

## The Effect of Digital Literacy on the Academic Performance of Islamic University Students in Gaza During COVID-19

تأثير محو الأمية الرقمية على الأداء الأكاديمي لطلبة الجامعة الإسلامية بغزة خلال أزمة كوفيد-19

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### Abstract

The study aims to investigate the impact of digital literacy in higher education on the academic performance of students at the Islamic University of Gaza. To achieve this objective, the study adopted the descriptive analytical approach, where a questionnaire was designed to collect data from students of the Islamic University of Gaza in various disciplines. A simple random sample was used in the study, (376) questionnaires were distributed while (303) were retrieved which were used in the study and analyzed with a recovery rate of 80%. Findings indicate that there is a significant relationship between digital literacy in education and its three levels with the academic performance of students at the Islamic University. With regard to the three levels of digital literacy, it was concluded that there is a statistically significant effect of digital usage and digital transformation on students' academic performance, while there is no statistically significant effect of digital competence on their academic performance.  
**Keywords:** Digital Literacy, digital competence, digital usage, digital transformation, academic performance, higher education, COVID-19.

### ملخص

تهدف الدراسة إلى التعرف على أثر محو الأمية الرقمية في التعليم العالي على الأداء الأكاديمي لطلبة الجامعة الإسلامية بغزة. ولتحقيق هذا الهدف اعتمدت الدراسة المنهج الوصفي التحليلي، حيث تم تصميم استبانة لجمع البيانات من طلبة الجامعة الإسلامية بغزة في مختلف التخصصات. تم استخدام عينة عشوائية بسيطة في الدراسة، حيث تم توزيع (376) استبانة، في حين تم استرجاع (303) استبانة استخدمت في الدراسة وتم تحليلها بنسبة استرداد بلغت (80%). وتشير النتائج إلى وجود علاقة ذات دلالة إحصائية بين محو الأمية الرقمية في التعليم العالي بمستوياته الثلاثة والأداء الأكاديمي لطلبة الجامعة الإسلامية. وفيما يتعلق بمستويات محو الأمية الرقمية الثلاثة، فقد تم التوصل إلى أن هناك تأثير ذو دلالة إحصائية للاستخدام الرقمي والتحول الرقمي على الأداء الأكاديمي للطلاب، في حين لا يوجد تأثير ذو دلالة إحصائية للكفاءة الرقمية على أدائهم الأكاديمي.

الكلمات المفتاحية: محو الأمية الرقمية، الكفاءة الرقمية، الاستخدام الرقمي، التحول الرقمي، الأداء الأكاديمي، التعليم العالي، كوفيد-19.

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## 1. INTRODUCTION

With the remarkable technological developments in the current era and the increasing use of the Internet, social networks and digital platforms , whether at work, study, or other aspects that require achievement through Internet networks, especially after the emergence of the Corona pandemic , which changed the life- system we used to and forced people to Sitting at home and performing their work and study remotely (Tzifopoulos, 2020), the need to know and understand the concept of digital literacy, its importance and levels has become a necessity.

Many researchers such as (Korlat et al., 2021; Leite & Monteiro, 2021; Matli & Ngoepe, 2020; Silvana, Damayani, Sjuhro & Utari, 2020) have talked about digital literacy, either in educational environment or for those who are seeking jobs, it can be said that they in general focus on levels of abilities and how digital technologies are used in order to accomplish tasks and achieve the targeted objectives and goals in addition to the perceptions and digital skills developments.

Artacho et al., (2020); Çebi & Reisoglu, (2020); Mirete, Maquilón, Mirete & Rodríguez, (2020) focused on the first level of digital literacy which is “digital competence”. Ferrari, (2012) illustrated the concept of digital competence as an individuals` ability to understand the media, look for information using internet and the ability to collaborate and communicate with other individuals using different digital technologies and tools in addition to the knowledge of the individual in how to efficiently, creatively and ethically perform their daily tasks and transactions based on internet network. Whereas Carstens, Mallon, Bataineh & Al-Bataineh, (2021); Zeynivandnezhad, (2020); Papouli, Chatzifotiou & Tsairidis, (2020) dealt with the second level “digital usage” which is defined by Martin & Grudziecki, (2006) as the extent of the individual's ability to use his digital competencies to complete the work and tasks required using digital platforms and Internet. Finally, the “digital transformation” level which is illustrated by Kozarkiewicz, (2020); Mergel, Edelman & Haug, (2019). Kozarkiewicz, (2020) defined this concept as it “is a process in which digital technologies play a central role both in creating and strengthening disruptive changes taking place in industry (sector) and in society”.

