

AUTHOR:

Dr Fazlyn Petersen¹ 

AFFILIATION:

¹University of the Western Cape,
South AfricaDOI: [https://doi.org/10.38140/
pie.v41i1.6318](https://doi.org/10.38140/pie.v41i1.6318)

e-ISSN 2519-593X

Perspectives in Education

2023 41(1): 18-37

PUBLISHED:

31 March 2023

RECEIVED:

20 May 2022

ACCEPTED:

14 March 2023

Factors affecting students' use of a data-free instant messenger for on-line peer tutoring: a large, undergraduate class at a historically disadvantaged university

Abstract

There is a need for synchronous and inclusive online peer tutoring in large, undergraduate classes. As a lack of data or internet connectivity may limit online peer tutoring, the use of a data-free instant messenger was implemented for online tutoring in a class of 342 students. The Moya application allows students to chat and send voice notes to tutors and peers without using data. Sending attachments incurs data costs but the amount of data is displayed prior to downloading. The qualitative interpretivist case study used data collected from purposive sampling via an online survey. Consent was received from 252 third-year Information Systems students at a historically disadvantaged university. Qualitative data were analysed via thematic content analysis using the Unified Theory of Acceptance and Use of Technology 2 model as a theoretical basis. Findings indicate that the majority of students (85.7%) did not use the data-free Moya instant messenger. Reasons for the low usage included a negative performance expectancy, as students did not see the benefit in using the application to engage with peers or tutors. Perceived effort expectancy was low, as students did not desire to learn to use a new application. Results showed that using WhatsApp was a habit. Moreover, social influence was a factor, as fellow students and tutors were also using WhatsApp. Students recommended increasing awareness of the Moya application and providing training. The price value was expected to be a significant factor as this application does not require data, but this was not the case. Facilitating conditions show that students had data for WhatsApp. Moya has the same interface design as the preferred WhatsApp so learning to use the application should require minimal effort. The unexpected findings indicate that students prefer WhatsApp, an instant messenger that requires data, over a data-free instant messenger. The findings leave lecturers questioning whether using WhatsApp for online peer tutoring is the more viable option.

Keywords: *Data-free, large classes, mobile instant messenger, online peer tutoring, Unified Theory of Acceptance and Use of Technology 2*

1. Introduction

South African higher education is plagued by inequalities due to the legacies of apartheid. Student demographics reveal that more than 50% of enrolment in higher education is from black, working-class, disadvantaged households from rural areas who are dependent on the National Student Financial Aid Scheme (NSFAS) (Mzileni, 2020). Consequently, the student population is likely affected by data costs. The historically disadvantaged institution (HDI) in this study, based in the Western Cape, South Africa, is committed to providing access to quality education to historically marginalised population groups, predominantly students of colour (University of the Western Cape, 2019).

To provide quality education during the COVID-19 pandemic necessitated the use of online modes for tutoring. Online tutoring can also be applied post-COVID-19, but may exclude students from historically marginalised population groups due to the cost. The article examines two asynchronous tools implemented for online tutoring to provide insight into future use of such technologies in the post-COVID-19 era.

Tutoring is defined as “people who are not professional teachers helping and supporting the learning of others in an interactive, purposeful and systematic way” (Topping, 2000:3). This research uses peer tutoring. Peer tutors are students who have completed the course previously and assist current students with their studies. Tutoring is both versatile and transformative (Nickow, Oreopoulos & Quan, 2021), providing more practice and simpler vocabulary with prompter feedback (Topping, 2000). The use of peer tutoring improved students' performance at a Spanish university (Arco-Tirado, Fernández-Martín & Hervás-Torres, 2019). Research has determined that tutoring shows improvements in socio-emotional skills, well-being, aspirations and psychological skills (Carlana & La Ferrara, 2021).

Tutoring using asynchronous tools such as discussion boards and forums (Turrentine & MacDonald, 2006) is likely to be less data intensive. However, research indicates that the use of asynchronous cooperative learning may fail, as students feel disconnected (Peterson, Beymer & Putnam, 2018). On the other hand, students' use of synchronous peer learning to discuss challenging problems is evidenced to produce better outcomes and stronger morale in an online setting (Coetzee *et al.*, 2015). In addition, students feel more connected, have a greater sense of belonging and improve mental processing when using synchrony (Peterson *et al.*, 2018).

In the future, students may not always be able to engage face to face. As institutions move towards more hybrid models of education, they increasingly combine traditional classroom teaching with distance education using information technology resources (Misaghi *et al.*, 2021). The need for more inclusive synchronous, real-time learning and tutoring may increase in prevalence. With that, the use of mobile instant messaging (MIM) as a means of providing more inclusive synchronous tutoring should be considered. Research into MIMs such as WhatsApp has explored uses for teaching and learning (Tang & Hew, 2017).

Based on the typology of peer tutoring by Topping (1996), Table 1 shows the application of this research.

Table 1: Typology of peer tutoring

Dimension	Application to this research
Curriculum Content	Tutors use MIM to help students understand the undergraduate Information Systems course content. Tutors also assist with queries regarding formative assessments like quizzes and discussion forums.
Contact Constellation	Due to the large class size of 342 students, two WhatsApp groups and one Moya group were established. There were six tutors, three lecturers and a teaching assistant. Tutors were asked to join the WhatsApp groups and the Moya group. However, tutors preferred to use WhatsApp. Due to the low number of students who joined the Moya groups, the six tutors were allocated to WhatsApp. The teaching assistant and the module coordinator remained in the Moya group to assist any students.
Year of Study	Tutors and students were at different levels of study. Tutors were in Honours and students were in their third year.
Ability	Tutors' ability to understand and explain the course content was expected to be better as they had completed the course in the previous year. Using MIM also allows students to learn from their peers through collaborative learning (Barhoumi, 2015).
Role Continuity	Tutors in the first semester continued tutoring in the second semester.
Place	Using MIMs allows students to access tutoring regardless of their geographical location (Johns & Mills, 2021). Students in metropolitan areas may have access to better network connectivity than those in rural areas (Statistics South Africa, 2020).
Time	Tutors were allowed to select their consultation, with some consultation during class times and some after hours. This consultation schedule allowed students to access tutoring after hours, especially helpful for students working during the day. Although consultation hours were published for students, tutors indicated that consultation often extended beyond the agreed times. Literature indicates that using MIMs may provide additional responsibilities such as the expectation to interact outside stipulated hours (Poon <i>et al.</i> , 2019) and communication overload (Rosenberg & Asterhan, 2018).
Tutee Characteristics	Tutees were all students in the compulsory third-year Information Systems course: Information Systems Strategy Formulation. Students were diverse, speaking several home languages and residing in various South African provinces. The majority of students were full-time, with a minority part-time. The literature from South Africa indicates that mature and married students found the use of MIMs disruptive to family life (Rambe & Bere, 2013). The finding is supported by literature from India where about 20% of the student sample did not find MIMs convenient because they compromised their private and family time (Gon & Rawekar, 2017).
Tutor Characteristics	Preference is given to the best-performing students in terms of grades in the Information Systems Strategy Formulation course. Students with tutoring experience were preferred. The literature indicates that tutoring provides an increase in academic achievement for tutors as well (Raja, Low & Lim, 2018). Tutors are given the opportunity to gain work experience; payment can be applied to their student fee account.
Objectives	The objective of offering online tutoring was to provide students with increased access and improved pass rates.

