

CAN MULTIPLE WHATSAPP GROUPS REDUCE MESSAGE FLOODING DURING THE COVID-19 PANDEMIC PERIOD?

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ABSTRACT

WhatsApp has been favoured by many educators and students as an online learning tool during the COVID-19 pandemic. Despite its' popularity in educational settings, the flooding of messages on group chats remains a challenge for teachers as well as students. Currently there is a gap in research when it comes to investigating the types of conversations that students have on such groups which is intended for teaching and learning purposes, as well as a possible solution with regard to the flooding of messages. The purpose of this study is to investigate the chats that make up redundant posts that are often experienced on WhatsApp groups as well as to see whether multiple WhatsApp groups for a subject may reduce the flooding of messages. For the purpose of this study, the conversations on WhatsApp of a complete online first-year statistics course at a South African university will be analysed by making use of a WhatsApp chat analyser app, ChatChart. The findings of this study revealed that students flooded groups mostly with university-related matters, for example test dates, learning material, WhatsApp links to other subjects at the university, lecturer information, as well as important information that was posted on the student portal and test marks. The creation of two additional WhatsApp groups reduced message flooding within the content group where subject content was posted, while the other two groups served as a "place" where students were allowed to interact with their statistics lecturer as well as each other to discuss university-related matters.

Keywords: WhatsApp, Online Learning, Chat chart, Chat analysis, Redundant posts

INTRODUCTION

The COVID-19 pandemic indicated a unique challenge to the educational systems as the teaching and learning process were changed from fact to face learning to online learning. Sun and Chen (2016) offer practical advice to people wanting to create online courses so that they may make informed decisions during the implementation phase. Based on their findings, the authors argued that "effective online instruction is dependent upon well-designed course content, motivated interaction between the instructor and learners, well-prepared and fully-supported instructors; creation of a sense of online community; and rapid advancement of technology" (GirikAllo, 2020, p. 3). WhatsApp fits this criteria very well and is one of the most popular apps to use as an e-learning tool during the COVID-19 pandemic. There is no denying that WhatsApp works extremely well during the pandemic as it allows students to learn and access learning resources at anytime from anywhere. Apart from its accessibility, affordability, as well as easy-to-use features, instructors are able to provide learners with resources in an accessible format and ensures effective communication by using technologies to deliver messages, videos, notes, and subject content. Research also indicates that e-learning and access to internet facilities are not accessible for many students worldwide. As such, the utilisation of WhatsApp as an e-learning tool shows promising results in mitigating this problem. In the prevailing situation of the COVID-19 pandemic,

WhatsApp can enrich the learning experience as students can contact their lecturers via WhatsApp regardless of physical distance, while instructors can make contact with learners at their own convenience. Furthermore, student engagement is crucial to student learning and satisfaction in online courses (Martin & Bolliger (2018, p.205).

Although WhatsApp has been favoured by many educators and students during the COVID-19 pandemic, it does have some challenges. One challenge of using WhatsApp in particular is the flooding of messages on group chats, as well as irrelevant content and messages that students post on such groups. Furthermore, a recent study indicates that students tend to be distracted by other notifications which is not related to content learning material on WhatsApp (Nihayati & Indriani, 2021, p. 51). Previous research indicates that excessive posts by students, often at inconvenient times, remains a problem when WhatsApp is used as an online learning tool. Although numerous strides have been made with regard to the use of WhatsApp as a popular e-learning tool, there is a gap in research when it comes to investigating the type of chats or conversations that students have on such groups which is intended for teaching and learning purposes, as well as a possible solution with regard to the flooding of messages on such groups. As such, the aim of this research is twofold: firstly, to investigate the chats that students have on WhatsApp groups in an educational setting, and secondly to determine whether the use of multiple WhatsApp groups may assist with the flooding of messages or any other redundant posts on such groups. For the purpose of this study, the conversations on WhatsApp of a complete online first-year statistics course at a South African university will be investigated by making use of a WhatsApp analyser app, ChatChart. To shed light on the problem statement, the following research questions were set.

