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ANALYZING THE RELATIONSHIP BETWEEN TECHNOLOGY USE, STUDENT ENGAGEMENT, SELF-DIRECTED LEARNING AND ACADEMIC PERFORMANCE

Vandana Singh and Pallavi Mathur
Bhartiya Skill Development University
Jaipur, Rajasthan, India

Abstract

Students these days are intensively using media and technology. This led to change in their study habits. The aim here is to find out the impact of variety of technologies on student engagement; self-directed learning and academic performance. 343 MBA students from Jaipur, Rajasthan voluntarily participated in the survey. Data analysis has been done by applying both descriptive and inferential statistics. Pearson correlation was applied and result showed no significant association between student's academic performance and media and technology usage, although weak positive association was found with SDL. Multiple linear regression analyses revealed that technology use significantly predict engagement, Self-directed learning and academic performance. Implications were discussed based on the results.

Keywords: Student Engagement, Self-Directed Learning, Technology Use, Academic Performance.

Introduction

Usage of technology by students was once restricted to desktop and laptop computers only (L.D. Rosen et al., 2013). In order to study the relationship between media and technology usage habits and academic performance current development in technology cannot be avoided. Usage of portable technologies like tablet, I-pad, smartphones, and other devices is very common these days. Activities which were once restricted to desktop computers only are now possible on these portable technologies. Smart phones and 4G enabled portable devices has removed location and time restriction, and can be used for educational as well as leisure activities (Terry et al., 2016). There is tremendous increase in the mobile device ownership and thereby internet among young population (Anderson et al., 2017). With the universal presence of technology students or young generation are living with social networks like Instagram, Facebook, and Twitter. They comment more on social networking sites than they talk on phone. They update their status on WhatsApp often sleeping with their smartphone vibrating by their sides" (Larry D. Rosen et al., 2013). Various name has been given to this generation who has grown up with technology and had an exposure of various media and technology :, The MTV Generation, The Generation X, the Generation Y/ Millennials, Generation Z, Digital Natives ,Net Generation, and Homo Zappiens are some of these cohorts (Prensky & Berry, 2001). They are comfortable in using "any form of electronic media," "they are master multitaskers, social networkers, electronic communicators and the first to rush to any new technology" (Larry D. Rosen, 2010). Given the current scenario where young generation are living with the technology and have access to various media and technology, they are regularly using these technologies; it give rise to following questions: Is there any relationship between continuous engagement with Internet enabled devices and the academic performance? Does technology accelerate or repress academic performance? And also, does technology use contribute to the prediction of self-directed learning, student engagement and academic performance.

Background

Internet enabled devices usage and performance of students in academics

So far studies have been conducted to analyse the effect of general and specific technologies on academic performance; and variation has been found in the results. Some concluded that digital technologies leads to enhancement in learning and has changed the way in which we teach and learn Beetham & Sharpe, (2013). At the same time some studies proposed that technology should be used cautiously as it may cause distraction to students Rashid & Asghar, (2016). Lei & Zhao, (2007) found that performance of students in academics can be improved by efficiently utilizing the technology for academic purpose only. It was also concluded in the results of their study that technologies which were improving academic performance were not so popular and were less used technologies. Drain et al., (2012) proposed that better score in academic also depends on hours spent on using computers or the Internet. Suhail & Bargees, (2006) found that if students are careful while using internet and if they use it properly for academic purpose only, then it will definitely improve their reading, writing, and information processing skills and thereby increase academic performances.

In many studies no significant relationship was found between technology usage and academic performance Hunley et al., (2005). Englander et al., (2010), found that as students increased usage of Internet hours per week, their exam performances decreases, as they get distracted and do not use Internet productively for academic purpose.



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Many studies focused on association between specific technology and performance of students in academics. Hunley et al., (2005) found no significant relationship between usage of certain technologies and academic performance. At the same time Jacobsen & Forste, (2011) also concluded in his study that calling, texting and GPA are negatively related with each other.

