learning outcomes across the online and on-ground courses being evaluated.

The unique pedagogy and proprietary system delivered on an on-ground and online teaching format that was evaluated for the current research study is Robust Learning Model (RLM) that was developed by Neumann and Neumann (2010). A summary of the Robust Learning Model (RLM) is shown on Figure 1 below.

Figure 1 Robust Learning Model



Note. Neumann & Neumann (2010)

Some highlights of the components regarding the Robust Learning Model (RLM) include well-trained faculty who are actively engaged with students through class discussions of the assigned course materials, written assignments that are built upon the elaborative faculty-student discussions, a student-centered learning environment based on constructivist learning principles (Bruner, 1985; Vygotsky, 1978), and a feedback loop that allows for continual refinement of the teaching feedback and updating course materials (i.e. teachers keeping the course materials up to date in the last 4 calendar years) leading towards student learning effectiveness.

2. Methodology

2.1 Participants

The sample of participants for this archival study was 116 undergraduate students who were enrolled in Touro University Worldwide between Summer 2014 through Fall 2015. Thirty- three students were enrolled in on-ground courses. The on-ground group had 23 males and 10 females with an average age of 30.51 years old (SD=5.95). On the other hand, 83 students were enrolled in online courses. This online group had 18 males and 65 females with an average age of 31.92 years old (SD=8.97). All these students were enrolled in online and on-ground courses utilizing a proprietary Learning Management System (LMS) coupled with a unique pedagogy, which are both components of the RLM. In the selection criteria for the participants for this archival data analysis, students who enrolled in online courses did not take any on ground courses, and vice versa for on ground students. In reviewing the End of Term Survey (ETS) data (see Measures section) prior to data analysis, there were missing data from several students. Thus, the final distribution of students for data analysis was 28 on-ground students and 75 online students (n = 103).

A large variety of undergraduate online and on-ground courses where the students were enrolled between Summer 2014 until Fall 2015were sampled for this research study. The on-ground and online courses sampled in this archival analysis of the End of Term Survey student ratings were in the areas of Business and Society, Speech, Culture and Society, Macroeconomics, English Composition and Reading, Introduction to Ethics, College Algebra, Introduction to Logic, United States History and Constitution, Introduction to Sociology, and Microeconomics.

2.2 Measures

The outcomes measures reported in this study are from the End of Term Survey ratings self-reported by the students in response to their self-assessment of their learning experiences with each corresponding course taken between Summer 2014 through Fall 2015. Each question on the End of Term Survey was answered by the students via a 5 point Likert scale (5=Very High, 4=High, 3=Neither High or Low, 2=Low, 1=Very Low, Not Applicable=0).The Cronbach's Alpha across all the 12 End of Term items is 0.91.

3. Results

A multivariate analysis of variance (MANOVA) was conducted with 12 End of Term Survey ratings as dependent variables and course format (online versus on-ground) as the independent variable. Prior to analyzing the overall multivariate effect, the Box test of Equality of Covariance Matrices for the MANOVA was first examined. It was found that the Box test of Equality of Covariance Matrices for the MANOVA analysis was statistically significant, $F(78, 8845)= 2.72$, $p<0.001$. Because of the significant Box test of Equality of Covariance Matrices, this suggests that the researchers needed to use the Pillai's Trace values to examine the overall the multivariate effect. The overall MANOVA found no multivariate effect based on course format, Pillai's Trace=0.171, $F(12,90)=1.545$, $p=0.123$. As illustrated in Table 1, there are no statistical differences across the various measures based on the course format taken by the students.

Table 1. **Online versus On-ground Ratings Means (and Standard Deviations) for the 12 End of Term Survey Course Items**

End of Term Survey Course Items	On-Ground	Online	F	Sig.
1. Course Improves My Critical Thinking	4.6 (0.56)	4.6 (0.63)	0.014	0.905
2. Assignments Related to Course Goals	4.7 (0.55)	4.7 (0.55)	0.315	0.576
3. Course Developed My Writing Skills	4.2 (1.19)	4.6 (1.00)	2.661	0.106
4. Course Developed My Oral Skills	4.1 (1.26)	4.1 (1.54)	0.007	0.934
5. Course Helped Me Identify and Solve Problems	4.5 (0.79)	4.5 (0.89)	0.098	0.755
6. Course Helped Me Use Research in Real Life	4.1 (1.33)	4.5 (0.92)	3.109	0.081
7. Learned Information Literacy Skills	4.2 (1.10)	4.3 (1.38)	0.166	0.684
8. Course Increased Cultural Awareness	4.2 (1.37)	3.9 (1.70)	0.612	0.436