Using MIM tools allows for spontaneous and student-centred learning instead of instructive teaching in classrooms (So, 2016). The literature indicates that using an MIM such as WhatsApp encourages knowledge sharing, knowledge creation, increased participation and collaboration (Pimmer, Lee & Mwaikambo, 2018; Rambe, Chipunza & Ng'ambi, 2020). For example, WhatsApp has been used to tutor English (Muhammad & Annamalai, 2021). Likewise, 19 tutors effectively used WhatsApp in a nurse tutor programme in Nigeria (Ajuwon *et al.*, 2018). The University of South Africa, a distance education institution, indicates that students show a preference for gaining peer support by using WhatsApp (Mihalyi *et al.*, 2016). In another study by South African researchers, the presence of tutors in educational WhatsApp groups showed a positive impact on first-year computer science students (Nogubha & Mhlana, 2022).

However, the challenges of using MIM include the cost of devices such as mobile phones and laptops, device ownership, regular electricity outages and unreliable internet connectivity from mobile operators (Tang & Hew, 2017; Nyasulu & Dominic Chawinga, 2019). Despite the increasing number of people with access to smartphones, in low- and middle-income countries, 1GB of data costs more than 5% of people's monthly earnings (A4AI, 2018). The inability to afford internet access is therefore a significant barrier to access. Evidence also indicates that only 10.4% of the South African population has internet access at home (Statistics South Africa, 2018). The Western Cape province (25.8%) shows the highest percentage of internet access at home, with the lowest being the Limpopo province (1.7%) (Statistics South Africa, 2018). Additionally, homes in rural areas are less likely to have internet access (1.7%) compared to homes in metropolitan areas (17.3%) (Statistics South Africa, 2018). These figures are representative of the significant inequalities in the South African population that may have a negative impact on the lower socioeconomic student base.

To provide more student inclusivity, the use of a South African data-free MIM, Moya, was tested (Petersen, 2020). The Moya application allows students to chat and send voice notes to tutors and peers without using data. Sending attachments incurs data costs, but the amount of data are displayed before downloading (biNu, 2020). The pilot results show that the Moya MIM is easily usable and accessible. Consequently, the use of Moya is expected to provide more inclusive student access to online tutoring. Challenges to using the Moya MIM include reliance on network connectivity and activated Wi-Fi (Petersen, 2020).

The paper is organised as follows: the formulation of the problem statement, examination of acceptance and use models and the selection of an appropriate theoretical framework. This is followed by the research design, sampling and the method for collection of qualitative evidence. The findings are then presented in comparison with findings of existing literature. Lastly, the limitations of the study are discussed and recommendations for future work are presented.

2. Problem statement

Research on the use of MIM has predominantly been undertaken in small classes of fewer than 50 students (Alenazi, 2017; Lim, Shelley & Heo, 2019). However, there is limited literature regarding the usage of MIMs for online peer tutoring using data-free options in large classes in the light of the South African digital divide, contextual factors and significant inequalities (Petersen, 2020).

Therefore, this research offers deeper insight into this context, as the objective of this study is to determine the factors that affect the use of an instant data-free messenger for online peer tutoring in a large undergraduate class. The research targeted a specific student population in South Africa’s Western Cape that is prone to technological exclusion to answer the research question: *Which factors affect students’ use of a data-free instant messenger for online peer tutoring?*

In addition, the research values student recommendations for future implementations by posing the research question: *What would improve your use of the data-free instant messenger?*

3. Theoretical framework

Six prominent acceptance and use models with key constructs are summarised in Figure 1. The models and their application to the acceptance and use of MIMs in education are discussed in turn.

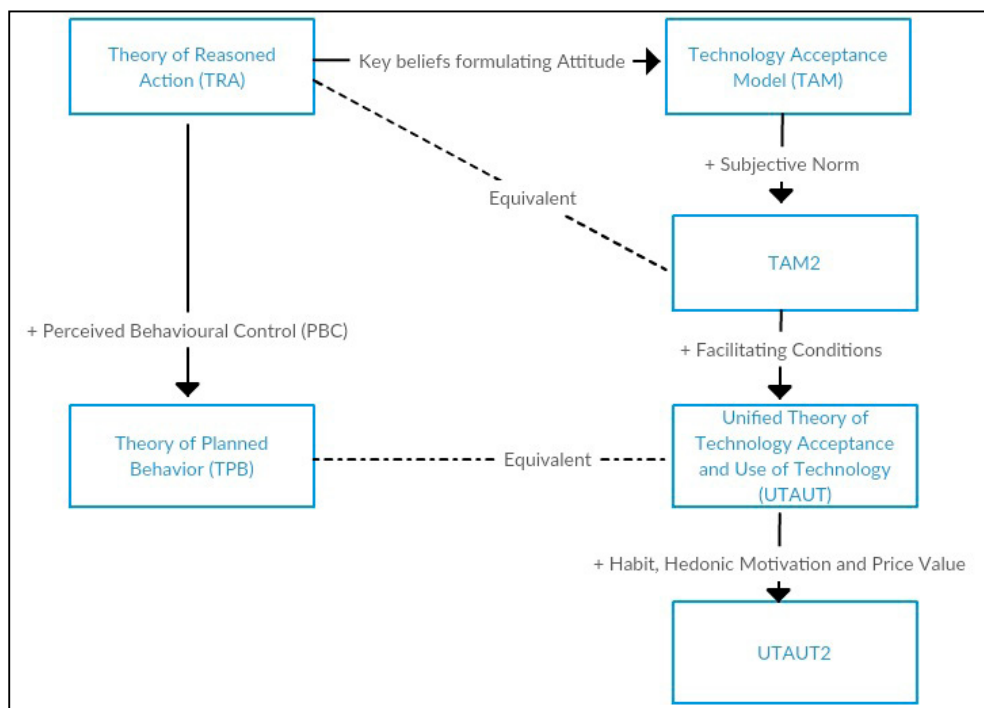


Figure 1: Summary of technology acceptance and use models (adapted from Sun et al., 2013)

Fishbein and Ajzen developed the Theory of Reasoned Action (TRA), which contains three constructs that determine behaviour to use a data-free MIM for online tutoring:

1. Attitude refers to students' positive or negative feelings about using the Moya MIM for online tutoring (Hill, Fishbein & Ajzen, 1977).
2. Subjective norms refer to student perceptions that the people the most important to them, such as peers or parents, think they should use the Moya MIM (Hill *et al.*, 1977).
3. Behavioural intention refers to student intention to use Moya MIM for online tutoring (Hill *et al.*, 1977).