Similar to the results of above study negative correlation was found between cell phone usage and GPA and also between texting and GPA, while anxiety was found to be positively correlated with GPA (Boumosleh & Jaalouk, 2018). Few studies also claim that if students excessively use Instant Message (IM) or if they have addiction of Instant Message (IM) their academic performance will surely decrease (Junco & Cotten, 2011). It was also claimed in the study that video game playing has significant contribution to visuospatial ability, but has negative association with academic performance (Jackson et al., 2011). Research were also conducted to find out the association between social media usage and performance of students, it was proposed that Facebook usage time and academic performance are negatively related to each other (Junco, 2012). In the similar line, study conducted by Kirschner & Karpinski, (2010) propound that Facebook users have lower levels of GPA and their number of hour spent on studies per week is less than non-Facebook users. In contrary to the above studies few studies also found positive relationship between Facebook usage and academic performance (Moghavvemi et al., 2017) while some studies do not found any significant relationship (Alwagait et al., 2015).

Self- Directed Learning

As per Malcolm S. Knowles “Self-directed learning is a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes”(Self-Directed Learning | Educational Planning, n.d.). In the 21st Century SDL is considered to be critical skills and emphasis has been given on the development of SDL skills (Rashid & Asghar, 2016). It has been stated by Barnes et al., 2007- “Net Geners need self-directed learning opportunities, interactive environments, and multiple forms of feedback, and assignment choices that use different resources to create personally meaningful learning experiences”. Students may have great opportunities if they are provided with technology- rich learning environment, they may also develop abilities to be self-directed in their learning, with this ability students became aware of resources available and also to manage and use the information appropriately (Mishra et al., 2013). The aspects of self-directed learning or the choice of what, when and how long to study provided by social media and other technologies gives positive results in user’s learning efforts (Tullis & Benjamin, 2011). In order to understand the relationship between learning and technologies, self-directed learning may prove to be very useful, and it can also help in finding the actual dynamics of learning and technologies (Candy, 2004). Although it has been agreed by the researcher that technology usage had an influence on SDL, but empirical evidences of the same are not available in the literature.

Technology and student engagement

For the last few years researchers has shown interest in the Student engagement. It is a broad term that is concerned with the interaction between the time, effort and other relevant resources invested by students intended to optimise the student experience and enhance the learning outcomes and development of students and the performance (Trowler, 2010). The time and energy students give in communication with others through academically purposeful activities is termed as student engagement (Kuh, 2001). While many researches have been conducted on engagement in the classroom and also on engagement with technology tools, not much has been done on the relationship between the two. Some research proposed that there is a correlation between depth of engagement and depth of learning. But the question arises is, does technology use contribute to student engagement? Few studies concluded that technology as an academic tool can increase student engagement (Chen et al., 2010). There are various interactive technological tools used for academic purposes, using these interactive tools one can take notes, can also participate in the discussion forum, and can access supplementary resources, software and applications which help to facilitate student-student and student-faculty interactions, which may foster engagement and self-directed learning (Williams et al., 2011). If students use information technology for academic purpose they are more likely to actively participate in academic collaboration with other students (Laird & Kuh, 2005). With the usage of technology for academic purpose a deeper connection establishes between the students, educators, and course content, such partnership confirms that if students engages with technology more, their engagement with academics also increases (Mehdinezhad, 2011). Technology provides students with the possibility of collaboration, which enable them to participate in the community of learners, as a result of which they accomplish more in the learning outcomes, as they are more engaged with the course content (Carini et al., 2006; Pike et al., 2011)

The current study

Identifying the gap through literature review the purpose here is to investigate the influence of a variety of technologies on self-directed learning, student engagement and academic performance. These days Internet enabled smart phones and other portable devices have become common, usage of these devices by students has increased dramatically (L.D. Rosen et al., 2013). As a result,



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researchers have started taking keen interest in analyzing the relationship between media and technology usage and academic performance. Two more variable student engagement and self-directed leaning were found to be interesting by researcher while analyzing this relationship. Students use various technologies at the same time, like they text on Wats app while taking online class., if usage of technology improves academic performance than instead of banning or limiting technology use, it can be used to improve the self-direction skill among students. Moreover, many researcheshave been conducted on particular type of media and technology. Few researcher also tries to find out the relationship between various technology use and academic performance (Bond & Kerres, 2018). The question is still yet unanswered that weather different media type usage helps to improve academic performance or not? This clearly gives purpose to this study, which is to explore the relationship between various media and technology usage pattern and the performance of students in academics. This quantitative study investigates the relationship between usage of various media and technology and performance of management students in academics. At the same time this study also explores how technology usage predicts student engagement, self -directed learning and academic performance. The hypotheses proposed are as follows.