9. Increased My Knowledge of Diverse Perspectives	4.0 (1.43)	4.0 (1.72)	0.043	0.863
10. Developed Ethics via Academic Integrity	4.2 (1.39)	4.6 (1.03)	2.135	0.147
11.Signature Assignment Helped Me Synthesize SLO	4.2 (1.13)	4.5 (0.92)	2.152	0.145
12. Learning can be Applied Beyond the University	4.7 (0.61)	4.7 (0.77)	0.176	0.676

4. Conclusion

The findings of this study replicate various non-significant differences in student achievement and attitudes when comparing online courses versus on-ground course performance (Bernard et al., 2004). On the other hand, the findings of this study improve upon the findings of previous research examining the end of course ratings between online versus on-ground learning formats by sampling end of course ratings regarding the achievement of student learning outcomes from diverse undergraduate courses (Business and Society, Speech, Culture and Society, Macroeconomics, English Composition and Reading, Introduction to Ethics, College Algebra, Introduction to Logic, United States History and Constitution, Introduction to Sociology, and Microeconomics) rather than just focusing on one undergraduate course (Criminology, Stack, 2015; Statistics, Summers et al., 2005; Introduction to Sociology, Driscoll et al., 2012; Organization and Management, Daymont, & Blau, 2008; English Composition, Finlay et al., 2004). Furthermore, this research study found that the average end of course ratings across all 12 questions ranged between 4.7 and 3.9 which reflects ratings of Very High or High. The latter result suggests that the RLM course format, provided in either the online or the on-ground format, was best suited to meet the Student Learning Outcomes for the corresponding courses as rated by the corresponding students. The results of the current research study showing high student learning outcome ratings ties back to previous research findings that highlighted that quality of instructor interaction (Bush et al., 2010; Eom & Ashill, 2016; Finlay et al., 2004) and the quality of course design (Eom & Ashill, 2016; Finlay et al., 2004; Jaggars, & Xu, 2016; Moallem, 2003; Swan et al., 2012) are both important considerations towards meeting high student learning achievement. Another key result of this research study is the delineating high self-reported student learning outcomes across a variety of learning competencies or domains such as writing skill, critical thinking skills, information literacy skills, oral communication skills and ethical awareness. Several of these key learning competencies or domains have been the focus of evaluation by various academic accreditation bodies throughout the United States (e.g., Western Association of Association of Schools and Colleges and Higher Learning Commission). Overall, this research study provides some initial empirical evidence that these high self-reported student learning competencies can be obtained from both on-ground and online teaching modalities that use the Robust Learning Model (RLM) pedagogy. The researchers argue that well-trained faculty who are actively engaged with students through class discussions of the assigned course materials, written assignments that are built upon the elaborative faculty-student discussions, a student-centered learning environment based on constructivist learning principles (Bruner, 1985; Vygotsky, 1978), and a feedback loop that allows for continual refinement of the teaching feedback and updating course materials were the key components of the Robust Learning Model (RLM) pedagogy that helped lead towards high self-reported student learning competencies reported in this study. Most importantly, the feedback loop built into the Robust Learning Model (RLM) pedagogy appears to keep the teachers strongly invested in their continual improvement of their own teaching skills along with keeping up with the current trends in the academic and professional literature that pertains to the courses which they teach.

Despite the statistically significant results in this research study, there are still some limitations. One limitation is that the sample of students for this research study was taken from various undergraduate general education courses. Thus, future research studies can examine if the results of this study will be replicated in undergraduate upper division courses and even graduate level courses on specialized academic domains (e.g. Psychology, Business, Biology, etc.). Furthermore, future research can also examine if the current advancements in on-ground classroom technology (i.e. Kahoot in-class quiz system using smart phones, Dellos, 2015) that can be used by faculty to improve classroom teaching have been adopted across other institutions of higher education in order to enhance self-reported ratings on student learning outcomes to possibly exceed the student self-reported ratings on student learning outcomes in comparable online teaching platforms.

Future research can also explore if the quality of both on-ground and online faculty training can play a role towards encouraging student engagement in the classroom setting thus influencing the student learning self-efficacy of the course materials. Currently, the research literature has mostly focused on the effectiveness and shortcomings of graduate teaching assistant teaching training programs to prepare graduate teaching assistants for undergraduate classroom teaching (Chiu & Corrigan, 2019; Schussler et al., 2015), but there is a lack of any research studies that have examined the efficacy of professional training for on-ground and online faculty to help students to remain engaged in course learning as well as help to gain mastery of the student learning outcomes for their corresponding courses.