Q1: What type of conversations do students have on WhatsApp groups?

Q2: Is there a difference in message flooding in group chats among three different WhatsApp groups?

The significance of this study is twofold. Firstly, the study seeks to add to the body of literature by focusing in on what is that students talk about that “flood” group chats. In other words, the type of conversations that students have on WhatsApp groups that were created for teaching and learning purposes. By knowing what students post or talk about on WhatsApp may provide a clearer understanding about the questions students have, the confusion they face, or even point to specific challenges within a university that needs urgent attention.

Secondly, recent research mentions the problem of message flooding on WhatsApp groups that are created for online learning purposes. However, little research has come up with a solution. This research advances previous research as it suggests a possible solution for this dilemma. In a quest to overcome the challenge of message flooding and redundant posts on WhatsApp groups, the intention of this article is to determine whether multiple groups on WhatsApp, each with specific goals and limitations, may assist by reducing the flooding of messages or any other redundant posts on such groups. With more than 200 students in a subject and too many messages it becomes quite difficult to organise such conversations. One way to overcome this problem is to create multiple groups on WhatsApp for a specific subject. Moore (1993) identified three types of interaction inherent for online courses to be effective: learner-to-content interaction, learner-to-instructor interaction, and learner-to-learner interaction (Martin & Bolliger, 2018, p. 206). In the context of this study, the lecturer created three different WhatsApp groups in a statistics-related module which is in line with all three types of interaction suggested by Moore (1993). The purpose of creating three different WhatsApp groups was to see if there is a difference among flooding of messages

among the groups, as well as to see what types of conversations students have on these groups. Providing clear examples of such groups in a specific subject, as well as observing students' behaviour on such groups, may fundamentally be a light in this dark tunnel.

With the increased utilisation of WhatsApp as an online learning tool during the Covid-19 pandemic, it is imperative to have an awareness about not only the advantages that this platform has to offer, but also its challenges, as well as possible solutions to overcome these challenges. This will ensure that educators can ultimately design their courses on WhatsApp in a way that is beneficial for both students as well as lecturers. The problems faced by e-learning impact educational institutions all over the world. As a result, the findings of this research may be of broad interest and could be useful to a global audience by providing some clear guidelines to other educators at higher education institutions.

Background to the study

The researcher, who is also the lecturer of an introductory statistics course at the Central University of technology (CUT), created a WhatsApp group at the end of March 2020 when the lockdown in South Africa started. All students that were registered for Quantitative Techniques at the university joined this group. Quantitative Techniques is an introductory statistics course and consists of two semester modules (QTH115 and QTH125). The lecturer completed the 2020 academic year successfully with this statistics group of students and found that WhatsApp definitely has potential to be used as an online learning technology. However, the lecturer noticed that the WhatsApp group often got flooded with redundant posts which included messages about other modules at the CUT, other university-related matters or just random chats and jokes. The researcher can therefore personally confirm that although the use of WhatsApp is encouraged as a supportive technology tool, it does have its disadvantages. This finding is also confirmed by previous research that point out similar concerns. For example, in a study by Al Fadda, Osman, and Metwally (2020), few students have expressed adverse opinions about the timing of some posts as well as redundant posts and excessive flow of messaging within the WhatsApp groups. In fact, Al Abiky (2020, p. 780) specifically points out that "other aspects or difficulties such as the possible educational loss or message flooding and time consuming associated with using WhatsApp should be investigated more in future research". To overcome this problem, the researcher decided to create three different WhatsApp groups for the new group of statistics students at the beginning of the 2021 academic year. The three WhatsApp groups represented the three types of interaction suggested by Moore (1993).