Hypothesis1. Students’ involvement with media and technology as a whole and also withspecific technology are significantly related with their academic performance, student engagement and self-directed learning.

Hypothesis1a. Students’ involvement with media and technology use is significantly related with their academic performance, student engagement and self-directed learning.

Hypothesis1b Students’ involvement with specific media and technology usage is significantly related with their academic performance, student engagement and self-directed learning.

Hypothesis2 Students’ media and technology usage, would significantly predict self-directed learning, student engagement and the academic performance.

Methodology

Research design

Research is an important step once the hypotheses are framed. It is a blueprint of research which researcher has in his or her mind. With the help of research design researcher gets the direction of the study and also discusses the operational part of collecting data. It is a complete plan of action through which hypotheses will be tested. Given below is complete summary of the proposed research design:

Table 1 Summary of the research design

| Particulars | Details |
|-------------------------------|---------------------------------|
| Target Respondents | Management Students in Jaipur |
| Sample Frame Source | Management Institutes in Jaipur |
| Sampling Technique | Convenience sampling technique |
| Sample Size of Pilot study | 60 respondents |
| Sample Size of the main study | 343 respondents |
| Methods of data collection | Google form and Field schedule |

The present study is a survey study, and in these kinds of study everything is administer by investigator in order to describe characteristics, opinions, attitudes of a sample or group of population.

Contributors of the study

Convenience sampling method was used to form the sample of a study. It is a nonprobability sampling technique in which contributors willingly participate in the study. The participants were from the management colleges pursuing MBA or professional degree in management from Jaipur, India. The data were collected using both paper-based format as well as Google form during the fall semester of 2019-2020. Initially, 363 responses were received during the data collection process however, 20 cases were removed later due to missing cases and dropouts. Therefore, 343 management students finally form the population of the current study. Demographic information of the participants is provided in Table 2.

Majority of students who participated in the survey are male students (n= 189, 55.1%), while remaining are female (n= 154, 44.9%). Most students are less than 25 years of age (n= 292, 85.1 %), followed by 25 to 35 years of age (n= 50, 14.6 %). As per semester most students are from second semester (n= 136, 39.7%) followed by third semester (n=107, 31.2%). Remaining are from fourth (n=72, 21.0%) and first (n= 28, 8.2%) semester.



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Table 2
Distribution of participant by gender, age and semester of study

| Variable | Frequency | Percentage |
|--------------------|-----------|------------|
| Gender | | |
| Male | 189 | 55.1 |
| Female | 154 | 44.9 |
| Age Range | | |
| Less than 25 years | 292 | 85.1 |
| 25 to 35 years | 50 | 14.6 |
| More than 35 years | 1 | .3 |
| Semester | | |
| First | 28 | 8.2 |
| Second | 136 | 39.7 |
| Third | 107 | 31.2 |
| Fourth | 72 | 21.0 |
| Total | 343 | 100.0 |

Table 3 and Table 4 give the information on the respondent's average number of hours using a computer and the Internet per day. As per table 3, there is a variation in the average number of hours students spend on computer and on using Internet per day. Most of the participants reported that on an average they use computers for 5.0 – 6.0 hour per day (n= 108, 31.5%). Followed by students who whose computers for 0.5 – 1.5 hour per day (n= 74, 21.6%), 2.0 – 3.0 hour per day (n= 65, 19.0 %), 6.5 and above hour per day (n= 43, 12.5%) and 3.5 – 4.5 hour per day (n= 31, 9.0%). Few participants are not using computers (n=22, 6.4%).

