The Effect of WhatsApp Application on Saudi Electronic University Students' and the Role of Student Engagement on Academic Performance

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Abstract: **Digital applications have enhanced the educational experience and students performing. This paper discussed the effect of WhatsApp application on students engagement and its role on academic performance. The research addressed five hypotheses to determine the role of WhatsApp usage on student engagement. The paper also considered some influential factors that are affected using WhatsApp, including major. The intended research method the study would take was the quantitative approach using the survey to collect the data from the students. It aimed to understand the effect of major on the use of WhatsApp on student engagement and then students' academic performance. The findings of this study would specifically participate in enhancing students engagement and their educational experiences. It would also provide educators with the importance use of technology to implement it in their teaching styles and learning process.**

Keywords: **Student Engagement; Academic Performance; WhatsApp; Saudi Students; Saudi Electronic University.**

1. INTRODUCTION

WhatsApp Messenger is the most used application in Saudi Arabia in 2020, with the highest number of users at 26.25 million users (Statista.com, n.d.). WhatsApp has become one of the most popular messaging applications because it is friendly for mobile users and low cost. It is also a full encrypted messaging system that strengthens users' privacy, sends real-time messages and multimedia content to individuals or groups, and use for business and education purposes (Cetinkaya, 2017). The convince and reliability that WhatsApp provides to its users have made the application a favourable tool that some studies suggest integrating into the education system and learning process (Al-Mothana, 2017). The Saudi Electronic University is a public university, and it is one of its kind in Saudi Arabia that provides a full, remotely learning experience to its students. It was founded in 2010, delivering a different range of courses for undergraduate students. It was established with a vision to make education accessible for everyone in the Kingdom and started with four leading colleges, management and financial science, computer science and informatics, health science, and theoretical studies (Saudi Electronic University, 2021). Students are expected to be heavily dependable on technologies for communication and engagement with their courses as the university is one of its kind in the country. Thus, it is worth investigating a proper communication tool that advances student engagement and improves academic performance. This paper will contribute to knowledge by studying the mediating role of student engagement and its effect on the relationship between the WhatsApp platform as a communication tool and students' academic performance. It also examines the issue from a complete and remotely online mode of delivery.

2. RESEARCH AIMS AND RESEARCH QUESTION

The Year 1 thesis aims to study the WhatsApp application usage and its association with student engagement and evaluate its direct effect on academic performance. Student engagement will be examined as the mediating factor of student engagement in the relationship between the usage of WhatsApp applications and academic performance. The Year 1 thesis is developed to answer the following two research questions: what effect does the WhatsApp application have on academic performance for students at the Saudi electronic university? And what role does student engagement play in the relationship between the usage of WhatsApp and academic performance?

3. RESEARCH BACKGROUND AND GAP

3.1 WhatsApp use & student engagement

Universities' default learning settings have always been in attendance mode. However, it has been changing with the revolution of technology and digital applications that shape different forms of communication and engagement. While the new state of learning has been delivered remotely with only engaging for learning purposes, student engagement in university presence settings is missing in remote education. Gachago et al. (2015) study the use of WhatsApp in teaching practices in South African institutions considering its benefits as a learning and engaging tool. Yet, it is still concerning due to its challenges, such as cognitive overload. Instant messaging systems, including WhatsApp, have attracted users because of their integration into the mobile system, enabling a more personalised learning experience and access from anywhere and anytime. They argue that platforms and applications, such as WhatsApp, are disruptive and have limited privacy and reliability. They also indicate that WhatsApp can be challenging in managing barriers between professional and personal relationships (Gachago et al., 2015). Binti Mistar et al. (2016) examine the use of WhatsApp in Malaysian tertiary institutions and view it as an essential platform that teachers and students use to communicate for ESL (English Second Language) learning purposes. Some students are challenged by some difficulties and lack the confidence to speak English in the classroom or have some ideas about topics they discuss, but they are embarrassed to speak English. Therefore, students and teachers use WhatsApp as a medium tool to share information, multimedia content, and ideas. It enables students to express themselves freely and access all information anywhere and anytime (Binti Mistar et al., 2016). She surveyed a group of Kuala Pilah Pre-University students from three different classes to evaluate students' attitudes towards the use of WhatsApp, its usefulness of WhatsApp, and students' behavioral intention toward WhatsApp. The study findings were at a high level in all three aspects, where students positively found WhatsApp helpful, had their behavior towards WhatsApp changed, and convince and easy to use (Binti Mistar et al., 2016). Abraham et al. (2019) investigated the use of WhatsApp in teaching and learning and found that only 22% of 1063 participants benefit from WhatsApp for learning and educational purposes. They also found that 77% of participants are not adequately engaged while using WhatsApp.