A particular TRA study at a public research university in distance learning courses, based in America, sought to determine faculty intentions to use social networking. The findings indicate that subjective norms and attitudes influence faculty members' intentions and behaviours (Jones, 2019). While the study provides insight into factors affecting the usage of social networking, it was tested within a context in a developed country and the study focused on faculty members' intentions without examining student intentions.

The Theory of Planned Behaviour (TPB) expands TRA by adding perceived behavioural control (PBC) (Ajzen, 1991). PBC, in this research, describes the "perceived ease or difficulty" of using the Moya MIM for online tutoring (Ajzen, 1991:183). TPB was utilised in a Malawian study that examined university students' use of WhatsApp for learning (Nyasulu & Dominic Chawinga, 2019). The results suggest that students could share information instantaneously, communicate with peers and lecturers, collaborate on academic work and learn outside classroom hours (Nyasulu & Dominic Chawinga, 2019). The findings from another university in a developing country may apply to this research context, except that the cost of data in South Africa is higher than the cost of data in Malawi (A4AI, 2018).

The Technology Acceptance Model (TAM) adapts TRA with the inclusion of two key constructs: perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989). According to Davis (1989), PU indicates whether or not students believe that using the Moya MIM would improve their academic performance. PEOU indicates whether or not students believe that using the Moya MIM would be effortless (Davis, 1989). TAM 2 expands TAM with the addition of subjective norm. Therefore, as indicated in Figure 1, TRA is equivalent to TAM 2, based on key constructs.

TAM was used as a theoretical framework in a study on undergraduate students' usage of WhatsApp for collaborative learning at a Nigerian university (Udenze & Oshionebo, 2020). Udenze and Oshionebo's (2020) findings confirm that PU and PEOU are important factors; however, there was a challenge of irrelevant content posted by students. Additionally, in a study at a Saudi Arabian university, educators found WhatsApp to have a high PEOU (Barhoumi, 2017). PU is positive when students can simplify content and reduce misunderstanding by using MIM for learning (So, 2016).

A study on using MIMs for distance education in Cyprus suggests that WhatsApp is user friendly (PU), accessible and cost effective (Nawaila & Bicen, 2018). The use of an MIM for hybrid learning also determined a 77% satisfaction index, with 90% of the sample confirming the importance of WhatsApp to integrate with peers and teachers (Misaghi *et al.*, 2021). WhatsApp was found to improve undergraduate learning in medical education when combined with traditional teaching in Lahore, Pakistan (Dar *et al.*, 2017).

A study among a small sample of 25 first-year students at a South African university shows that students from disadvantaged schools prefer using an MIM, such as WhatsApp. The higher PEOU for WhatsApp is due to student struggles to use their institutional electronic learning management system (eLMS), Moodle (Mpungose, 2020).

The Unified Theory of Acceptance and Use of Technology (UTAUT) constructs are similar to TPB's PBC, social norm and behavioural intention. UTAUT extends TAM 2 with the addition of facilitating conditions (FCs), meaning whether or not students believe that organisational and technical infrastructure is available to support the use of the data-free MIM (Venkatesh *et al.*, 2003). UTAUT was applied in a study at a university of technology in South Africa with a sample size of 196 students (Bere, 2014). Bere's (2014) results indicate that three of the original UTAUT constructs – performance expectancy, effort expectancy and social influence – are positively associated with behavioural intention to use mobile learning. The importance of social influence at university due to peer support is likewise highlighted by Awotunde *et al.* (2020). However, FC was not considered in this study as organisational technical support is expected to be a prominent factor in this research.

The importance of FC is highlighted by Bere (2019), who argues that FC plays a role in contexts with geographical barriers and network connectivity costs (2019). In a study describing the challenges for students to engage in online tutoring in rural South Africa, limited access to devices and network connectivity was again highlighted (Motaung & Dube, 2020). Annese *et al.* (2022) highlight the importance of FC in understanding the context, technology and learning goals for implementing effective tutoring. Disabling technical FC, such as using small mobile phone screens, can generate eye strain (Gon & Rawekar, 2017). Enabling Wi-Fi on campus can render the use of MIM cost effective (Gon & Rawekar, 2017). Additionally, using applications that are data free will also provide cost-effective MIM access (Petersen, 2020).

The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) expands the UTAUT model by adding the following constructs:

- *Hedonic motivation* (HM) is the “fun or pleasure derived from using a technology” (Venkatesh, Thong & Xu, 2012:161). The literature suggests that WhatsApp can be used for social activities such as relaxing with friends and family and watching videos (Awotunde *et al.*, 2020). HM may pose a challenge when students use the same MIM for pleasurable activities as well as educational purposes.
- *Price value* is “consumers’ cognitive trade-off between the perceived benefits of the applications and cost for using them” (Venkatesh *et al.*, 2012:161). The price value is expected to be a factor, as students will no longer need to pay for data when using the Moya MIM for online peer tutoring.
- *Habit* is “the extent to which people tend to perform behaviours automatically because of learning” (Venkatesh *et al.*, 2012:161). If students frequently use WhatsApp or prefer using another MIM, this may impact the use of the data-free MIM.

Based on the summary of acceptance and use models and the discussion above, UTAUT2 was selected as the theoretical lens for this research (refer to Figure 2).

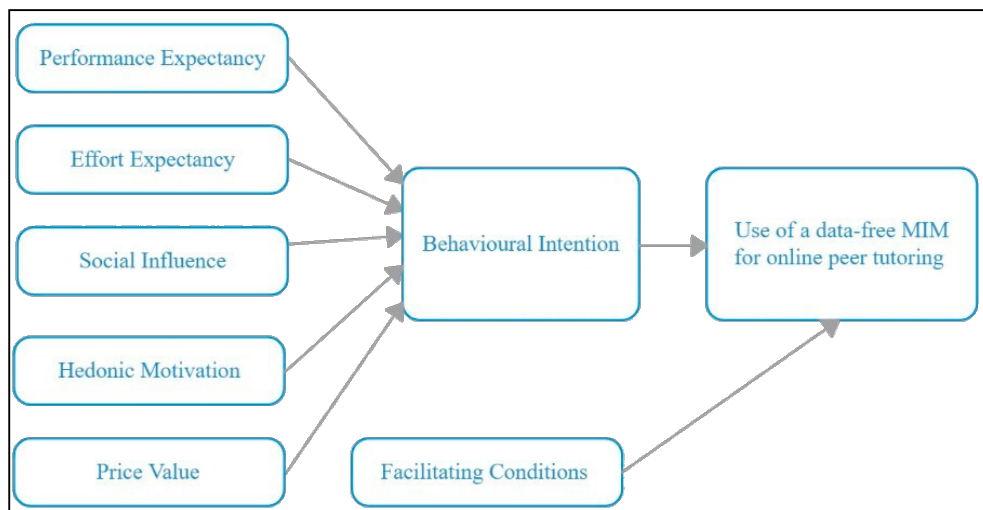


Figure 2: Theoretical model (Source: Venkatesh et al., 2012)

The overriding premise is that the factors in this model may provide insight into student acceptance and use of the data-free MIM for online peer tutoring within this context. UTAUT2 was used in a study to predict student intention to use mobile learning systems in India. Results indicate that effort expectancy and performance expectancy are significant factors (Bharati & Srikanth, 2018). Bharati and Srikanth (2018) suggest that when technologies improve student learning experience, the technologies will be used by the students. However, this was not tested within a South African context with the use of a data-free MIM.