Table 3
Average daily usage of Computers

| Variable | Time Interval | Frequency | Percentage |
|--|---------------|------------|------------|
| Average Daily hour using a computer | 0.5 – 1.5 | 74 | 21.6 |
| | 2.0 – 3.0 | 65 | 19.0 |
| | 3.5 – 4.5 | 31 | 9.0 |
| | 5.0 – 6.0 | 108 | 31.5 |
| | 6.5 and above | 43 | 12.5 |
| | NA or Other | 22 | 6.4 |
| | Total | 343 | 100 |

Table 4 provides information on average number of hours using the Internet each day. According to table 4 most of the respondent use Internet for 6.5 or more hour each day (n= 141, 41.1%), followed by those who use Internet for 5 – 6 hour each day (n=114, 33.2%). Remaining students use Internet on an average for 2 – 3 hour each day (n= 88, 25.7%).

Table 4
Average Daily Usage of the Internet

| Variable | Time Interval | Frequency | Percentage |
|--|---------------|-----------|------------|
| Average daily usage of Internet | 2-3 hour | 88 | 25.7 |
| | 5 – 6 hour | 114 | 33.2 |
| | 6.5 or more | 141 | 41.1 |
| | Total | 343 | 100 |



Instruments used and process of data collection

Questionnaire was formed using three scales. Few questions in order to collect the demographic information were also added. While giving demographic information students also reported their Grade Point Average (GPA), which was considered as measure of academic performance for the present study. The instruments used are as follows - Media and Technology Usage and Attitudes Scale (MTUAS), originally developed by (L.D. Rosen et al., 2013). Self-rating scale of self-directed learning (SRSSDL) developed by (Williamson, 2007) and Utrecht’s work engagement scale (UWES-S; (Schaufeli et al., 2006).

MTUAS scale measure frequencies of media and technology usage and attitudes. It has 60 items with 15 subscales. “Subscales can be used separately or together as they are internally reliable and externally valid” as declared by the developers of the scale (L.D. Rosen et al., 2013). In order to decrease the time of response and also the length of questionnaire the attitude scale of MTUAS was not used while framing the questionnaire. The following subscales of MTUAS were used in the present study- subscales of E-mailing, Text messaging, Smartphone usage, media sharing, Internet searching video gaming, and general social media usage. The questionnaire formed using these seven subscales has total of 18 items and are in a ten-point, Likert-type response format. The validity of the Turkish adapted MTUAS scale was measured with confirmatory factor analysis, and the results indicated good or perfect fit indices (Sabbah et al., 2019). The reliability of the MTUAS scale were measured using Cronbach alpha internal reliability coefficients, was 0.84.

To measure the self- directed learning SRSSDL (Self-rating scale of self-directed learning) developed by (Williamson, 2007) was used. It consists of 5 realms of self-direction which are as follows-: Awareness, Learning Strategies, Learning Activities, Evaluation and Interpersonal Skills. In all 19 items were used in the questionnaire from the above-mentioned realms. The response format was 5-point, Likert scale. The overall reliability of SRSSDL was 0.97.

Student engagement was measured using Utrecht’s work engagement scale (UWES-S; (Schaufeli et al., 2006). In all the scale has 9 items which measure Vigor, Absorption and Dedication using seven points, Likert-type response formats. In the dataset the reliability of the UWES was a 0.91.

Data Analysis

Data analysis was performed with IBM SPSS version 24. Analysis was done using both descriptive statistics as well as inferential statistics. Pearson correlation and multiple linear regression analysis were applied to test the first and second hypothesis respectively. Before conducting the above-mentioned statistical test, few assumptions are required to be checked and assumptions of the tests were met as shown from the results.

Results

Table 5 present below gives descriptive statistics about the students’ usage of different kinds of media and technology, engagement of students and self-directed learning.

