# LEARNING READINESS WHEN SHARING KNOWLEDGE WHILE E-LEARNING

Anjum Razzaque[1], Allam M. Hamdan[2], Mukhtar Al-Hashimi[3] and Esra S. Aldahean[4]

*Ahlia University, Bahrain*
*[1]Assistant Professor, MIS Dept. Chairperson, College of Business & Finance*
*[2]Associate Professor, Dean of College of Business & Finance*
*[3]Professor, Vice President of Academic Affairs*
*[4]Assistant Professor, Director of Centre for Accreditation & Quality Assurance*

## ABSTRACT

Past research indicates the importance of assessing the role of higher education (HE) students' Learning Readiness's (LR's (Self-Directed Learning - SDL and Motivation for Learning - MFL) on learning behaviors (Knowledge Sharing Quality -KSQ) during e-learning in developing countries. This article is a critique of a literature review led to a conceptual framework which in turn was empirically investigated (correlation analysis, using Pearson and Spearman correlation) shed new knowledge. This deductive cross-sectional research confirms this role via an adopted survey, n = 253 Ahlia University undergraduate e-learners, hence confirming positively significance between SDL → KSQ and, MFL → KSQ: new knowledge contributions.

## KEYWORDS

Knowledge Sharing, Learner Readiness, E-Learning, Moodle, Higher Education.

## 1. INTRODUCTION

The teaching and learning domain incorporates e-learning with regular face-to-face teaching to harness online work collaboration. The question is whether students are ready for this. Therefore, assessing learner readiness using a survey instrument, for e-learning, is essential. Such a quantitative instrument has been used, been improved and re-used again by scholars, particularly in the educational sector. Initially learning readiness (LR) was based on learning self-management of e-learning. (Hung, et al., 2010). LR is an inquiry driven interest. It is, therefore, a driving force behind the behavior of sharing quality knowledge (Rotgans and Schmidt, 2017). Rotgans and Schmidt assessed such a statement as a hypothesis, and reported two types of interests, individual and situational, where individual interest is personal interest and situational interest is a temporary event encountered by a learner. Individual interest encounters ample engagement and as a result experiences an inspiration for deeper learning through deeper processing of reading materials encountered through personal interest upon a topic of research. Therefore being interested determines how much can be achieved from a learning outcome (LO) (Rotgans and Schmidt, 2017).

In education research scholars have contributed instruments pertaining to e-LR and mobile- learning readiness. They made empirical evidenced conclusions based on investigations done at regional and country-level. Scholars performed micro-level investigations, in which learners and instructors were the target populations. At the micro-level, individual attitudes, skills and knowledge become the key aspects of the investigation. Unfortunately, such conceptual frameworks fall short since they tend to adapt inconsistent unidimensional understandings of LR (Blayone, et al., 2018). Hao (2016) targeted undergrad Education majors and attained 84 responses when they wanted to assess the role of LR on flipped learning (FL). FL is highly important in higher education (HE) learning environments. This student-centered form of learning evidences successful during its LO achievements in the HE environments and in a FL approach student are required to learn facets of knowledge before arriving to their class. This way during class sessions, an instructor can direct learners through personalized and individually oriented instructions, i.e. through assignments, problem-solving session for personalized in-class learning. Unfortunately, on the one hand some scholars report students outperform in FL vs. traditional classroom while some other scholars express lack of LR towards FL. This is

due to limited empirical evidence. Additional research is necessary to furnish more empirical confirmation for FL LR to appreciate what learners truly want from FL; considering that FL cannot satisfy needs of all students (Hao, 2016).

As per the gap and since LR drives acquisition of knowledge, driver of knowledge sharing (KS) (Rotgans and Schmidt, 2017), one can investigate the role of LR on KS quality (KSQ): un-chartered territory as a need to assess the role of e-LR for effective utilization of KS for better learning support. In such networks teaching-learning quality is enhanced, yet research is needed for assessing LR →KSQ during e-learning: a need for future research in developing countries. Past scholars assessed LR scales, to explore knowledge and skills for e-learning by testing technical skills and teacher/learner achieved behaviors when preparing for LR. However past scales identified problem areas without a solution to correcting any short-coming (Gay, 2016).