In this study, these three levels will be reviewed in some detail concerning higher education, counting the applied study of students at the Islamic University of Gaza, because of their importance in knowing to which extent students have digital skills, in which extensive digital

technology is used in their classes and the impact of these digital literacy levels on students` academic performance.

## **2. Literature Review and Hypothesis Development**

### **2.1 Digital Literacies in higher education**

There is no doubt that change is essential in life, and without change, societies would not have advanced and human beings would not have reached this stage of scientific and technological progress. In this era and specifically after the emergence of the Corona pandemic, Humans were forced to change urgently and find technological alternatives that help them perform tasks remotely without face to face meetings for fear of the virus, which is why organizations began to use or intensify the use of digital technology so that they can perform their work as usual , for instance, Universities and Schools have adopted e-learning for many classes, that is an important indicator of the great transformation that is taking place in the world and organizations in particular, whether by studying, teaching or performing daily tasks and transactions (Tzifopoulos, 2020; Alkaldi et al., 2019). Hence the importance of shedding light on the concept of digital literacy, It`s dimensions and levels in order to increase knowledge and awareness of this concept among people in this era and to increase their digital literacy level (Eshet-Alkalai, 2004; Martin & Grudziecki, 2006).

### **2.2 Digital Literacy concept and levels**

Berkowsky & Czaja, (2018) defined digital literacy as “(broadly speaking) refers to the skills and knowledge associated with successful use of ICTs, including laptops and desktop computers, smartphones, and tablet computers”. After reviewing many authors` definitions, it is concluded that digital literacy is “what the individual holds of knowledge, skills and abilities that enable him to understand, access and evaluate information using digital tools and platforms in order to perform his tasks and share knowledge faster and better”.

Davies & Roberts,(2013) stated that individuals should have superb digital skills because 90% of new jobs will require employees with high level of digital skills, in addition if gradulators want to develop themselves to get jobs they absolutely should think about improving their digital literacy. Whereas Poore, (2011) emphasized the importance of having a collective digital literacy in order to achieve the collective intelligence. In addition, digital literacy considered a key factor in all aspects of life either in work or education (Martin & Grudziecki,2006). Moreover, digital literacies are good opportunities for both students and employees because students with high digital literacy level can get higher job opportunities to be good competitors in the market and good for employees as they can get higher position or

salary according to their skills (Leite & Monteiro, 2021; Mishra et al., 2017; Alkaldi et al., 2019).

### 2.2.1 Digital competence

Illomäki, Paavola, Lakkala & Kantosalo, (2016) defined digital competence as “consisting of (1) technical competence, (2) the ability to use digital technologies in a meaningful way for working, studying and in everyday life, (3) the ability to evaluate digital technologies critically, and (4) motivation to participate and commit in the digital culture.” Whereas The Council of the European Union, (2018) explained the concept as “Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.”

The result of Limniou, Varga-Atkins, Hands & Elshamaa, (2021), showed that students had the required digital capabilities in order to be comfortable with both technologies and their capabilities level to cope with and foster new technologies essential for learning purposes. Regarding the qualitative responses of technology usage influence and students` digital capabilities during lock down duration, some felt confused by the speed and suspicion of their personal and educational life during covid-19, they faced difficulties in continuing their studies. On the other hand, students who have high level of self -regulation and digital abilities were able to keep their focus and participation. Based on the foregoing, the following hypothesis was concluded:

**H1: There’s a statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) of Digital Competence on academic performance.**

### 2.2.2 Digital usage

Many researchers such as Martin & Grudziecki, (2006); Switzer & Csapo, (2005) stated the concept of the using digital technology, there is a great importance of achieving educating and work objectives and goals through a useful and suitable use of digital technologies (Martin & Grudziecki, 2006). In addition , it is very important to teach student how to use digital technologies and devices that lead to higher learning motivation for them when an appropriate and good tools that help them share knowledge exist (Switzer & Csapo, 2005).