The first WhatsApp group was called QTH_Content and focussed on learner-to-content interaction. According to Moore (1993), "learner-to-content engagement is the process of intellectually interacting with the content, which can change a learner's understanding and perspectives" (Martin & Bolliger, 2018, p. 209). This type of interaction can occur when students are watching instructional videos, interact with multimedia, or search for information (Abrami, Bernard, Bures, Borokhovski, and Tamin (2011)). The first WhatsApp group was solely administered by the lecturer to post subject content and learning material, slides, lecture-made screencast videos, explanations, as well as important announcements and information. By using her own lecture-made screencast videos, the lecturer increased instructor visibility. On this group, only the lecturer was allowed to post content, and no students were allowed to send messages, chats or flood the group. The reason why the lecturer did not allow students to make comments or post messages on this group was because she wanted the content to stay neat without any comments or posts in between. This would also ensure no educational loss as all learning material was organised in one specific WhatsApp

group. So basically, this group acted like a ‘dropbox’ on WhatsApp where students could collect or download their statistics content for the subject Quantitative Techniques.

Students often want to enquire about content material, assignments or upcoming tests, and grades. As such, it makes sense that online instruction should also include opportunities for students to interact with their instructors. It is therefore important that when online courses are designed, they will allow instructors or lecturers to be present to interact with students. As such, the researcher created a second WhatsApp group, QTH115, which allowed learner-to-instructor interaction and to foster student engagement. On this group, students were allowed to collaborate with their statistics lecturer as well as each other in an interactive and cohesive environment (Martin & Bolliger, 2018, p.208; Dixson, 2010; Gayton & McEven, 2007). On this group all students could participate and were allowed to send messages regarding the statistics-related module Quantitative Techniques. For example, students could ask questions about the videos or slides that was posted by the lecturer on the first group (QTH_Content). The lecturer (also the researcher) interacted frequently with students on this group.

Finally, learner-to-learner engagement is extremely valuable for building activities that enhance student engagement. With regard to WhatsApp as an online learning tool, chat sessions can promote student-to-student interaction among WhatsApp groups. As such, the researcher created a third WhatsApp group that focussed on learner-to-learner interaction. This group was called 2021_Students, and on this specific group, students were allowed to interact on matters not related to only the statistics module. On this group, students were allowed to have informal conversations, share important announcements or information about other subjects at the CUT, as well as urgent matters related to the university. This group ensured effective social-networking activities in this mode of mobile online learning for increased student engagement.

In the next section, the researcher gives a short overview about online learning during the COVID-19 pandemic. Thereafter, the focus is on WhatsApp during the pandemic as well as the benefits of using this popular app in online teaching and learning.

LITERATURE REVIEW

Online learning during the Covid-19 pandemic

Since the COVID-19 outbreak in December 2019, most higher education institutions throughout the world have been impacted in terms of how they continue their teaching and learning activities. Not only did the pandemic cause far-reaching and persistent changes in all world systems, but one of the pandemic's most significant implications was in the sphere of education. Although online teaching and learning had entered education prior to the COVID-19 outbreak, it was more of a recommendation or desire than a need. Due to the ongoing restrictions of the COVID-19 pandemic, most universities and educational institutions continued the 2021 academic year by making use of online learning activities. According to Bahasoan, Ayuandiani, Mukhram, & Rahmat (2020, p.101), the use of information technology is critical in the implementation of distant learning. As such, many educators turned to information and communication technologies (ICTs) in an attempt to fit the new mode of teaching and learning.

In a recent study, Mukhtar, Javed, Arooj, and Sethi (2020) investigated the perceptions of teachers and students regarding the advantages, limitations and recommendations from online learning during the COVID-19 pandemic at the University College of Medicine in Lahore, Pakistan. The benefits of their research included the fact that distant learning was feasible

through online learning and that students could easily access teachers and educational materials. The use of lecture recordings also aided administrative responsibilities. Furthermore, student-centredness was encouraged during the lockdown period and students became self-directed learners.