4. Research design and methodology

This research used a qualitative interpretivist case study as it aimed to analyse the use of an instant data-free messenger for online tutoring. Based on Mouton (1996), interpretivism allowed the researcher to focus on the real world of students and to gain an insider perspective into the challenges and opportunities that affect student use of a particular MIM for online peer tutoring.

A case study emphasises the importance of understanding the context to determine factors affecting student use of the data-free MIM in a large class at the University of the Western Cape (UWC), a historically disadvantaged institution (Yin, 2003). A qualitative study to explore a phenomenon in a single case allows a researcher to explore a deeper meaning of experiences with predominantly marginalised students (Creswell & Poth, 2007). As stated in the typology of peer tutoring, the class size was 342 registered third-year Information Systems students.

Qualitative data were collected using purposive sampling via an online survey designed using Google forms. Due to the exploratory and interpretivist nature of this research, students were asked three primary open-ended questions to answer the main research question:

- Which tool/s did you not use in this course?
- Why did you not use it?
- What would improve your use of that tool?

Interviews were not conducted due to COVID-19 social distancing restrictions during lockdown levels one and two. Due to the high cost of data for video conferencing, tools such as Zoom were also not viable options. Consent was received from 252 students to use their responses for research purposes.

The qualitative survey data from Google forms were saved onto a spreadsheet. The spreadsheet was converted into PDF format and imported into Atlas.ti software. The data were analysed via thematic content analysis, using the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model as a theoretical basis. Student responses were coded, using the literature, and grouped according to the constructs in the UTAUT2 model. The groups were analysed to identify the factors that were shared amongst the students (Vaismoradi, Turunen & Bondas, 2013).

The research was conducted according to the ethical and professional guidelines as specified by the University of the Western Cape. Consent was sought from the students to allow for the publication of responses. Students reserved the right to refuse their responses to be used for this research. Unique identifiers (such as student numbers) were removed before analysis. The confidentiality of the data supplied by students was respected by storing data in an access-restricted folder.

5. Findings

The findings commence with the analysis of students' demographics and the identification of factors affecting students' use of a data-free instant messenger use. The section concludes with students' recommendations for improved usage of Moya MIM for online peer tutoring.

According to Figure 3: Student demographics, most students were full-time (91.7%) and male (50.4%). Students were predominantly young: in the 18–24-year age group (81.8%). The majority of students resided in the Western Cape (77.7%) and spoke English (51.8%), Xhosa (14.7%) or Afrikaans (9.2%) as their home language. The remaining students resided in the Eastern Cape (8.8%), Gauteng (5.2%), Limpopo (2.4%), the Free State (1.2%) or Mpumalanga provinces (1.2%). The majority of students used Wi-Fi (50.8%), with 21.9% using prepaid mobile data.

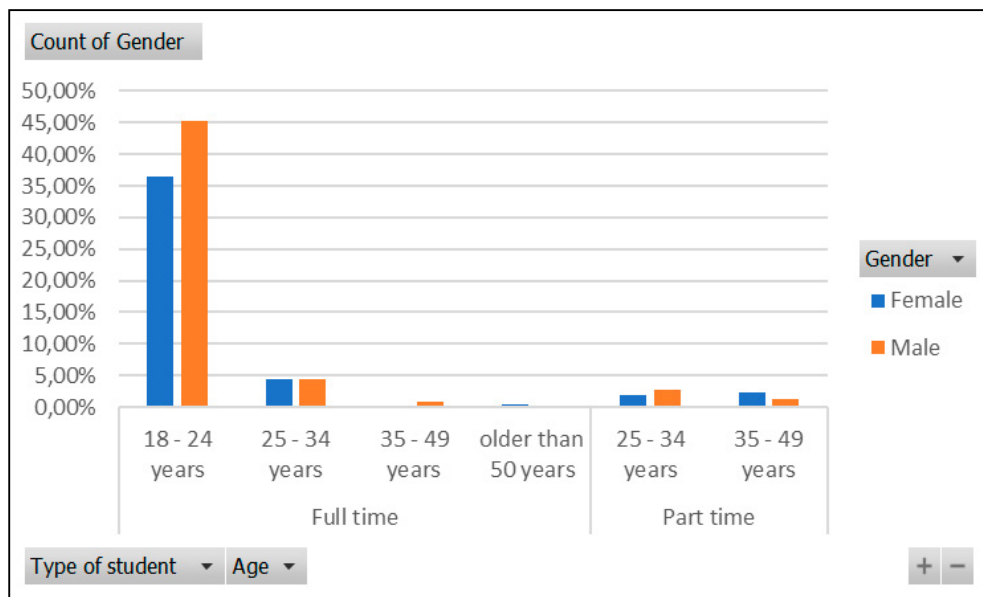


Figure 3: Student demographics

6. Factors affecting student use

Findings indicate that most students (85.7%) did not use the data-free Moya instant messenger. The unexpected finding indicates that students prefer WhatsApp, an instant messenger that requires data, over a data-free instant messenger. Table 2 presents the themes in this research, based on the theoretical model. These themes identified by students contribute to the existing literature by identifying the factors responsible for the unexpected low usage of a data-free MIM for online peer tutoring.