According to Martin & Grudziecki, (2006) “Digital usage” is considered the middle level that lies between digital competence and digital

transformation, which is defined as “the application of digital competence within specific professional or domain contexts”. While Dienlin & Johannes, (2020) described the concept of the use of digital technology as “an umbrella that encompasses various devices, services, and types of use”. As a result of corona pandemic which forced students to stay at home and follow e-learning system, the use of technology helps in many ways including educating safely, engage students in the online courses to acquire new technological skills, provide them with new e-learning methods and make them part of virtual learning so that they are able to deal with digital tools, contents and platforms. (Vargo, Zhu, Benwell & Yan, 2021). Based on the above, we conclude the following hypothesis:

**H2: There’s a statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) of Digital Usage on academic performance.**

### 2.2.3 Digital transformation

Gebayew, Hardini, Panjaitan, Kurniawan & Suhardi, (2018) defined digital transformation as “the integration of digital technology into all sectors of a business, fundamentally altering how you perform and bring value to customers” while Kozarkiewicz, (2020) explained it as “a process in which digital technologies play a central role both in creating and strengthening disruptive changes taking place in industry (sector) and in society”.

Digital transformation rely on different effects of digital technologies applications on both economic and new products sides (Pousttchi, Gleiss, Buzzi & Kohlhagen, 2019). In addition, digital transformation can affect all people and nearly in all fields of activities, as it contains both digital technology and innovation (Kozarkiewicz, 2020). Digital world is facing diverse digital technologies progression which have a direct effect for the behaviors of customers, in addition, businesses are relying on different digital technologies and having platforms of technology can help organizations in creativity and innovations (Shrivastava, 2017). Whereas, Osmundsen, Iden & Bygstad, (2018) emphasized that high digital technology usage have changed the way of executing businesses and the way of competing with rivals, interacting and customers expectation and satisfaction. The hypothesis :

**H3: There’s a statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) of Digital Transformation on academic performance.**

### 2.3 Digital Literacy and Academic Performance

Nowadays, more different skills are required from individuals which should be used to both increasing their abilities in using information for

their personal purposes and to deal with the digital media risks that they may face, so that digital literacy assists in making a responsible decisions, sharing resources and knowledge with others, finding the reliable contents and materials, the optimal utilization of digital tools such as images and etc (Feola, 2016).Whereas Coccoli, Guercio, Maresca & Stanganelli, (2014) stated that digital technology is changing students` knowledge obtaining and how they learn.

Techataweewan & Prasertsin, (2018) outlined that incorporating and integrating students with technologies and the skills they obtain that support their learning and their work readiness are affected by internet networks and digital transformation, also, digital literacy has a good and positive impact on the skills that are considered important for effective students` learning. According to Holley, (2002) , University students who engage in virtual courses using different technological tools such as boards and learn through online lectures gained higher grades than those who study in a traditional learning environment.

Yustika & Iswati, (2020) stated that the high digital literacy level had a positive impact on the high learning achievements and outcomes to the students` academic performance. While Techataweewan & Prasertsin, (2018) mentioned that poor academic performance and low job opportunities may be a result of a weak students` digital literacy, students will obtain both knowledge and technological competencies in order to do their work in an effective way.

Perdana, Yani, Jumadi & Rosana, (2019), stated that, there is a significance difference of the skills of digital literacy among different classes levels, so that these skills are affected by educational level and in order to improve the digital literacy skills for students, different digital tools and devices should be included in learning process. The hypothesis as follows:

**H4: There's a statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) of digital literacies on academic performance.**

### **3. Research methodology**

In order to answer the research question, the study adopts descriptive analytical approach and the survey is being used for primary data collection purposes. a questionnaire tool was developed and prepared for the study. The scientist relies upon the survey and uses the principal program Statistical Package for the Social Sciences (SPSS 28).