The role of LR for KS in e-learning environments like Moodle, a platform used at Ahlia University (i.e. Case University for this research context in the Kingdom of Bahrain - a Middle Eastern developing country) is an important area of research. Furthermore, learners' KS behavior is important in the e-learning context when learners share knowledge to learning experiences on platforms like Facebook. KSQ becomes an effective measure of perceived learning effectiveness because SDL occurs virtually during KS, which further strengthens their knowledge (Li, et al., 2016). When KS occurs within virtual environments, such a behavior transforms traditional learning environments to an e-learning environment where participation within virtual contexts and KS can be between learners and their instructors. E.g. KS can be learners attaining feedback from their instructors in virtual e-learning environments (Li, et al., 2016). Last but not least, the KS behavior gained little focus from scholars when it comes to investigating the unclear episodic nature of KS: particularly when it comes to KS being a citizen behavior; as this is one of the two types of KS behaviors with the other being the rewarded behavior. The citizen behavior implies that supervisor (i.e. instructor in the case of the HE) and coworkers (i.e. learners as the case of higher education) perceive usefulness of KS, thus indulge in this behavior. However, it is unclear if such KS is a reward behavior and if so then it is due to indulging in such a behavior (Zhang and Jiang, 2015). Similar is the dilemma within the education sector and this is the reason for the following conceptual framework of this study.

## 2. CONCEPTUAL FRAMEWORK

This study assesses the role of LR (independent variable) on their KSQ (dependent variable). LR's SDL and motivation for learning (ML) (independent variables). Hence proposing 2 hypotheses: (1) learners' SLD is positively signifies with KSQ and ML positively signifies withr KSQ.
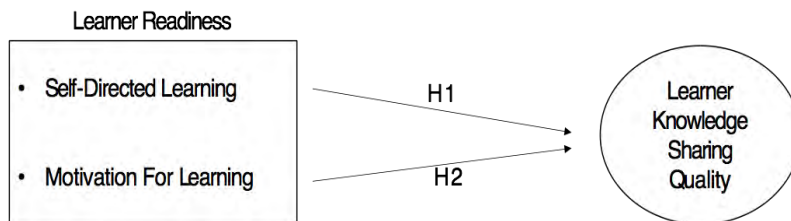


Figure 1. Conceptual Framework

## 3. LITERATURE REVIEW

Technical skills and learner control significantly define learning readiness: a concept originated from Australia since 1998. The first LR instrument was developed and tested in 2000. LR shapes online attitudes and behaviors making students more active learners and instructors no longer central in virtual environments. Learner control makes learner responsible of self-learning. The two dimensions of LR are SDL, which inspires learners for self-learning and ML, which sets the learner's attitude and behavior such that ML affects learning performance (Hung, et al., 2010). Hung, et al. empirically assessed LR instrument on a five-point-Likert-Scale on 1,051 students from 3 Taiwan universities. A model was confirmed valid and reliable. With reference to learner readiness, 121 studies, from 1965 to 1992, empirically confirmed a correlation between interest and academic achievement; making future scholars gain interest on LR as the independent and knowledge outcomes as the