Table 2: Atlas codes for factors

Code	Grounded	Density	Code Groups
future use	1	0,4%	Behavioural intention
connectivity issues	2	0,8%	Disabling facilitating conditions
incompatible	2	0,8%	Disabling facilitating conditions
insufficient data	1	0,4%	Disabling facilitating conditions
no access	1	0,4%	Disabling facilitating conditions
no phone	2	0,8%	Disabling facilitating conditions
no Wi-Fi access	1	0,4%	Disabling facilitating conditions
space	6	2,4%	Disabling facilitating conditions
connection	1	0,4%	Enabling facilitating conditions
internet access	3	1,2%	Enabling facilitating conditions
sufficient data	9	3,5%	Enabling facilitating conditions
sufficient devices	1	0,4%	Enabling facilitating conditions

Code	Grounded	Density	Code Groups
VPN access	3	1,2%	Enabling facilitating conditions
Wi-Fi access	8	3,1%	Enabling facilitating conditions
did not know how to use	5	2,0%	Effort expectancy
difficult to use	1	0,4%	Effort expectancy
effort required	4	1,6%	Effort expectancy
unfamiliar	14	5,5%	Effort expectancy
MIM preference	75	29,5%	Habit
not appealing	1	0,4%	Hedonic motivation
less interactive	1	0,4%	Performance expectancy
no benefit	1	0,4%	Performance expectancy
no need	32	12,6%	Performance expectancy
not useful	3	1,2%	Performance expectancy
other options	26	10,2%	Performance expectancy
group preference	6	2,4%	Social influence
peers not using	4	1,6%	Social influence
didn't access	1	0,4%	Use
LMS preference	9	3,5%	Use
unaware	26	10,2%	Use
voluntary	4	1,6%	Use
	254	100,0%	

Factors for the low usage included a negative performance expectancy, as students did not see the need for (12.6% of responses) or benefit of using Moya MIM to engage with peers or tutors. Data indicate that having other options (10.2% of quotations), such as WhatsApp and an LMS, negatively impacted the use of Moya, as encapsulated in the following quotation: *“I did not need the use of Moya as I already have access to all information on Ikamva [LMS] and WhatsApp”*. This finding, however, is contrary to a quantitative study that indicates the influence of performance expectancy on behavioural intention when using another MIM, WhatsApp (Fernández Robin, McCoy & Yáñez, 2017).

A low effort expectancy (4% of responses) was evidenced by student beliefs that Moya MIM was difficult to use and that effort was required: *“Did not use it, because I did not understand how it works.”* Students admitted that they did not know how to use the Moya MIM, despite the similarities in user interface to WhatsApp (Petersen, 2020). In fact, Moya has the same interface design as the preferred WhatsApp, so learning to use the application requires minimal effort, especially from third-year Information Systems students. Based on a Zimbabwean study during the COVID-19 pandemic, effort expectancy encourages the use of WhatsApp (Maphosa, Dube & Jita, 2020).

Habit was identified as the most prominent factor among all students (29.5% of responses). Results showed that using WhatsApp was a habit and therefore was the preferred MIM. Several comments supported this finding: *“I did not use the Moya because I preferred WhatsApp as a communication tool”* and *“I stuck to something I was familiar with, WhatsApp Messenger”*.

However, the habit of using WhatsApp and constantly checking the MIM is found to affect academic activities negatively (Odili, 2021).

Social influence was not determined to be a significant factor (4% of responses). The results indicated that as fellow students and tutors also used WhatsApp, this encouraged the use of this MIM. It was evident that when group members for assignments preferred a certain MIM, then it would be used: *"My group members and myself all had access to WhatsApp and decided to make use of WhatsApp for communication in regards to our assignment"*. A factor influencing a negative social influence was the lack of use by peers, *"more people are on WhatsApp than Moya"*. The literature indicates that using WhatsApp as the social media platform for e-tutoring is beneficial, despite tutors using WhatsApp for entertainment purposes as well (Nogubha & Mhlana, 2022).

Facilitating conditions were split to identify the factors that would encourage or discourage the use of the data-free Moya instant messenger for online peer tutoring. Enabling facilitating conditions showed that students had data for WhatsApp and devices as evidenced by, *"[I] have sufficient devices and connectivity"*. As 50.8% of students have access to Wi-Fi, this would facilitate the use of MIM requiring data, such as WhatsApp. A minority of students (2.4% of responses) indicated that students had insufficient space to download the Moya MIM.

Disabling facilitating conditions were only indicated by a minority of students (6% of responses). The issue of incompatibility by a small minority of students (0.8%) has been resolved. As stated previously, the Moya MIM now has a version available for Apple users (Moya App Pty Ltd, 2022). However, one student admitted to data insufficiency and yet still did not choose the data-free MIM option. Networking connectivity is indicated as a challenge for e-tutoring (Motaung & Dube, 2020), although this was not highlighted as a significant challenge in this particular student sample.

The fun or pleasure in using Moya instant messenger was not evidenced. Hedonic motivation was only mentioned by one student who indicated that *"Moya, it is just not appealing to me"*.

It was anticipated that price value would be a significant factor due to this application not requiring data; however, again, this was not the case. Despite the comparatively high cost of South African mobile data (Healing, 2019), students' preference for using WhatsApp may be due to the purchase of less expensive dedicated WhatsApp data bundles from three of South Africa's mobile operators: Vodacom, MTN and Cell C (Staff Writer, 2021). For the 21.8% of students who use prepaid mobile data, WhatsApp social bundles are approximately 33% less expensive. As an example, MTN's 1GB WhatsApp social bundle costs 30 South African Rand (approximately \$2), whereas it costs R99 (approximately \$6) for a 1GB monthly mobile data bundle (Staff Writer, 2021).

Behavioural intention was demonstrated as a student indicated they would use the Moya MIM in future: *"I also didn't check out the Moya messenger app maybe I missing out on a good opportunity to explore different technologies so I am definitely looking forward to using it currently and in the future"*.

The low usage level of Moya instant messenger for online peer tutoring can also be attributed to student claims of a lack of awareness of the application (10.2% of responses). There was also a preference for using UWC's LMS. Students indicated that using Moya instant messenger for online peer tutoring was voluntary, as there was an option to use WhatsApp. The finding is corroborated by the following quotation: *"I was never forced to use it"*.

7. Recommendations for improved usage

Table 3 presents codes and code groups extracted from Atlas.ti software. The information was used to identify the common student recommendations to improve their low usage of the Moya instant messenger for online peer tutoring. These recommendations can be used to improve the use of Moya instant messenger for online tutoring in the future.

Table 3: Atlas codes for recommendations

Code	Grounded	Density	Code Groups
future use	2	1,4%	Behavioural intention
become more familiar	2	1,4%	Effort expectancy
better functionality	4	2,8%	Effort expectancy
easier to use	1	0,7%	Effort expectancy
get it to work	1	0,7%	Effort expectancy
guidance	2	1,4%	Effort expectancy
improved skills	1	0,7%	Effort expectancy
improved usability	1	0,7%	Effort expectancy
instructional video	2	1,4%	Effort expectancy
learning to use it	3	2,1%	Effort expectancy
more understanding	3	2,1%	Effort expectancy
need more information	18	12,5%	Effort expectancy
same functionality	2	1,4%	Effort expectancy
accessibility	1	0,7%	Facilitating conditions
better device	2	1,4%	Facilitating conditions
connectivity issues	1	0,7%	Facilitating conditions
deleting ads	1	0,7%	Facilitating conditions
device space	2	1,4%	Facilitating conditions
have resources	2	1,4%	Facilitating conditions
have limited internet access	7	4,9%	Facilitating conditions
interoperability	2	1,4%	Facilitating conditions
no data	8	5,6%	Facilitating conditions
load shedding	1	0,7%	Facilitating conditions
no MIM alternative	21	14,6%	Facilitating conditions
no VPN	1	0,7%	Facilitating conditions
Wi-Fi access	1	0,7%	Facilitating conditions
no interest	3	2,1%	Hedonic motivation
integration into course	2	1,4%	Performance expectancy
affordability	2	1,4%	Price value
academics need to use	2	1,4%	Social influence
becomes popular	3	2,1%	Social influence
increased users	11	7,6%	Social influence