### 3.1 Data sources:

The study is primarily based on primary data. The primary data were collected with the help questionnaire model. The questionnaire was adopted on Digital literacies in higher education and its impact on students' academic performance during COVID-19- An applied study on Islamic University students in Gaza.

### 3.2 Study Population and Sample

**3.2.1 Population:** The study population consists of Islamic University students from all disciplines and faculties. According to the university's admission and registration information (2022), the number of students at the Islamic University of Gaza is 17,000.

**3.2.2 Sample size:** A simple random sample was used in the research and according to PC calculations, a sample of (376) students were involved. Both electronic and paper questionnaires were distributed among them. But only (303) questionnaires were retrieved and valid for the analysis, with a recovery rate of 80%.

## 4. Results related to digital literacies

Table (1): Correlation coefficient between Digital literacies and academic performance

Digital literacies	Pearson Correlation Coefficient	P-Value (Sig.)
Digital competence	0.551**	0.000
Digital usage	0.647**	0.000
Digital transformation	0.679**	0.000
academic performance	0.689**	0.000

\* Correlation is significant at the 0.05 level

Table (2): Result of multiple linear regression analysis

Variable	B	T	Sig.	R	R-Square	F	Sig.
(Constant)	0.594	3.310	0.001	0.730	0.532	113.484	0.000
Digital competence	0.136	1.949	0.052				
Digital usage	0.306	4.712	0.000				
Digital transformation	0.404	7.655	0.000				

\* The variable is statistically significant at 0.05 level

#### 4.1 Digital competence

Table (1 and 2) shows that the correlation coefficient between Digital competence and academic performance equals 0.551 and the p-value (Sig.) equals 0.000. The p-value (Sig.) is less than 0.05, so the correlation coefficient is statistically significant at  $\alpha = 0.05$ . We conclude there exists a significant relevance between Digital competence and academic performance. So, there's a statistically significant relationship at the level of significance ( $\alpha \leq 0.05$ ) between Digital Competence and academic performance”.

To the variable " Digital competence ", the t-test =1.949, the P-value (Sig.) is more than 0.05, hence, this variable is statistically insignificant. Then there's insignificant effect of the variable Digital competence on academic performance. This is attributed to the reason that having digital competence and the ability to use digital tools and technologies, share information via the Internet, and their knowledge of social networking sites does not mean that students will use these skills in learning and study. Users often like to use digital technologies and the Internet to chat with their friends, play games & etc. So, we reject the hypothesis 1 : “There's a statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) of digital competence on academic performance”.

#### 4.2 Digital usage

Table (1 and 2) represents that the correlation coefficient between Digital usage and academic performance equals 0.647 and the p-value (Sig.) equals 0.000. The p-value (Sig.) is less than 0.05, so the correlation coefficient is statistically significant at  $\alpha = 0.05$ . We conclude there exists a significant relevance between Digital usage and academic performance. So, there's a statistically significant relationship at the level of significance ( $\alpha \leq 0.05$ ) between Digital usage and academic performance”.

To the variable " Digital usage ", the t-test =4.712, the P-value (Sig.) less than 0.05, hence this variable is statistically significant. Since the sign of the test is positive, then there's significant positive effect of the variable Digital usage on academic performance. This is attributed to the reason that when students apply their digital knowledge, skills and competencies in addition to their use of various digital tools and devices for the purpose of learning, increasing their knowledge and raising the level of their academic performance by searching for information related to their studies and sharing it with their colleagues, it will eventually lead to positively affecting their educational level and increasing their academic performance. So, we

accept the hypothesis 2: “There’s a statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) of digital usage on academic performance”

#### 4.3 Digital transformation

Table (1 and 2) clarifies that the correlation coefficient between Digital transformation and academic performance equals 0.679 and the p-value (Sig.) equals 0.000. The p-value (Sig.) is less than 0.05, so the correlation coefficient is statistically significant at  $\alpha = 0.05$ . We conclude there exists a significant relevance between Digital transformation and academic performance. So, there’s a statistically significant relationship at the level of significance ( $\alpha \leq 0.05$ ) between Digital transformation and academic performance”.