Table 5
Descriptive statistics of students’ levels of media and technology, student engagement, self-directed learning and academic performance

| Variable | M | S.D |
|-------------------------|------|------|
| Academic Performance | 1.76 | .492 |
| MTUAS | 6.32 | 1.07 |
| Internet Searching | 6.57 | 1.45 |
| Media Sharing | 5.72 | 2.09 |
| Smartphone | 6.95 | 1.50 |
| Text Messaging | 6.49 | 1.38 |
| E-mailing | 6.69 | 1.29 |
| Video Gaming | 5.10 | 2.43 |
| General social Media | 5.98 | 1.87 |
| Self- Directed Learning | 2.10 | .50 |
| Student Engagement | 3.46 | .70 |



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As per the results, the students' level for different kinds of media and technology usage has a mean score of 6.32 and standard deviation of 1.07. The highest mean score belongs to Smartphone (M=6.95, SD= 1.50), followed by E-mailing (M=6.69, SD=1.29), then Internet searching (M=6.57, SD=1.45), Text messaging (M=6.49, SD=1.38), General Social Media (M=5.98, SD=1.87), Media Sharing (M=5.72, SD=2.09). The lowest mean scores belong to self-directed learning (M=2.10, SD= .50) and then the student engagement (M=3.46, SD=.70).

Two Pearson correlation tests were conducted to test the first hypothesis. Results of Hypothesis 1a and for Hypothesis 1b are shown in Table 6 and Table 7 respectively. As depicted in Table 6, negative insignificant relationship was found between technology use and the academic performance. Although weak significant positive association was found between Students' academic performances (GPA) and self-directed learning (r=0.132, p < .05) and no significant correlation was found with the student engagement.

Table 7 depicts the results of Hypothesis 1b shows that there is no significant relationship between the subscales of technology and academic performance. Weak significant positive association was found between video gaming and SDL (r= .131, p<0.05) and also between Smartphone usage and student engagement (r = .145, p < 0.01). The findings also indicated a statistically significant strong association between Smartphone usage and Internet searching (r=0.559, p<.01), media sharing and video gaming (r=0.566, p<.01), and also with general social media (r=0.477, p<.01). Strong significant positive association was also found between general social media and video gaming (r = .501, p < .01).

Table 6
Result of Pearson correlation

Table with 5 columns and 5 rows showing Pearson correlation results between Academic Performance (1), Student Engagement (2), Self-directed Learning (3), and Media and technology Usage (4).

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Table 7
Pearson correlation result of academic performance and media and technology usage sub factors, student engagement, self- directed learning.

Table with 11 columns and 11 rows showing Pearson correlation results between Academic Performance (1), E- Mailing (2), Text Messaging (3), Smartphone Usage (4), Media Sharing (5), Internet Searching (6), Video Gaming (7), General social media (8), Student engagement (9), and Self-directed learning (10).

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).



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In order to test Hypothesis 2, three separate multiple regression were performed to predict student engagement, self-direction and academic performance from 7 media and technology variables (MTUAS); E-mail, text messaging, Smartphone usage, media sharing, Internet searching, video gaming, General social media. Technology use significantly predicted engagement ($F(7, 335) = 8.431, P < 0.001, R^2 = 0.15, \text{Adjusted } R^2 = 0.13$), Self-directed learning ($F(7, 335) = 5.384, P < 0.001, R^2 = 0.10, \text{Adjusted } R^2 = 0.08$) and academic performance ($F(7, 335) = .895, P < 0.001, R^2 = .018, \text{Adjusted } R^2 = .002$). The summary regression analysis is presented in table 8.

Table 8

Linear model predictors and 95% confidence intervals of student engagement, self-directed learning and achievement.