dependent variable in empirical assessments. Still, the confusion is whether it is LR that causes learners to gain knowledge since it is possible that increase of knowledge of a topic inspires interest in that topic (Rotgans and Schmidt, 2017). Rotgans and Schmidt ventures forth to establish the right empirically evidenced direction between interest and knowledge. The confusion is that while some scholars support the notion that knowledge inspires interest, other scholars assessing the role of attitudes on learning, state that not knowledge alone, but achievement, predict an attitude to inspire an interest for learning especially in female learners. Two studies tested these three hypotheses; i.e. (1) cross-lagging of panel analysis on 186 primary science students to a problem oriented learning activity where interest and knowledge were separately studies at two different times. To further validate the empirical findings (2) two quasi-experiments were carried out via 68 secondary 14 year old students to assess the nature of the relation between interest and knowledge. In another study, 84 undergraduate students, from two courses, participated by first watching YouTube videos, Audios via Moodle, textbook readings and other information-lookups on the Internet before class: as per norms of FL strategy. Students were given an e-quiz assessing their academic performance via their own devices, like smart phones, tablets, etc. Group discussion were instructor-led and tasks involved website-evaluations and end-of-class discussions. Students participated in a survey providing feedback on FL strategy. Empirical findings indicate 60% respondents recognized merits of FL. Those learners who did not prepare before classes still appreciate FL. While students appreciated FL they were not responsible due to low ML (Hao, 2016).

SDL has existed for forty years in tertiary education and has inspired student in self-learning. It requires self-determination: dependable on aptitude and self-assertiveness. Such characteristics are investigated and empirically indicate that instructor can inspire SDL in learners and prove that SDL influences KS (Alshaikh, et.al, 2017). So, an instructor's positive behavior inspires learners to gain knowledge. SDL is an objective of HE institutions with growing acknowledgement for implementation, especially with rising challenges in GCC HE institutions for quality assurance requirements (Costandi, et.al, 2018). SDL proves vital since such is a human powering learner characteristic for sustaining knowledge society via metacognition, thinking and self-recognition (Toit-Brits and Zyl, 2017). Research is lacking on students with disabilities due to limited HE resources. In this scenario SDL proves most effective since it is a cost effect means of learning, especially for students with disabilities (Garderen, et al., 2017). Such a learning technique is encouraged in graduate medical schools. To assess SDL, medical and post-grad students were exposed to simulation based in-lab training sessions and requested to practice laparoscopic skills. Subsequently a survey was conducted addressed learners habits and obtain learners feedback for curriculum improvements. Empirical evidence suggested that participants improved in their practical skills and reported SDL during their individual endeavors to improve practical skills (Aho, et al., 2015). Since technology is widely used in education it should be integrated with teaching and learning (TaL). Impact of technological on TaL is still unclear in research, i.e., to what extent technology enhances academic performance via e-learning. Research in the past two-decades evidenced positives and negatives of integrating technology in e-learning. While research probed technology's role on e-learning other studies examined SDL's role in education. Current literature suggests integrating these two research themes. Even though scholars explore these themes, there is still lacking empirical evidence to holistically assess technology's role, student engagement, SDL and academic performance (Rashid and Asghar, 2016). It is evident how positively SDL affects academic performance. Also, accumulative assessment encourages learners to work harder: the issue being that not all students are responsive towards SDL. Current research expresses the importance of assessing learner behavior to improve their responsiveness (Tio, et al., 2016).

The motivation of informal learning is not institutional sponsored but originates with the learner who seeks knowledge and skills by reading or by peer KS for feedback. Such ML aids a learner to stay abreast with the dynamics of updating one's self of new knowledge and such collective knowledge proves sustainable versus the knowledge gained through an instructor. Informal form of learning, i.e. ML, has gained scholarly interest in recent literature. This is especially considering that past research has been paying a lot of attention on factors like self-efficacy and learning motivation (van Rijn, et al., 2013). The ML research area is investigated before the e-learning ear in schools but less in HE though such need exists. E.g. five students were targets of a case study investigating their ability to tackle math problems of a particular discipline. Empirical evidence confirmed that challenging students in problem-solving improves ML in math. Since math is hard problem-solving via rigid algorithms. Scarce research assesses ML in mathematics for Arab student with disabilities. Future research could investigate this matter (Bishara, 2016). In another study 7th grade Cyprus students' ML in Biology was examined when these target students' tests were used as indicators to measure level of understanding of a material, following survey distribution to assess ML in this subject. Findings indicated the contribution of gender, prior knowledge and ML moderate learning in Biology via inquiry: an important finding since past scholars indicated lack of understanding regarding gender, knowledge or ML (Hadjichambis, et al., 2016).