Code	Grounded	Density	Code Groups
lecturer recommendation	1	0,7%	Social influence
tutors use it	1	0,7%	Social influence
better marketing	2	1,4%	Use
choice	1	0,7%	Use
compulsory usage	1	0,7%	Use
consistent use	2	1,4%	Use
increase awareness	4	2,8%	Use
increased use	1	0,7%	Use
provided different information	2	1,4%	Use
training provided	6	4,2%	Use
unsure	1	0,7%	Use
voluntary	1	0,7%	Use
won't use it	6	4,2%	Use
	144	100,0%	

Facilitating conditions were identified as the most prominent theme. A prevalent recommendation was that usage would improve if students did not have another MIM (14.6% of responses), such as WhatsApp, available. This finding is linked to student claims that use would improve if usage was compulsory and they did not have a choice. Evidence indicated, *"If I do not have access to Wi-Fi or data then that tool could come in handy]"*. Usage would also improve if students did not have access to the internet. Students remarked that they would use the Moya instant messenger if they did not have data. A lack of access to the university's virtual private network (VPN) that allows students to obtain internet access would also encourage usage.

"More knowledge on how it works and learning to use it". Students indicated that effort expectancy would improve if they were provided with more information regarding the data-free MIM. However, information on Moya was provided in the course outline and on the LMS. Training for using the Moya instant messenger, such as an instructional video or step-by-step instructions, was also recommended. The finding is surprising, as third-year Information Systems students are expected to have ample technical skills (Craffert & Visser, 2018), and Moya has the same interface design and functionality as the preferred WhatsApp (biNu, 2020) so learning to use the application should require minimal effort. Furthermore, the issue of a lack of compatibility with Apple devices has been resolved as there is now a version available on the Apple Store (Moya App Pty Ltd, 2022).

Students indicated that social influence would improve with an increased number of users, such as peers and tutors (7.6% of responses). However, Moya instant messenger has a rapidly growing user base with more than one million active users (Rajgopaul, 2019). Students suggested that lecturers use and recommend the data-free MIM as well: *"If lecturer consultations could happen via Moya Messenger or an alternative instant messaging app, that could be an improvement over email"*. The literature supports the recommendation that lecturers use MIMs to bolster meaningful student interaction (Rambe & Bere, 2013; Rosenberg & Asterhan, 2018).

"I simply will not use it". Hedonic motivation indicated that students had no desire to use the Moya MIM and that usage was impacted by students' refusal to use the data-free MIM for online peer tutoring. This could change if WhatsApp was no longer an option and all the necessary course information was provided exclusively on Moya. The finding is linked to the recommendation to improve performance expectancy by integrating the use of the Moya instant messenger into the course and the tool was consistently used for online peer tutoring.

Price value was evident as a student indicated, *"I feel that for people who struggle with funds for WhatsApp, this may be a very useful app"*. The use of a data-free application was recommended by a student who needed to purchase data when not on campus: *"Being off-campus and needing a zero-rated app because I cannot afford to buy data when I am off-campus"*. Two students (1.4% of responses) indicated a positive behavioural intention: *"Yes, I would consider using Moya Messenger in the future"* and *"I will try it out in the future"*.

8. Conclusion

This study aimed to investigate two questions: *Which factors affect students' use of a data-free instant messenger for online peer tutoring?* and *What would improve students' use of the data-free instant messenger?*

Drawing on the literature for the use of another MIM requiring data, WhatsApp, for educational purposes, seven factors from UTAUT2 served as the basis for this investigation. These factors explained how students did not use a data-free MIM and their negative attitudes towards the use of the Moya data-free instant messenger for online peer tutoring. The results indicate that using WhatsApp was habitual and therefore it remained the preferred MIM.

While price value was expected to be a significant factor due to this application not requiring data, this was not the case. Despite the comparatively high cost of South African mobile data, student preference for using WhatsApp may be due to the purchase of less expensive dedicated WhatsApp data bundles. WhatsApp bundles allow students to send attachments such as pictures and videos without incurring additional data charges. However, with the Moya MIM, sending attachments requires data. The findings may leave lecturers questioning whether using WhatsApp for online tutoring is the more viable option.

Due to the qualitative nature of the study and the investigation of a specific MIM in a specific context, study results may not be generalised to all South African tertiary institutions. The key learnings, however, may provide insights to improve the implementation of data-free MIMs within other contexts.

Future work may entail implementing the recommendations to improve the usage of the data-free Moya instant messenger. A study could examine the use of Moya instant messenger exclusively for online peer tutoring while not providing students with the option of an alternative, such as WhatsApp. The separation of using Moya exclusively for online peer tutoring or educational purposes and WhatsApp for social purposes may lead to improved learning outcomes.

Acknowledgment

The financial assistance of the National Research Foundation (NRF) towards this research is hereby acknowledged. Opinions expressed and conclusions arrived at are those of the author and not necessarily attributable to the NRF.