Despite the fact that many educators support the use of ICT technologies during the Covid-19 lockdown period, research point out the weaknesses of such distance learning experiences. For example, a study by Soleman (2020) indicates that the lack of ICT proficiency has been one of the most salient difficulties encountered in this mode of teaching and learning for teachers and students in an elementary school of Israel's Arab sector. The study also showed that absence of computers at home or no internet connection resulted in technical difficulties. In an attempt to overcome this problem, many educational institutions started to make use of mobile learning as many people all over the world, including students, mainly make use of their mobile devices to communicate with each other. According to Biswas, Roy, and Roy (2020), mobile learning is particularly beneficial in bridging the study gap caused by the COVID-19 epidemic. Furthermore, by focusing on the function of mobile learning as a distant teaching and learning strategy during the COVID-19 pandemic, Naciri, Baba, Achbani, and Kharbach (2020) demonstrate that mobile learning is an inescapable alternative during the pandemic. Research also shows that the use of mobile technology in online learning may lead to innovation in language learning across different environments (Seaman & Tinti-Kane, 2013; Shanmugapriya & Veerakumar, 2016).

WhatsApp during the Covid-19 pandemic

The most popular chat application for fast communication is WhatsApp, which is embraced by many people all over the world to network or to exchange information. Due to the lockdown restrictions that the COVID-19 pandemic brought upon, "social networking sites play a definite role in our lives" (Al Fadda, Osman, & Metwally, 2020, p. 1024). With the support of data services, the WhatsApp application offers consumers many enticing features that can be used to connect with others, such as "text messaging, group chat, voice and video calls, photos and videos, document sharing, and links to web address" (Wijaya, 2018, p. 47). Other features include group chats in which up to 257 users can be added, the unlimited number of messages of multiple types such as images, voice notes or videos, and files (Rambe&Bere, 2013; Al Abiky, 2020, p. 775). Even more appealing is the fact that the WhatsApp application allows that more information can be obtained in real time, and digital information sharing is both convenient and instantaneous (Fogg 2010). Apart from the fact that WhatsApp is a familiar social media app that is very easy to use, it also does not require a large data quota package (Wargadinata, Maimunah, Eva,& Rofiq,2020, p. 150). The next section focuses on the benefits of WhatsApp as an online learning tool during the Covid-19 pandemic.

The benefits of WhatsApp as an online learning tool during the Covid-19 pandemic

WhatsApp Messenger, in addition to being an outstanding communication tool, is also a fantastic learning tool that aids in the learning process (Susilawati&Supriyatno, 2020, p. 853). "Social media-based learning technologies such as WhatsApp offer modern and creative ways to build engaging, effective, and interactive social learning environments. Social media platforms can also trigger and increase interaction between teachers and students" (Sri Bina, Ramadhani, Andhany, &Wardani, 2021, p. 406). Because of its user-friendly qualities, several educators organised their learning and group interactions by making use of WhatsApp to assist online learning, especially as it expanded the learning environment during the COVID-19 lockdown period. According toBina, Ramadhani, Andhany, &Wardani (2021, p. 407) "learning via WhatsApp is carried out through WhatsApp groups which can

accommodate many students (users) which makes it easier for teachers to provide learning and conduct discussions”. What makes this app so appealing for online teaching and learning is the low cost of this app (compared to computer-based learning platforms), easy accessibility, and availability of the lecturer (Alzubi & Singh, 2018). In an educational context, WhatsApp provides numerous benefits, such as “direct access to lots of online resources, more focus on students’ creativity, autonomy, and responsibility on one’s own learning” (Gon & Rawekar, 2017, p. 20).

The efficacy of WhatsApp to enhance the teaching and learning process has been well documented over the past few years, for example, how it supports blended learning courses (Barhoumi, 2015); how it serves as a convenient tool for teaching and learning activities (Gon & Rawekar, 2017); how it fosters connectedness in students’ online experience (Stone & Logan, 2018); how it allows for interaction and reflection among students (Alshareef, 2018); Baguma, Bagarukayo, Namubiru, Brown, & Mayisela, 2019); how it supports development of Higher Order Thinking Skills (HOTS) due to its affordances such as ubiquity (Baguma, Bagarukayo, Namubiru, Brown, & Mayisela, 2019); as well as how it ensures collaboration and participation among students (Barhoumi, 2015; Rambe & Bere, 2013; Vorderer, Kromer, & Schneider, 2016). As Barhoumi (2015, 223) purports: “WhatsApp Instant Messaging promotes online collaboration and cooperation between students who study online”. Research also shows that WhatsApp has a positive influence on students’ academic performance (Tarighat & Khodabakhsh, 2016).