| Engagement | Self-directed Learning | | | | Academic Performance | | | | | | | |
|----------------------|------------------------|------|---------|----------------|----------------------|------|---------|----------------|--------|------|-------|----------------|
| | b | SE B | β | 95% CI for B | b | SE B | β | 95% CI for B | | | | |
| Technology use | 3.48 | 0.24 | - | [3.00, 3.96] | 2.602 | 0.18 | - | [2.24, 2.95] | 1.87 | 0.18 | - | [1.509, 2.233] |
| Constant | 0.00 | 0.03 | 0.00 | [-0.05, 0.06] | -0.03 | 0.02 | -0.07 | [-0.07, 0.01] | 0.01 | 0.02 | 0.02 | [-0.03, 0.05] |
| E-mail | -0.02 | 0.02 | -0.03 | [-0.07, 0.03] | 0.00 | 0.02 | 0.02 | [-0.03, 0.04] | -0.02 | 0.02 | -0.07 | [-0.06, 0.01] |
| Text messaging | 0.08 | 0.03 | 0.18 | [0.02, 0.14] | -0.05 | 0.02 | -0.17 | [-0.10, -0.01] | -0.01 | 0.02 | -0.05 | [-0.06, 0.02] |
| Smartphone Usage | -0.06 | 0.02 | -0.19 | [-0.11, -0.02] | 0.03 | 0.17 | 0.13 | [0.00, 0.06] | -0.01 | 0.17 | -0.06 | [-0.04, 0.01] |
| Media Sharing | 0.04 | 0.03 | 0.08 | [-0.02, 0.10] | -0.05 | 0.02 | -0.15 | [-0.10, -0.00] | 0.003 | 0.02 | 0.10 | [-0.04, 0.05] |
| Internet Searching | -0.06 | 0.01 | -0.21 | [-0.10, -0.02] | 0.06 | 0.01 | 0.09 | [-0.00, 0.04] | -0.003 | 0.01 | -0.01 | [-0.03, 0.02] |
| Video Gaming | -0.01 | 0.02 | -0.02 | [-0.05, 0.03] | 0.02 | 0.01 | 0.07 | [-0.01, 0.05] | 0.03 | 0.01 | 0.11 | [-0.004, 0.06] |
| General Social media | | | | | | | | | | | | |

Discussion and conclusion

The aim of the present study is to find out the association between media and technology usage of management students and academic performance, student engagement and self-directed learning. It was found that most used technologies were Smartphone followed by E-mailing, Internet searching, Text messaging, General social media and Media sharing respectively. The findings of this study are similar to (Hampton et al., 2011) and (Larry D. Rosen et al., 2013). As far as first hypothesis is concerned, results concluded a negative insignificant relationship between academic performance and media and technology usage and also with student engagement. These results are supported by the findings of (Uzun & Kilis, 2019) which concluded that heavy media usage leads to lower level of academic performance.

About the sub-scales of media and technology usage, academic performance was insignificantly and negatively associated with Smartphone Usage, General Social Media Usage, emailing, Media Sharing, Video gaming and Internet searching. It can be consider from the non-significant and negative results regarding subscales of technology, that students lacks necessary productive skills to use these technology in a way that improve their academic performance(Dunn & Kennedy, 2019).Educators should consider



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this finding and should stress more on efficient use of technology for academic purposes. The purpose behind second hypothesis was to find out how significantly, technology usage predicts self-directed learning, student engagement and academic performance. To test this hypothesis three separate multiple regressions were performed. The findings indicated that technology use significantly predicted engagement, self-directed learning and academic performance.

It could be concluded from the results of this study that it is very important to empirically test the model of technology use before implementing and incorporated it in academic environment and also in pedagogical strategies. And also, by this way one can not only eliminate the negative outcome but also may improve academic performance, student engagement and self-directed learning. Evidences are available from the previous studies which proposed that ‘technology integrations are fairly influential on increasing student engagement’ (Hancock & Betts, 2002). Integrating technology into academics and also in the learning process brings lots of benefits to the students: they receive knowledge and become active and engaged learner and at the same time become more responsible for their own education.

Conclusion

Around the world educational institutions are trying to find out ways to efficiently use technology to enhance learning and engagement of students and also how to incorporate self-directed learning or lifelong skills among students. This multivariable study will contribute to the prevailing literature by investigating the interrelationship among a set of variables of academic behaviors central to today’s educational settings: technology use, student engagement and self-directed learning and academic performance. The results are deliberated from the perspective of supposition based in the prevailing literature and it is critical to endorse that fresh constructs should be examined to explore technology use facilitate a better understanding on how it can be used as efficient learning tool to augment academic achievement juxtaposition with the advancement of student engagement and upgrade self-directed learning among today’s technology driven generation of students.