In conclusion, the current research study provides evidence of the comparable student learning outcomes that can be obtained in an on-ground or an online classroom setting. Moreover, this research study also provides evidence that having well-trained faculty who are actively engaged with students through class discussions of the assigned course materials, written assignments that are built upon the elaborative faculty-student discussions, a student-centered learning environment based on constructivist learning principles (Bruner, 1985; Vygotsky, 1978), and a feedback loop that allows for continual refinement of the teaching feedback and updating course materials are key components that help students towards accomplishing high levels of student learning outcomes.

References

Arbaugh, J. B. (2007). An Empirical Verification of the Community of Inquiry [Electronic Version]. *Journal of Asynchronous Learning Networks*, 11. Retrieved from https://pdfs.semanticscholar.org/7d79/7f46ba75e8735a58372a74507625d1f2712d.pdf

Allen, I. E., & Seaman, J. (2013). Changing course: Ten years of tracking online education in the United States. Babson Survey Research Group. Pearson Publishers and Sloan Foundation

Benton, L. S., Duchon, D., & Pallett, W. H. (2013). Validity of student self-reported rat-ins of learning. *Assessment & Evaluation in Higher Education*, 38, 377-388.

Bernard, R. M., Abrami, P. C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L.,&Huang, B. (2004). HowDoes Distance Education Compare With Classroom Instruction? A Meta-Analysis of the EmpiricalLiterature. *Review of Educational Research, 74*(3), 379–439.

Brandtzaeg, P.&Heim, J. (2011). Typology of social networking sites users. *International Journal of Web Based Communities, 7*(1), 28–51.

Bruner, J. (1985). Vygotsky: An historical and conceptual perspective. In James V. Wertsch (Ed.), Culture, communication, and cognition: Vygotskian perspectives. New York: Cambridge University Press, 21–34.

Bush, R., Castelli, P., Lowry, P., & Cole, M. (2010). The importance of teaching presence in online and hybrid classrooms. In *Proceedings of the Academy of Educational Leadership*, *15*(1). 7-13.

Chiu, P. H. P., & Corrigan, P. (2019). A study of graduate teaching assistants' self-efficacy in teaching: Fits and starts in the first triennium of teaching. *Cogent Education, 6*(1), Retrieved from https://www.tandfonline.com/doi/full/10.1080/2331186X.2019.1579964

Daymont, T., & Blau, G. (2008). Student performance in online and traditional sections of an undergraduate management course. *Journal of Behavioral and Applied Management*, *9*(3), 275-294.

Dellos, R. (2015). Kahoot! A digital game resource for learning. International Journal of *Instructional Technology and Distance Learning, 12*(4), 49-52.

Driscoll, A., Jicha, K., Hunt, A. N., Tichavsky, L., & Thompson, G. (2012). Can online courses deliver in-class results? A comparison of student performance and satisfaction in an online versus a face-to-face introductory sociology course. *Teaching Sociology*, *40*(4), 312-331.

Duque, L. C., & Weeks, J. R. (2010). Towards a model and methodology for assessing student learning outcomes and satisfaction. *Quality assurance in education, 18*(2), 84-105.

Educational Testing Services (1994). The development of the Student Instructional Report II. Retrieved from http://www.ets.org/Media/Products/283840.pdf.

Eom, S. B., & Ashill, N. (2016). The determinants of students' perceived learning outcomes and satisfaction in university online education: An update. *Decision Sciences Journal of Innovative Education, 14*(2), 185-215.

Fabry, D. L. (2009). Designing online and on-ground courses to ensure comparability and consistency in meeting learning outcomes. *Quarterly Review of Distance Education*, *10*(3). 253-261.

Finlay, W., Desmet, C., & Evans, L. (2004). Is it the technology or the teacher? A comparison of online and traditional English composition classes. *Journal of Educational Computing Research, 31*(2), 163-180.

Furnham, A., & Chamorro-Premuzic, T. (2005). Individual differences in students' preferences for lecturers' personalities. *Journal of Individual Differences, 26*(4), 176–184.

Isaías, P., Spector, J.M., Ifenthaler, D. & Sampson, D. (2015) E-learning systems, environments and approaches: Theory and implementation. In: Isaías, P., Spector, J.M., Ifenthaler, D. & Sampson, D. (eds.) E-learning Systems, Environments and Approaches. Berlin: Springer, pp. 1–7.

Jaggars, S. S., & Xu, D. (2016). How do online course design features influence student performance? *Computers & Education*, 95, 270-284.

Jonassen, D., Davidson, M.,Collins, M. C. J.,& Haag, B. B. (1995). Constructivism and computer-mediated communication in distance education. *The American Journal of Distance Education, 9*(2), 7–26.