References

- A4AI. 2018. 2018 Affordability Report. Available at <http://1e8q3q16vyc81g8l3h3md6q5f5e-wpengine.netdna-ssl.com/wp-content/uploads/2018/10/A4AI-2018-Affordability-Report.pdf> [Accessed 25 August 2020].
- Ajuwon, A., Pimmer, C., Odetola, T., Gröhbiel, U., Oluwasola, O. & Olaleye, O. 2018. Mobile instant messaging (MIM) to support teaching practice: insights from a nurse tutor program in Nigeria. *Malawi Medical Journal*, 30(2):120-126. DOI: 10.4314/mmj.v30i2.12.
- Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50:179-211. DOI: 10.1016/0749-5978(91)90020-T.
- Alenazi, A.A. 2017. WhatsApp Messenger as a Learning Tool: An Investigation of Pre-service Teachers' Learning without Instructor Presence. *Journal of Education and Training Studies*, 6(1):1. DOI: 10.11114/jets.v6i1.2684.
- Annese, S., Amenduni, F., Candido, V., McLay, K.F. & Ligorio, M.B. 2022. Tutor's Role in WhatsApp Learning Groups: A Quali-Quantitative Methodological Approach. *Frontiers in Psychology*, 12(March): 1-14. DOI: 10.3389/fpsyg.2021.799456.
- Arco-Tirado, J.L., Fernández-Martín, F.D. & Hervás-Torres, M. 2019. Evidence-based peer-tutoring program to improve students' performance at the university. *Studies in Higher Education*, 45(11):2190-2202. DOI: 10.1080/03075079.2019.1597038.
- Awotunde, J.B., Ogundokun, R.O., Ayo, F.E., Ajamu, G.J., Adeniyi, E.A. & Ogundokun, E.O. 2020. Social Media Acceptance and Use Among University Students for Learning Purpose Using UTAUT Model. In *Advances in Intelligent Systems and Computing*. V. 1050, 91-102. Switzerland: Springer Verlag. DOI: 10.1007/978-3-030-30440-9_10.
- Barhoumi, C. 2015. The Effectiveness of WhatsApp Mobile Learning Activities Guided by Activity Theory on Students' Knowledge Management. *Contemporary Educational Technology*, 6(3), 221-238 DOI: 10.30935/cedtech/6151.
- Barhoumi, C. 2017. Analysis of technological, individual and community factors influencing the use of popular Web 2.0 tools in LIS education. *Electronic Library*, 35(5):977-993. DOI: 10.1108/EL-03-2016-0069.
- Bere, A. 2014. Exploring determinants for mobile learning user acceptance and use: An application of UTAUT. In ITNG 2014 – Proceedings of the 11th International Conference on Information Technology: New Generations. IEEE Computer Society, 84-90. DOI: 10.1109/ITNG.2014.114.
- Bere, A. 2019. Understanding mobile learning using a social embeddedness approach: A case of instant messaging. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 15(2):132-153.
- Bharati, V.J. & Srikanth, R. 2018. Modified UTAUT2 model for m-learning among students in India. *International Journal of Learning and Change*, 10(1):5-20. DOI: 10.1504/IJLC.2018.089532.
- biNu. 2020. #datafree Moya Messenger App. Available at <https://www.datafree.co/moya-messenger-app> [Accessed 24 April 2020].

- Carlana, M. & La Ferrara, E. 2021. Apart But Connected: Online Tutoring and Student Outcomes During the COVID-19 Pandemic. *IZA Discussion Paper No. 14094*, 1-48. DOI: 10.2139/ssrn.3785058.
- Coetzee, D., Lim, S., Fox, A., Hartmann, B. & Hearst, M.A. 2015. Structuring interactions for large-scale synchronous peer learning. In *CSCW 2015 – Proceedings of the 2015 ACM International Conference on Computer-Supported Cooperative Work and Social Computing*, 1139-1152. DOI: 10.1145/2675133.2675251.
- Craffert, L. & Visser, K. 2018. Western Cape Digital Skills Shared Agenda for Action. Available at <https://bit.ly/3HMmFvi> [Accessed 14 March 2020].
- Creswell, J. & Poth, C. 2007. *Qualitative inquiry and research design: Choosing among five approaches*, 2nd ed. Thousand Oaks, California: SAGE Publications Inc.
- Dar, Q.A., Ahmad, F., Ramzan, M., Khan, S.H., Ramzan, K., Ahmed, W. & Kamal, Z. 2017. Use of Social Media Tool “Whatsapp” in Medical Education. *Annals of King Edward Medical University*, 23(1). DOI: 10.21649/AKEMU.V23I1.1497.
- Davis, F.D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, 13(3):319-339. DOI: 10.2307/249008.
- Fernández Robin, C., McCoy, S. & Yáñez, D. 2017. Whatsapp. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*. 10283 LNCS:82-90. DOI: 10.1007/978-3-319-58562-8_7/FIGURES/2.
- Gon, S. & Rawekar, A. 2017. Effectivity of E-Learning through Whatsapp as a Teaching Learning Tool. *MVP Journal of Medical Sciences*, 4(1):19. DOI: 10.18311/mvpjms/0/v0/i0/8454.
- Healing, J. 2019. How do SA's data prices compare with the rest of Africa? *Eyewitness News*. Available at <https://ewn.co.za/2019/12/03/how-do-sa-data-prices-compare-with-the-rest-of-africa> [Accessed 08 July 2020].
- Hill, R.J., Fishbein, M. & Ajzen, I. 1977. Belief, attitude, intention and behaviour: An introduction to theory and research. *Contemporary Sociology*, 6(2):244. DOI: 10.2307/2065853.
- Johns, C. & Mills, M. 2021. Online Mathematics Tutoring During the COVID-19 Pandemic: Recommendations for Best Practices. *Primus*, 31(1):99-117. DOI: 10.1080/10511970.2020.1818336.
- Jones, A.H.G. 2019. Using the Theory of Reasoned Action To Examine Faculty Intentions To Use Social Networking in Distance Learning Courses. *The University of Alabama*. 1-61. Available at <https://bit.ly/3M5OHVg> [Accessed 31 July 2022].
- Lim, G., Shelley, A. & Heo, D. 2019. The regulation of learning and co-creation of new knowledge in mobile learning Recommended citation : The regulation of learning and co-creation of new knowledge in mobile learning Genevieve Lim * Dongcheol Heo. *Knowledge Management & E-Learning*, 11(4):449-484. <https://doi.org/10.34105/j.kmel.2019.11.024>
- Maphosa, V., Dube, B. & Jita, T. 2020. A UTAUT evaluation of WhatsApp as a tool for lecture delivery during the COVID-19 lockdown at a Zimbabwean University. *International Journal of Higher Education*, 9(5):84-93. DOI: 10.5430/ijhe.v9n5p84.