## 4.  RESEARCH METHODOLOGY

This study's critiqued literature to understand the research gap in e-learning research. The review phase led to research questions and objectives and a conceptual framework with two hypotheses, tested thru collected data from 253 of 700 Ahlia University College of Business and Finance students. Data analysis via descriptive and advanced descriptive analysis occurred by correlation analysis (next section). This deductive research approach cross-sectionally confirms two hypotheses via an adopted survey instrument from: LR adapted from (Hung, et al., 2010) and KSQ adapted from (Chiuet al., 2006). Though this instrument is adapted; past research has not assessed the role of KSQ in a HE sectors.

## 5.  DATA ANALYSIS

The following section portrays the analyzed data expressed through the six tables depicted below. Table 1 depicts the respondents' profiles as data, using an adapted and integrated survey was used. 253 respondents participated and as per Table 1, gender wise the same has 133 males and 120 females in multicultural classrooms. This evidences that there is a normal distribution in this study's sample. Student level wise the data is normally distributed considering that freshmen, sophomore, junior and seniors were around 25% mark of responding participants. Student status wise; majority of target student population at Ahlia University's College of Business and Finance is Gulf Corporation Council (GCC) students. College of Business and Finance program wise: there seems to be a normal distribution considering the total number of students in their respective programs versus the total number to students in the College of Business and Finance.

Table 1. Profile of respondents

| Sample Characteristics | | Frequency | Percent |
|---|---|---|---|
| Gender | Male | 133 | 53% |
| | Female | 120 | 47% |
| | Total | 253 | 100% |
| Student Level | Freshman | 65 | 26% |
| | Sophomore | 64 | 25% |
| | Junior | 64 | 25% |
| | Senior | 60 | 24% |
| | Total | 253 | 100% |
| Student Status | GCC student | 185 | 73% |
| | Non-GCC student | 68 | 27% |
| | Total | 253 | 100% |
| Program Enrolled in | BSMIS | 40 | 16% |
| | BSAF | 94 | 37% |
| | BSMM | 53 | 21% |
| | BSBF | 44 | 17% |
| | BSEF | 22 | 9% |
| | Total | 253 | 100% |

  
As per KSQ (Table 2) 64% agree and 31% strongly agree, with mean = 3.8, i.e. > 3 with SD = 1.5, indicating that the general % = 78%, i.e. 78% of sample agree that e-learning aids KSQ. Quite similar were analysis of remaining KSQ items; with highest general % for KS1 and lowest for KS6. Similarly, learners' SDL (Table 3), and learners' ML (Table 4) express all items satisfactory mean (3.54 to 3.78) i.e. > 3 and general % (71% to 77%). Path analysis of 3 variables, SDL. ML and KSQ, (Table 5), based on gender, student level and College of Business and Finance program; the authors of this article divided sample in two parts as per sample characteristic. E.g. gender, male and female, compared with 3 variables indicates KSQ for males reflected similar with females: no difference significance > 5% for t and z-test. Gender difference would be reflected if the significance was < 5.