Kuh, G. D., Kinzie, J., Buckley, J. A., Bridges, B. K., &Hayek, J. C. (2006). What matters to student success: A review of the literature (Report commissioned for the National Symposium on Postsecondary Student Success: Spearheading a Dialog on Student Success). Washington, DC: National Postsecondary Education Cooperative.

Lichy, J. (2012) Towards an international culture: Gen Y students and SNS? *Active Learning in Higher Education, 13*(2), 101–116.

Liu, O. L., Bridgeman, B., & Adler, R. M. (2012). Measuring learning outcomes in higher education: Motivation matters. *Educational Researcher, 41*(9), 352-362.

Lizzio, A., Wilson, K., & Simons, R. (2002), University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Studies in Higher Education, 27*(1), 27-52.

Lynch, D. J. (2008). Confronting challenges: Motivational beliefs and learning strategies in difficult college courses. *College Student Journal*, 42, 416–421.

Macsuga-Gage, A. S., Simonsen, B., & Briere, D. E. (2012). Effective teaching practices that promote a positive classroom environment. *Beyond Behavior*, 1-11.

Moallem, M. (2003). An interactive online course: A collaborative design model. *Educational Technology Research and Development, 51*(4), 85-103.

Mott, J. (2010). Envisioning the post-LMS Era: The open learning network. *Educause Quarterly 33*(1), 1–9.

Mutekwe, E. (2015). Higher education and the social media technology: A dilemma unfolding in institutions of higher learning. *Journal of Education and Human Development, 4*(3), 119–133.

Neumann, Y., & Neumann, E. F. (2010). The Robust Learning Model (RLM): A Comprehensive approach to a new online university. *Journal of College Teaching & Learning (TLC), 7*(1).

Paolini, A. (2015). Enhancing Teaching Effectiveness and Student Learning Outcomes. *Journal of Effective Teaching, 15*(1), 20-33.

Park E.L.&Choi B.K. (2014) Transformation of classroom spaces: Traditional versus active learning classroom in colleges. *Higher Education, 68*(5), 749–771.

Perks, T., Orr D., &Al-Omari, E. (2016) Classroom re-design to facilitate student learning: A case study of changes to a university classroom. *Journal of the Scholarship of Teaching and Learning 16*(1), 53–68.

Peterson, M.W.,&Einarson, K.E. (2001), "What are colleges doing about student assessment? Does it make a difference?" *The Journal of Higher Education, 72*(6), 629-669.

Piaget, J. (1977). Equilibration of cognitive structures. New York: Viking Press.

Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic it skills training. *MIS Quarterly, 25*(4), 401–426.

Schussler, E. E., Read, Q., Marbach-Ad, G., Miller, K., & Ferzli, M. (2015). Preparing biology graduate teaching assistants for their roles as instructors: An assessment of institutional approaches. *CBE—Life Sciences Education, 14*(3), ar31. Retrieved from https://www.lifescied.org/doi/pdf/10.1187/cbe.14-11-0196

Stack, S. (2015). Learning outcomes in an online vs traditional course. International *Journal for the Scholarship of Teaching and Learning, 9*(1), 1-18.

Summers, J. J., Waigandt, A., & Whittaker, T. A. (2005). A comparison of student achievement and satisfaction in an online versus a traditional face-to-face statistics class. *Innovative Higher Education, 29*(3), 233-250.

Swan, K., Matthews, D., Bogle, L., Boles, E., & Day, S. (2012). Linking online course design and implementation to learning outcomes: A design experiment. *The Internet and Higher Education, 15*(2), 81-88.

Taylor, P.,& Keeter, S. (2010) Students: A Portrait of a Generation. Washington, DC: Pew Research Centre. Retrieved from http://www.pewresearch.org/millennials

Teitel, L. (2004). How professional development schools make a difference: A review of research. (2nd Ed. Revised). Washington, D.C. National Council for Accreditation of Teacher Education.

U.S. Department of Education. (2006). A test of leadership: Charting the future of American higher education (Report of the commission appointed by Secretary of Education Margaret Spellings). Washington, DC: Author.

Vygotsky, L. S. (1978). Mind in society: Development of higher psychological process. Cambridge, MA: Harvard University Press.

Weimer, M. (2010). Building rapport with your students. Retrieved from http://www.facultyfocus.com/articles/teaching-and-learning/building-rapport-with-your-students/

White, C., Bradley, E., Martindale, J., Roy, P., Patel, K., Yoon, M.,& Worden, M.K. (2014) Why are medical students 'checking out' of active learning in a new curriculum? *Medical Education*, 48, 315–24.