3.2 WhatsApp association with academic performance

Afful et al. (2020) examine the effect of WhatsApp on academic performance and study other social media platforms, including Instagram and Facebook. They surveyed 601 students with a response rate of 91.51% and found a positive and significant association between the use of WhatsApp for learning purposes and the CGPA of students. The authors focus on the use of WhatsApp for study-related purposes. They differentiate their study from other studies conducted by considering both academic and non-academic use of WhatsApp. The study discovers that creating discussion groups to share ideas and materials for academic matters help to improve students' academic performance. The groups break the shy, weak, and not confirmed barriers that prevent students from expressing themselves and receiving help from their colleagues (Afful & Akrong, 2020).

Sayan had three groups of high school students and teachers with 92 participants to determine the effect of WhatsApp usage on their academic performance. WhatsApp positively impacts students' academic achievements when they prepare for the exam using WhatsApp. To illustrate, the researcher compared the results of all the three groups who experienced a final exam experiment going through three stages: standard settings for a final exam, restricted use of WhatsApp, and obligated use of WhatsApp. The result shows that the group that uses WhatsApp was more successful and indicates that WhatsApp contributed to their success (Sayan, 2016). Coleman et al. studied the role of WhatsApp in medical education by searching papers published between 2009 to 2019. They used three stages for their research where only English articles were included. The term WhatsApp in medical education was included. They implemented the Kirkpatrick model to evaluate and present

the outcome of the collected studies. The study found that WhatsApp helped improve learners and increase their knowledge of medical education. The research concluded that WhatsApp could be an effective tool that helps improve the learning process and knowledge gaining for medical learners (Sayan, 2016).

Alkhalaf et al. (2018) surveyed 160 medical students at two universities in Saudi Arabia, AlBaha and the University of Dammam. They studied the impact of WhatsApp addiction on student performance and found that 53% of participants claimed they used WhatsApp for academic purposes. The study indicated that the time spent on WhatsApp was directly related to the symptoms of addiction. Still, it did not find a significant relationship between students' GPA and the use of WhatsApp. The research used different measurements to evaluate students' use of WhatsApp and academic performance. They used academic achievements, the grade point average (GPA) to measure academic performance, and time spent to measure WhatsApp usage. The paper also included some variables to collect in the survey, such as age, GPA, academic year, and frequency of use or time spent on WhatsApp (Alkhalaf et al., 2018).

3.3 Student engagement relational impact on WhatsApp usage and academic performance

Dahdal (2020) conducted the study using a mixed-method, surveying 23 students, and 17 responses were returned validly. Then the 17 participants had a face-to-face interview to collect the qualitative data. The approach was employed to determine the effectiveness of having WhatsApp integrated with the study course assignment and to evaluate active learning before, after lectures, and during assignments project. The study found that students benefited from WhatsApp in their engagement with the course materials and communication for assignments or group projects. However, the paper did not indicate an impact of WhatsApp usage on academic performance while students' engagement improved (Dahdal, 2020). Alshaye (2018) examines the use and engagement of students for academic and discussion related to subject matters. The paper investigates three social media platforms, including Facebook and WhatsApp, to evaluate students' engagement with software project management courses. The study uses various surveys at the end of each semester to determine students' satisfaction and engagement. 78% of participants strongly agreed to use WhatsApp as a discussion forum, and 76% strongly agreed to recommend using WhatsApp over other social media platforms. The results show that using WhatsApp makes students more satisfied and engaging, and familiarity with WhatsApp use is a key factor for students' engagement. It enables informal communication among students and lecturers, removing barriers preventing student engagement. The paper lacks to indicate if students' satisfaction and engagement with WhatsApp use are relevant or a factor that improves students' academic performance (Alshaye, 2018).