To the variable " Digital transformation ", the t-test =7.655, the P-value (Sig.) but 0.05, hence this variable is statistically significant. Since the sign of the test is positive, then there’s significant positive effect of the variable Digital transformation on academic performance. This is attributed to the reason that using digital technologies and allowing the use of smartphones and other digital devices during the classroom and lectures will make students interested in focusing on the information they want to collect, how to develop and present content and moving away from the boring tools of presenting and sharing information such as literally transfer what teachers write on the board without feeling the importance of research, development and improvement. So, we accept the hypothesis 3: “There’s a statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) of digital transformation on academic performance”.

#### 5. Conclusions related to academic performance

Table (1) shows that the correlation coefficient between Digital literacies and academic performance equals 0.689 and the p-value (Sig.) equals 0.000. The p-value (Sig.) is less than 0.05, so the correlation coefficient is statistically significant at  $\alpha = 0.05$ . We conclude there exists a significant relevance between Digital literacies and academic performance.

The results support the study of (Leite & Monteiro, 2021) that students need to develop their digital skills independently in order to attend higher education and participate in the activities and that digital transformation attached to the innovation and should use it in a critical way to avoid any drawbacks for digital transformation process. Also, (Silvana et al., 2020) that showed it is important to motivate others in order to evaluate the activities of the programs of digital literacy that relates to being aware of media benefits. Also, in the study of (Mishra et al., 2017) students in the

classes feel comfortable when using digital technologies and in different courses, they teach themselves how to use digital tools and devices in addition to that they wish that computers in the college have more software packages.

Table (2) represents that the Multiple correlation coefficient  $R = 0.730$  and  $R\text{-Square} = 0.532$ : This means 53.2% of the variation in academic performance is explained by all of the independent variables together " Digital competence, Digital usage, Digital transformation". The Analysis of Variance for the regression model.  $F=113.484$ , P-value (Sig.) is less than 0.05, so there is a significant relevance between Digital literacies and academic performance and the independent variables " Digital competence, Digital usage, Digital transformation ".

This result is in line with the study of (Mirete et al., 2020) where there is a negative relation between teaching approach that focus on just information transmission and information and communication technology usage. Also, (Rafi, JianMing & Ahmad, 2019) represented that when there is a technological contribution in the academic libraries this help students in developing their technological learning skills.

## 6. Conclusions related to hypothesis testing

- a) It is concluded that there is a strong relationship between digital literacies and its three levels (digital competence, digital usage and digital transformation) and students` academic level.
- b) Conclusions related to the impact at the level of significance ( $\alpha \leq 0.05$ ) of digital literacies on students` academic performance.
  - There is a significance relation between digital literacies and academic performance and the three independent variables (digital competence, digital usage, digital transformation).
  - There is insignificant effect of "digital competence" on academic performance.
  - There is significant positive effect of "digital usage" and "digital transformation" on academic performance.

## 7. Conclusions related to the differences due to demographic characteristics

- There is insignificant difference among males and female respondents in the Islamic University of Gaza toward the impact of digital literacies on students` academic performance.

- There is insignificant difference according to the age of students in the Islamic University of Gaza toward the impact of digital literacies on students` academic performance.
- There is insignificant difference regarding the academic level of respondents in the Islamic University of Gaza toward the impact of digital literacies on students` academic performance.
- There is insignificant difference regarding GPA of respondents in the Islamic University of Gaza toward the impact of digital literacies on students` academic performance.
- There is insignificant difference according to the faculty in the Islamic University of Gaza toward the impact of digital literacies on students` academic performance

## 8. General recommendations

- University should identify “digital literacy” as a concept and clarify its importance and benefits to the students through conferences, workshops, etc.
- Organize training courses to both teachers and students in order to easily deal with digital tools and devices, in addition to improve their knowledge and skills regarding digital technology.
- Organize workshops to increase the awareness of digital technology and rules related to digital devices and tools usage.
- Start to involve digital tools and technologies in lectures as possible.

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