Table 2. Learners' Knowledges sharing quality

| Learners' KSQ | Strongly disagree | Disagree | Neither | Agree | Strongly agree | Mean | SD | General Percent |
|---|---|---|---|---|---|---|---|---|
| KS1: The knowledge shared between instructor and students in Moodle is easy to understand. | 6.7 | 6.7 | 8.7 | 46.6 | 31.2 | 3.89 | 1.125 | 78% |
| KS2: The knowledge shared between instructor and students in Moodle is relevant | 5.5 | 7.5 | 10.3 | 47.4 | 29.2 | 3.87 | 1.087 | 77% |
| KS3: The knowledge shared between instructor and students in Moodle is accurate. | 5.9 | 4.3 | 17 | 50.2 | 22.5 | 3.79 | 1.031 | 76% |
| KS4: The knowledge shared between instructor and students in Moodle is complete. | 7.9 | 6.7 | 16.2 | 40.3 | 28.9 | 3.75 | 1.173 | 75% |
| KS5: The knowledge shared between instructor and students in Moodle is reliable. | 5.1 | 7.1 | 13.4 | 49 | 25.3 | 3.82 | 1.052 | 76% |
| KS6: The knowledge shared between instructor and students in Moodle is timely. | 6.7 | 6.3 | 18.2 | 47.8 | 20.9 | 3.7 | 1.079 | 74% |

For student level; this study's sample was divided to four levels: freshman, sophomore, junior and senior: to be compared with three variables; thus resulting into three variables similarly distributed amongst four student levels: i.e. there is no empirically difference in the three variables and students' level as significance is > 5% for the t and z-test. The three variables were compared with College of Business and Finance's programs: (1) BSMIS – B.Sc. Management Information Systems, (2) BSAF –Accounting and Finance, (3) BSMM –Management and Marketing, (4) BSBF - Banking and Finance and (5) BSEF – B.Sc. Economic and Finance. There is no difference between programs with reference to three variables: BSMIS was highest (mean = 4.114) following BSEF (4.000), BSMM (3.814), BSAF (3.432) and BSBF (1.023): i.e. sig. < 5%: expressing difference in College of Business and Finance programs. Table 6 describe, Correlation Matrix, and considering that the independent variable in Figure 1 is learner readiness's two dimension, SDL and ML (independent variables) and learners' KSQ (dependent variable); empirical findings are based on the correlations using parametric test, i.e. Pearson correlation and non-parametric test, i.e. spearman test. This is to confirm this study's empirical results, which therefore. Indicate a positively significant correlation (sig < 0.01%) between learner learners' SDL → learners' KSQ, i.e. based on 62.5% positive correlation. Furthermore, there is positive correlation between learners' ML → learners' KSQ.

Table 3. Learners' SDL

| (SDL | Strongly disagree | Disagree | Neither | Agree | Strongly agree | Mean | SD | General Percent |
|---|---|---|---|---|---|---|---|---|
| SDL1: I carry out my own study plan. | 8.3 | 7.5 | 17.4 | 34.4 | 32.4 | 3.75 | 1.22 | 75% |
| SDL2: I seek assistance when facing learning problems. | 7.5 | 14.2 | 14.2 | 40.3 | 23.7 | 3.58 | 1.207 | 72% |
| SDL3: I manage time well. | 10.7 | 9.1 | 20.2 | 35.6 | 24.5 | 3.54 | 1.252 | 71% |
| SDL4: I set up my learning goals | 7.9 | 7.1 | 17.8 | 42.3 | 24.9 | 3.69 | 1.155 | 74% |
| SDL5: I have higher expectations for my learning performance. | 5.5 | 7.5 | 15.8 | 39.1 | 32 | 3.85 | 1.122 | 77% |

Table 4. Learners' ML

| ML | Strongly disagree | Disagree | Neither | Agree | Strongly agree | Mean | SD | General Percent |
|---|---|---|---|---|---|---|---|---|
| ML1: I am open to new ideas. | 6.7 | 8.7 | 17.8 | 34.8 | 32 | 3.77 | 1.184 | 75% |
| ML2: I have motivation to learn. | 6.3 | 8.7 | 15.8 | 39.1 | 30 | 3.78 | 1.154 | 76% |
| ML3: I improve from my mistakes. | 6.3 | 9.5 | 11.9 | 44.7 | 27.7 | 3.78 | 1.14 | 76% |
| ML4: I like to share my ideas with others. | 7.1 | 9.9 | 16.2 | 41.1 | 25.7 | 3.68 | 1.166 | 74% |