Appleton et al., (2006) studied and discussed students' levels of engagement and addressed four subtypes of factors to consider and learn about students' engagement; academic, behavioral, cognitive, and psychological. The academic type contains variables such as time on task, homework achievements, attendance, and classroom participation. The psychological and cognitive engagement has more internal variables, including the value of learning, personal goals, self-discipline, feelings of belonging, and relationships with other students and teachers (Appleton et al., 2006).

4. RESEARCH HYPOTHESIS

The following hypotheses have been developed based on literature addressing the effect of WhatsApp usage, students' engagement, and academic performance.

Hypothesis 1: WhatsApp application usage is negatively related to student engagement.

Hypothesis 2: Student engagement is positively related to academic performance.

Hypothesis 3: Student engagement negatively affects the relation between WhatsApp usage and academic performance.

Hypothesis 4: Using WhatsApp increases academic performance

Hypothesis 5: The relationship between WhatsApp use and student engagement will be moderated by major

The conceptual framework is developed to measure the association and relationship between WhatsApp, student engagement, and student academic performance. The conceptual framework suggests a negative relationship between WhatsApp usage and student engagement based on the findings in the literature. It also proposes a positive relationship between student engagement and their academic performance. However, the conceptual framework suggests a negative and indirect relationship between WhatsApp usage and students' academic performance. It proposes student engagement as a

mediator that indirectly and negatively affects the relationship between the independent (WhatsApp usage) and dependent (academic performance) variables.
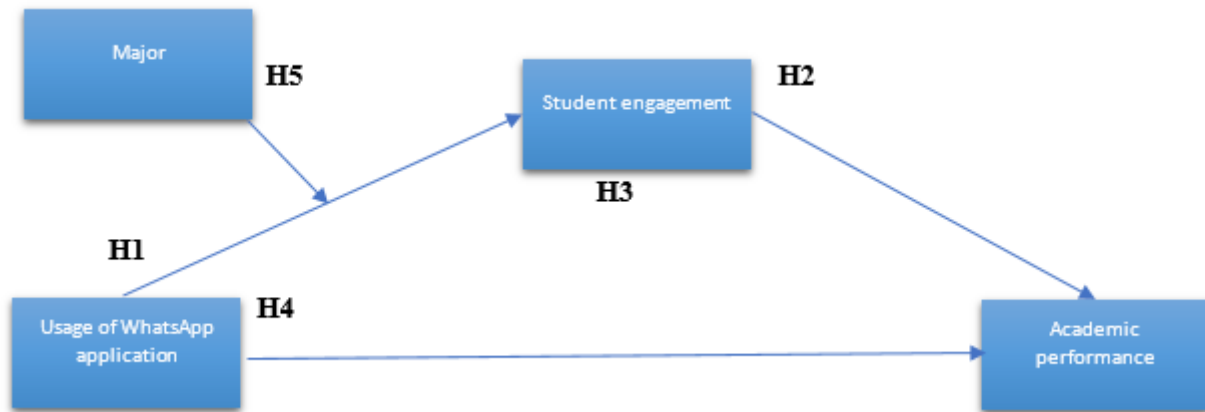
5. RESEARCH METHOD

5.1 Sampling and Data collection

The population is all students enrolled in the Saudi electronic university, 32,444. Some students will be excluded because they are in their first semester and do not have their results yet. However, the official website of the Saudi electronic university does not provide enough data to establish a robust sampling approach. Thus, the study will employ a convenience sampling approach. It is a sampling method and type of non-random sampling and nonprobability. The approach is applied when researchers choose a target population that meets specific requirements and criteria—easy accessibility, geographical location, and availability at a given time (Alkassim et al., 2016). I will be contacting the university to reach students out through the available communication channels and identify a sample of different students to ensure the diversity of the sample with diverse student groups. Some parameters are set to contribute to the sample to represent the population, including gender, academic year, and college.

The research will adopt an online survey to collect data, and it will be designed to ensure the accuracy and quality of the data collected. The questions will be simple, logical, straightforward, and adjusted for a reasonable time (Stone & coded, 1993). After acquiring the ethic approval from VU ethic and integrity committee, the researcher will contact Saudi Arabian Cultural Mission to officially identify the researcher as PhD scholar to the Saudi Electronic University. The ministry of Education in Saudi Arabia instructs all Saudi Universities to cooperate with scholar students. Then, the researcher sends the survey link to the Saudi Electronic University-Higher Degree Research dean office with introduction of the survey, including the aim of research, privacy terms, and risks of participation if any. The HDR dean office forwards the survey by email to all students. different colleges will be moderator.