References

- Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV- infected patients. *N Engl J Med.* 2002; 347: 284-287
- Alwagait, E., Shahzad, B., & Alim, S. (2015). Impact of social media usage on students’ academic performance in Saudi Arabia. *Computers in Human Behavior, 51,* 1092–1097.
- Anderson, E. L., Steen, E., & Stavropoulos, V. (2017). Internet use and Problematic Internet Use: A systematic review of longitudinal research trends in adolescence and emergent adulthood. *International Journal of Adolescence and Youth, 22(4),* 430–454. <https://doi.org/10.1080/02673843.2016.1227716>
- Barnes, K., Marateo, R. C., & Ferris, S. P. (2007). Teaching and learning with the net generation. *Innovate: Journal of Online Education, 3(4).*
- Beetham, H., & Sharpe, R. (2013). An introduction to rethinking pedagogy. *Rethinking Pedagogy for a Digital Age: Designing for 21st Century Learning, 41–61.*
- Bond, M., & Kerres, M. (2018). Systematic Reviews in Educational Technology Research: Potential and pitfalls. *EdMedia.*
- Boumosleh, J., & Jaalouk, D. (2018). Smartphone addiction among university students and its relationship with academic performance. *Global Journal of Health Science, 10(1),* 48–59.
- Candy, P. C. (2004). Linking thinking: Self-directed learning in the digital age. Department of Education, Science and Training Canberra, Australia.
- Carini, R. M., Kuh, G. D., & Klein, S. P. (2006). Student engagement and student learning: Testing the linkages. *Research in Higher Education, 47(1),* 1–32.
- Chen, P.-S. D., Lambert, A. D., & Guidry, K. R. (2010). Engaging online learners: The impact of Web-based learning technology on college student engagement. *Computers & Education, 54(4),* 1222–1232.
- Drain, T. S., Grier, L. E., & Sun, W. (2012). Is the growing use of electronic devices beneficial to academic performance? Results from archival data and a survey. *Issues in Information Systems, 13(1),* 225–231.
- Dunn, T. J., & Kennedy, M. (2019). Technology Enhanced Learning in higher education; motivations, engagement and academic achievement. *Computers & Education, 137,* 104–113.
- Englander, F., Terregrossa, R. A., & Wang, Z. (2010). Internet use among college students: Tool or toy? *Educational Review, 62(1),* 85–96.
- Hampton, K. N., Goulet, L. S., Rainie, L., & Purcell, K. (2011). *Social networking sites and our lives (Vol. 1).* Pew Internet & American Life Project Washington, DC.
- Hancock, V., & Betts, F. (2002). Back to the future preparing learners for academic success in 2004. *Learning and Leading with Technology, 29(7),* 10–13.
- Hunley, S. A., Krise, J., Rich, T., & Schell, C. (2005). ADOLESCENT COMPUTER USE. *Adolescence, 40(158).*