- Mihalyi, K., Van Wyngaard, C., Strachan, J. & Hülsmann, T. 2016. WhatsApp: "Going where the conversation is". In 9th European Distance and E-Learning Network Research Workshop, 109-116. Available at: <http://www.eden-online.orghttp://www.creativecommons.org/licenses/by/4.0/> [Accessed 31 June 2022].
- Misaghi, M., Tonioti, E., Batiz, E.C., Santos, A.J. Dos, Misaghi, M., Tonioti, E., Batiz, E.C. & Santos, A.J. Dos. 2021. WhatsApp as a Tool for Integration and Motivation in Distance Education. *Social Networking*, 10(3):29-43. DOI: 10.4236/SN.2021.103003.
- Motaung, L.B. & Dube, B. 2020. WhatsApp Messenger as a Mediating Tool in Times of COVID-19 for Enhancing Student Engagement in e-Tutorials at a Rural South African University. *Journal of Educational and Social Research*, 10(6):214-224. DOI: 10.36941/jesr-2020-0121.
- Mouton, J. 1996. *Understanding Social research*. South Africa, Van Schaik Publishers.
- Moya App Pty Ltd. 2022. Moya App. Available at <https://moya.app/> [Accessed 19 July 2022].
- Mpungose, C.B. 2020. Is Moodle or WhatsApp the preferred e-learning platform at a South African university? First-year students' experiences. *Education and Information Technologies*, 25(2):927-941. DOI: 10.1007/S10639-019-10005-5/TABLES/1.
- Muhammad, R. & Annamalai, N. 2021. Using Facebook and WhatsApp to Teach and Learn English : A Comparative Systematic Review. *e-JBL*, 4(1):16-41.
- Mzileni, P. 2020. How COVID-19 will affect students. Available at <https://mg.co.za/education/2020-04-23-how-covid-19-will-affect-students/> [Accessed 24 April 2020].
- Nawaila, M.B. & Bicen, H. 2018. WhatsApp as a tool for distance learning. *PONTE International Scientific Research Journal*, 74(1):1-27. DOI: 10.21506/j.ponte.2018.1.36.
- Nickow, A., Oreopoulos, P. & Quan, V. 2021. The Impressive Effects of Tutoring on Prek-12 Learning: A Systematic Review and Meta-Analysis of the Experimental Evidence. SSRN Electronic Journal. DOI: 10.2139/ssrn.3644077.
- Nogubha, M. & Mhlana, S. 2022. Effective Use of E-tutoring System: Social WhatsApp Messenger on Social Identity Development. In *Smart Innovation, Systems and Technologies*. V. 251, 729-737. DOI: 10.1007/978-981-16-3945-6_72.
- Nyasulu, C. & Dominic Chawinga, W. 2019. Using the decomposed theory of planned behaviour to understand university students' adoption of WhatsApp in learning. *E-Learning and Digital Media*, 16(5):413-429. DOI: 10.1177/2042753019835906.
- Odili, N. 2021. Awareness of the Use and Impact of Facebook and Whatsapp Among Undergraduate Students in Tertiary Institutions: A Review of the literature. *MBJLIS-Middlebelt Journal of Library and Information Science*, 19:151-158.
- Petersen, F. 2020. Towards Student Inclusivity during COVID-19: Testing the #datafree Moya Messenger. *Alternation – Interdisciplinary Journal for the Study of the Arts and Humanities in Southern Africa*, SP32(1):294-331. DOI: 10.29086/2519-5476/2020/sp32a12.
- Peterson, A.T., Beymer, P.N. & Putnam, R.T. 2018. Synchronous and Asynchronous Discussions: Effects on Cooperation, Belonging, and Affect. *Online Learning Journal*, 22(4):7-25. DOI: 10.24059/olj.v22i4.1517.

- Pimmer, C., Lee, A. & Mwaikambo, L. 2018. Mobile instant messaging: New knowledge tools in global health? *Knowledge Management and E-Learning*, 10(3):334-349. DOI: 10.34105/j.kmel.2018.10.019.
- Poon, A., Giroux, S., Eloundou-Enyegue, P., Guimbretière, F. & Dell, N. 2019. Engaging high school students in Cameroon with exam practice quizzes via SMS and WhatsApp. In Conference on Human Factors in Computing Systems – Proceedings. DOI: 10.1145/3290605.3300712.
- Raja, J.E., Low, K.O. & Lim, W.S. 2018. Peer tutoring in higher education—a pedagogical tool for student-centered teaching. *Proceedings of Conference on Association of Southeast Asian Institutions of Higher Learning 2018:1-7*. Available at <https://bit.ly/44FFFpm> [Accessed 12 June 2022].
- Rajgopaul, D. 2019. Data free alternative to WhatsApp, hits one million monthly active users in SA. Available: <https://www.iol.co.za/technology/data-free-alternative-to-whatsapp-hits-one-million-monthly-active-users-in-sa-31115674> [2020, April 24].
- Rambe, P. & Bere, A. 2013. Using mobile instant messaging to leverage learner participation and transform pedagogy at a South African University of Technology. *British Journal of Educational Technology*, 44(4):544-561. DOI: 10.1111/bjet.12057.
- Rambe, P., Chipunza, C. & Ng'ambi, D. 2020. Using WhatsApp for co-creation of learning resources: A case of a South African university. *The Journal for Transdisciplinary Research in Southern Africa*, 16(1): 1-15. DOI: 10.4102/td.v16i1.791.
- Rosenberg, H. & Asterhan, C.S.C. 2018. “WhatsApp, Teacher?” - Student Perspectives on Teacher-Student WhatsApp Interactions in Secondary Schools. *Journal of Information Technology Education: Research*, 17:205. DOI: 10.28945/4081.
- So, S. 2016. Mobile instant messaging support for teaching and learning in higher education. *Internet and Higher Education*, 31:32-42. DOI: 10.1016/j.iheduc.2016.06.001.
- Staff Writer. 2021. Cheapest WhatsApp data bundles in South Africa. Available at <https://mybroadband.co.za/news/cellular/405179-cheapest-whatsapp-data-bundles-in-south-africa.html> [Accessed 03 August 2022].
- Statistics South Africa. 2020. Mid-year Population Estimate 2019. *Statistics South Africa*. (July):24. Available at: <https://bit.ly/3VDLKP3> [Accessed 13 April 2022].
- Sun, Y., Wang, N., Guo, X. & Peng, Z. 2013. Understanding the acceptance of mobile health services: A comparison and integration of alternative model. *Journal of Electronic Commerce Research*, 14(2):183-201. Available at <https://bit.ly/42B2wRc> [Accessed 13 March 2020].
- Tang, Y. & Hew, K.F. 2017. Is mobile instant messaging (MIM) useful in education? Examining its technological, pedagogical, and social affordances. *Educational Research Review*, 21(November 2018):85-104. DOI: 10.1016/j.edurev.2017.05.001.
- Topping, K. 2000. Tutoring. Geneva. Available at <http://www.curtin.edu.au/curtin/dept/smec/iae> [Accessed 08 July 2022].
- Topping, K.J. 1996. The effectiveness of peer tutoring in further and higher education: A typology and review of the literature. *Higher Education*. 32, 321-345. <https://doi.org/10.1007/BF00138870>

Turrentine, P. & MacDonald, L. 2006. Tutoring Online : Increasing Effectiveness With Best Practices. *NADE Digest*, 2(2):1-10.

Udenze, S. & Oshionebo, B. 2020. Investigating 'Whatsapp' for collaborative learning among undergraduates. *Üsküdar Üniversitesi İletişim Fakültesi Akademik Dergisi Etkileşim*, 5:24-50. <https://doi.org/10.32739/etkilesim.2020.5.92>

University of the Western Cape. 2019. *UWC History*. Available at <https://www.uwc.ac.za/about/mission-vision-and-history/history> [Accessed 10 February 2021].

Vaismoradi, M., Turunen, H. & Bondas, T. 2013. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences*, 15(3):398-405. DOI: 10.1111/nhs.12048.

Venkatesh, Thong & Xu. 2012. Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36(1):157-178. DOI: 10.2307/41410412.

Venkatesh, V., Morris, M.G., Davis, G.B. & Davis, F.D. 2003. User Acceptance of Information Technology: Toward a unified view. *MIS Quarterly*, 27(3):425=478. DOI: 10.2307/30036540.

Yin, R.K. 2003. *Case study research : design and methods*. Thousand Oaks, California: SAGE Publications Inc.