I used the Check Market tool to estimate the required sample size and number of invites to establish an initial estimation. The population size is 32,444 with a margin of 5% error and 95% confidence level, so the required sample size will be 380 respondents. The estimated response rate is 20%, as participants will be contacted through their university emails once access granted upon ethical approval and current PhD researchers suggest low response rate. Thus, the number of participants to invite is 1,900 (CheckMarket.com). The education higher ministry requires Saudi universities to cooperate with PhD students, so I will contact the student management department at the Saudi electronic university to draw the data collection procedures. First, we select students who enrol in the computing and informatic college and study in one of the following majors as the will be also moderator: information technology, computer science, and data science. Then, we only select students currently enrolled in the first semester of 2022. Students using WhatsApp for academic discussion, group projects, assignments, questions with lecturers, or any academic purposes will be only chosen. However, students using WhatsApp for academic purposes for all four subjects they are currently enrolled in will be excluded. There is at least one subject that student do not use WhatsApp for to compare their academic performance with other subjects that involve using WhatsApp.

We will establish pre-tests rounds to ensure we receive high-quality data and responses. Once amendments are made and the final questionnaire form is ready, the survey will be emailed to students. The period of collecting responses will be for six weeks, with a follow-up and reminder email every two weeks.

The measurement is a process that begins by choosing a subject or event to analyse and observe. It investigates the guidelines that contain codes or selected numbers to provide some features about the subject. The research will use a measurement scale to determine the study's variables and help eliminate biases (Dalati, n.d.). Building on literature and measurement models addressed earlier; the first measurement will be employed for WhatsApp usage. It will be based on the number of hours students spend on WhatsApp in each learning groups. It will also determine the percentage of students joining WhatsApp group learning. Next, it measures how active the group and how many students participate in the group every day. The following measures will be used for student engagement, and it will adopt the five-point scale from strongly disagree to agree strongly. The final measurement will be the GPA score, the four-point scale, to measure student performance. Student engagement measures will include academic, cognitive, psychological, and behavioral engagements, following the literature model to build the student engagement measurement scale. The initial questionnaire in the appendix will show measurement implementation in the questions (Fredricks et al., 2016)

The researcher will use some practices to clean the data. First, I will drop any sample that have incomplete response and speedy responses as -I will time the survey-. I will also look at responses that have straight-line answers where all questions have one choice and exclude them. Finally, I will drop outlier responses that include unrealistic answer and inconsistent responses.

5.2 Analysis

The SPSS software will be employed to analyse the collected data implementing the PROCESS macro to test our study hypotheses. The PROCESS macro package will be used to test the mediator impact (student engagement) as it is a powerful tool that analyses many samples. As indicated in the hypothesis that student engagement is the mediating role and has an indirect effect, it will be evaluated to determine the coefficient estimates results. We will also assess the confidence interval level to find the significance of the mediator. The PROCESS macro will also help us include covariates to the mediator (student engagement), including dependent variables, academic year, age, and gender. Those variables are addressed to find their effect on academic performance and student engagement. In practice, we run SPSS and go to analyze option, and select regression to open PROCESS by Andrew F.Hayes. We will then have our three variables, WhatsApp application, student engagement, and academic performance. We will set our academic performance as our dependent variable and place it in the Y variable section; the WhatsApp application will be selected as the independent variable and be placed in the X variable section. Student engagement is our mediator and will be placed in the Mediators(s) M section. As our model is 1, we will set the model number to 4, the confidence interval is 95%, and the number of bootstrap samples is 5000. We expect the first return outcome from the analysis show the relationship between our independent variable X (WhatsApp) and the mediator (student engagement). The second output will show the mediator effect (student engagement) on the Y variable (academic performance). Finally, the output will also show our X variable's direct and indirect impact on the Y variable.

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1. Appendix

Link to the survey:

https://vuau.qualtrics.com/jfe/form/SV_9phh5MRw0FR7Kmy