Table 5. Path analysis for study variables

| Characteristics | | Number | KSQ | SDL | Motivate Learning |
|---|---|---|---|---|---|
| Gender | Male | 133 | 3.800 | 3.683 | 3.752 |
| | Female | 120 | 3.800 | 3.703 | 3.765 |
| Difference tests | t-test | | -0.158 | -0.162 | -0.100 |
| | Sig. | | (0.874) | (0.871) | (0.920) |
| | z-test | | -0.533 | -0.011 | -0.946 |
| | Sig. | | (0.594) | (0.991) | (0.344) |
| Student Level | Freshman | 22 | 3.932 | 3.713 | 3.598 |
| | Sophomore | 174 | 3.826 | 3.698 | 3.794 |
| | Junior | 51 | 3.711 | 3.635 | 3.667 |
| | Senior | 6 | 3.571 | 3.450 | 3.875 |
| Difference tests | F-test | | 0.450 | 0.128 | 0.411 |
| | Sig. | | (0.717) | (0.943) | (0.746) |
| | Chi-square | | 5.122 | 1.219 | 0.717 |
| | Sig. | | (0.163) | (0.748) | (0.869) |

| Program | BSMIS | 40 | 3.864 | 3.723 | 4.114 |
|---|---|---|---|---|---|
| | BSAF | 94 | 3.814 | 3.632 | 3.432 |
| | BSMM | 53 | 3.914 | 3.838 | 3.814 |
| | BSBF | 44 | 3.584 | 3.441 | 1.023 |
| | BSEF | 22 | 3.883 | 3.945 | 4.000 |
| Difference tests | F-test | | 0.933 | 1.403 | 2.903 |
| | Sig. | | (0.446) | (0.233) | (0.022**) |
| | Chi-square | | 2.705 | 2.577 | 8.248 |
| | Sig. | | (0.608) | (0.631) | (0.083*) |

Note: Significance at: *10%; **5% and ***1% levels. Significance value are marked within (brackets),

Table 6. Correlations Matrix

| | KSQ | SDL | Motivate Learning |
|---|---|---|---|
| Learner KSQ | | 0.625*** | 0.564*** |
| Sig. | | 0.000 | 0.000 |
| SDL | 0.670*** | | 0.716*** |
| Sig. | 0.000 | | 0.000 |
| ML | 0.691*** | 0.796*** | |
| Sig. | 0.000 | 0.000 | |

Notes: Above Spearman correlation, and below Pearson correlation. Significance at: *10%; **5% and ***1% levels.

## 6. DISCUSSION & CONCLUSION

Gaps were described in this section and can be utilized for future research through this section. Furthermore, a constructive critique of structured literature review led to identify opportunities to narrow the research gap portrayed in these just-mentioned sections. As a result, two hypotheses were empirically testing, as depicted in Figure 1 of this article, using correlation analysis, followed by basic and advance descriptive analysis. Unfortunately, lack of time was encountered due to which the authors express part of this study's continuing study. However, the empirical results bare theoretical and practical implications. Form the theory point of view this study identified the research gap, and therefore its conceptual model and empirical evidenced the need of SDL and ML for learners to engage in KSQ. Future research can assess how this plays a broader significant role of learners' academic performance, in addition to how technology use expresses its importance within the context of Ahlia University's other programs outside College of Business and Finance. Practical implications this model could be adapted by HE for improvement. In addition, expanding this study's model and re-assess it to better understand what new technologies can better facilitate Ahlia University's e-learning agendas.

# REFERENCES

Aho, J. M. et al., 2015. Mentor-Guided Self-Directed Learning Affects Resident Practice. *Journal of Surgical Education,* 72(4), pp. 674-679.

Alshaikh, I. Y., Razzaque, A. & Alalawi, M., 2017. *Positive Emotion and Social Capital affect Knowledge Sharing: Case of the Public Sector of the Kingdom of Bahrain.* Coimbra, Portugal, Springer Lecture Notes in Business Information Processing volume.