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- Jackson, L. A., Von Eye, A., Witt, E. A., Zhao, Y., & Fitzgerald, H. E. (2011). A longitudinal study of the effects of Internet use and videogame playing on academic performance and the roles of gender, race and income in these relationships. *Computers in Human Behavior*, 27(1), 228–239.
- Jacobsen, W. C., & Forste, R. (2011). The wired generation: Academic and social outcomes of electronic media use among university students. *Cyberpsychology, Behavior, and Social Networking*, 14(5), 275–280.
- Junco, R. (2012). The relationship between frequency of Facebook use, participation in Facebook activities, and student engagement. *Computers & Education*, 58(1), 162–171.
- Junco, R., & Cotten, S. R. (2011). Perceived academic effects of instant messaging use. *Computers & Education*, 56(2), 370–378.
- Kirschner, P. A., & Karpinski, A. C. (2010). Facebook® and academic performance. *Computers in Human Behavior*, 26(6), 1237–1245.
- Kuh, G. D. (2001). Assessing what really matters to student learning inside the national survey of student engagement. *Change: The Magazine of Higher Learning*, 33(3), 10–17.
- Laird, T. F. N., & Kuh, G. D. (2005). Student experiences with information technology and their relationship to other aspects of student engagement. *Research in Higher Education*, 46(2), 211–233.
- Lei, J., & Zhao, Y. (2007). Technology uses and student achievement: A longitudinal study. *Computers & Education*, 49(2), 284–296.
- Mehdinezhad, V. (2011). First Year Students' Engagement at the University. *International Online Journal of Educational Sciences*, 3(1).
- Mishra, P., Fahnoe, C., Henriksen, D., & Group, D.-P. R. (2013). Creativity, self-directed learning and the architecture of technology rich environments. *TechTrends*, 57(1), 10–13.
- Moghavvemi, S., Sulaiman, A., Aziz, A. A., & Wai, P. S. (2017). The impact of Facebook usage on academic performance. 2017 International Conference on Research and Innovation in Information Systems (ICRIIS), 1–5.
- Pike, G. R., Kuh, G. D., & McCormick, A. C. (2011). An investigation of the contingent relationships between learning community participation and student engagement. *Research in Higher Education*, 52(3), 300–322.
- Prensky, M., & Berry, B. D. (2001). Do they really think differently? *On the Horizon*, 9(6), 1–9.
- Rashid, T., & Asghar, H. M. (2016). Technology use, self-directed learning, student engagement and academic performance: Examining the interrelations. *Computers in Human Behavior*, 63, 604–612. <https://doi.org/10.1016/j.chb.2016.05.084>
- Rosen, Larry D. (2010). *Rewired: Understanding the iGeneration and the way they learn*. St. Martin's Press.
- Rosen, Larry D., Mark Carrier, L., & Cheever, N. A. (2013). Facebook and texting made me do it: Media-induced task-switching while studying. *Computers in Human Behavior*, 29(3), 948–958. <https://doi.org/10.1016/j.chb.2012.12.001>
- Rosen, L.D., Whaling, K., Carrier, L. M., Cheever, N. A., & Rökkum, J. (2013). The Media and Technology Usage and Attitudes Scale: An empirical investigation. *Computers in Human Behavior*, 29(6), 2501–2511. <https://doi.org/10.1016/j.chb.2013.06.006>
- Sabbah, H., Khamis, R., Zorkot, D., Sabbah, S., Droubi, N., & Sabbah, I. (2019). The social media and technology addiction and its associated factors among university students in Lebanon using the Media and Technology Usage and Attitudes Scale (MTUAS). *Journal of Computer and Communications*, 7(11), 88–106.
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 25(3), 293–315.
- Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, 66(4), 701–716.
- Self-Directed Learning | Educational Planning. (n.d.). Retrieved March 30, 2021, from <https://courses.lumenlearning.com/suny-esc-educationalplanning/chapter/self-directed-learning/>
- Suhail, K., & Bargees, Z. (2006). Effects of excessive Internet use on undergraduate students in Pakistan. *CyberPsychology & Behavior*, 9(3), 297–307.
- Terry, C. A., Mishra, P., & Roseth, C. J. (2016). Preference for multitasking, technological dependency, student metacognition, & pervasive technology use: An experimental intervention. *Computers in Human Behavior*, 65, 241–251. <https://doi.org/10.1016/j.chb.2016.08.009>
- Trowler, V. (2010). Student engagement literature review. *The Higher Education Academy*, 11(1), 1–15.
- Tullis, J. G., & Benjamin, A. S. (2011). On the effectiveness of self-paced learning. *Journal of Memory and Language*, 64(2), 109–118.
- Uzun, A. M., & Kilis, S. (2019). Does persistent involvement in media and technology lead to lower academic performance? Evaluating media and technology use in relation to multitasking, self-regulation and academic performance. *Computers in Human Behavior*, 90, 196–203.
- Williams, R., Karousou, R., & Mackness, J. (2011). Emergent learning and learning ecologies in Web 2.0. *International Review of Research in Open and Distributed Learning*, 12(3), 39–59.
- Williamson, S. N. (2007). Development of a self-rating scale of self-directed learning. *Nurse Researcher*, 14(2).

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