Bishara, S., 2016. Creativity in unique problem-solving in mathematics and its influence on motivation for learning. *Bishara, Cogent Education,* Volume 3, pp. 1-14.

Blayone, T. J. B., Mykhailenko, O., vanOostveen, R. & Barber, W., 2018. Ready for digital learning? A mixed-methods exploration of surveyed technology competencies and authentic performance activity. *Education and Information Technologies,* Volume 23, p. 1377–1402.

Bondevik, G. T. et al., 2015. Interprofessional Workplace Learning in Primary Care: Students from Different Health Professions Work in Teams in Real-Life Settings. *International Journal of Teaching and Learning in Higher Education,* 27(2), pp. 175-182.

Çakıroğlu, Ü., Kokoç, M., Kol, E. & Turan, E., 2016. Exploring Teaching Programming Online through Web Conferencing System: The Lens of Activity Theory. *Educational Technology & Society,* 19(4), p. 126–139.

Chiu, C.-M., Hsu, M.-H. & Wang, E. T., 2006. Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decision Support Systems,* 42(3), p. 1872–1888.

Costandi, , S., Hamdan, , A., Alareeni, , B. & Hassan, , A., 2018. Educational governance and challenges to universities in Arabian Gulf Region. *Educational philosophy and theory.*

Garderen, D. v. et al., 2017. Self-Directed Learning to Improve Science Content Knowledge for Teachers. *Intervention in School and Clinic,* 52(4), p. 236–242.

Gay, G. H. E., 2016. An assessment of online instructor e-learning readiness before, during, and after course delivery. *Journal of Computer and Higher Education,* Volume 28, p. 199–220.

Hadjichambis, A. C. et al., 2016. Investigating the Effectiveness of an Inquiry-Based Intervention on Human Reproduction in Relation to Students' Gender, Prior Knowledge and Motivation for Learning in Biology. *Journal of Biological Education,* 50(3), pp. 261-274.

Hao, Y., 2016. Exploring undergraduates' perspectives and flipped learning readiness in their flipped classrooms. *Computers in Human Behavior,* Volume 59, p. 82e92.

Hung, M.-L., Chou, C., Chen, C.-H. & Own, Z.-Y., 2010. Learner readiness for online learning: Scale development and student perceptions. *Computers & Education,* Volume 55, p. 1080–1090.

Lin, H.-H., Lin, S., Yeh, C.-H. & Wang, Y.-S., 2016. Measuring mobile learning readiness: scale development and validation. *Internet Research,* 26(1), pp. 265-287.

Li, T. M. H. et al., 2016. Design and evaluation of a Facebook game for self-directed e-learning. *Knowledge Management & E-Learning,* 8(3), p. 464–480.

Rashid, T. & Asghar, H. M., 2016. Technology use, self-directed learning, student engagement and academic performance: Examining the interrelations. *Computers in Human Behavior,* Volume 63, pp. 604-612.

Rotgans, J. I. & Schmidt, H. G., 2017. The relation between individual interest and knowledge acquisition. *British Educational Research Journal,* 43(2), p. 350–371.

Tio, R. A. et al., 2016. Weak self-directed learning skills hamper performance in cumulative assessment. *Medical Teacher,* Volume 38, pp. 421-423.

Toit-Brits, C. d. & Zyl, C.-M. v., 2017. Self-directed learning characteristics: making learning personal, empowering and successful. *Africa Education Review,* 14(3-4), pp. 122-141.

van Rijn, M. B., Yang, H. & Sanders, K., 2013. Understanding employees' informal workplace learning: The joint influence of career motivation and self-construal. *Career Development International,* 18(6), pp. 610-628.

Zhang, X. & Jiang, J. Y., 2015. With whom shall I share my knowledge? A recipient perspective of knowledge sharing. *Journal of Knowledge Management,* 19(2), pp. 277-295.