WhatsApp has been favoured by many educators and students during the COVID-19 pandemic (Al Fadda, Osman, and Metwally, 2020; Wargadinata et al., 2020; Susilawati & Supriyatno, 2020). The benefits of using WhatsApp especially during the COVID-19 lockdown period have also been well documented (Al Fadda, Osman, & Metwally, 2020). For example, Susilawati & Supriyatno (2020) investigated the learning process in the middle and post-pandemic era of COVID-19. Their study showed that there was a significant increase in student learning outcomes as well as learning motivation before and after using WhatsApp. Bahasoan, Ayuandiani, Mukhram, and Rahmat (2020) investigated the effectiveness of online learning during the COVID-19 pandemic. The results of their data analysis obtained from students’ questionnaires showed that “the most suitable application to use during online lectures is WhatsApp because it is felt to be cheaper and commonly used”. A study by Yensy (2020) also showed that the use of WhatsApp Group media is quite effective when viewed from student learning outcomes in a Mathematics Statistics Course at Benkulu University. What made WhatsApp so influential for students is that “it acted as a forum for questions, a platform for collecting links holding discussions and asking questions on the material they did not attend at real time or did not fully understand, and a space for collaborative work” (Al Fadda, Osman, & Metwally, 2020, p. 1024).

Furthermore, research shows that WhatsApp groups contribute significantly in helping students to communicate actively while encouraging meaningful learning among users (Jain & Rahman 2016), and even more so during the COVID-19 pandemic (Wargadinata et al., 2020; Susilawati & Supriyatno, 2020). This makes sense, as students in a WhatsApp group can easily share “learning objects through comments, texting and messaging” (Barhoumi, 2015, p. 223). As a result, learning could take place optimally because lecturers and students are able to communicate with one another and share voice notes, videos, word documents, JPGs, PowerPoint files, as well as other links to resources (Wargadinata et al., 2020, p. 141). It therefore makes sense that “there may be merit in lecturers and learning technologists that encourage the formation of social media groups, pointing out the benefits for building connectedness and in turn, a learning community” (Stone & Logan, 2018, p. 52).

The literature review clearly demonstrated that WhatsApp has all the features to support learner-to-content interaction, learner-to-instructor interaction, as well as learner-to-learner interaction as suggested by Moore (1993). Although the use of WhatsApp is encouraged as a supportive technology tool, research does point out some concerns such as redundant posts and flooding of messages within WhatsApp groups (Al Fadda, Osman, and Metwally, 2020). To determine whether the creation of three different WhatsApp groups, each in line with the three types of interaction suggested by Moore (1993), may reduce flooding of messages on group chats, one has to investigate WhatsApp chat analysing tools and applications, which is discussed further on.

WhatsApp chat analysing tools and applications

Smartphones have grown in popularity throughout the world over the previous decade. As a result of this advancement, the number of individuals utilising mobile messaging applications such as WhatsApp has expanded significantly. To learn more about how individuals interact on WhatsApp, researchers started to statistically evaluate these anonymised chats (Ravishankara, Dhanush, and Srajan, 2020). Chairunnisa and Benedictus (2017) analysed the use of emojis and emoticons in interpersonal communication of Blackberry Messenger and WhatsApp application users. The findings of their research suggest that emoji and emoticon have important roles in interpersonal communication to enhance the text message's meaning. Several other researchers analysed sentiments and emotions of WhatsApp chats by using the statistical tool, R programming (Joshi, 2019; Rupavathy, Belinda, Carmel Mary, Nivedhitha, & Abhinaya, 2018; Dahiya, Mohta, & Jain, 2020), while Reddy, Kowshik, Kumar, and Kumar (2020) analysed and predicted the emotion of WhatsApp chats using sentiment analysis. Schwind and Seufert (2018) explored the use of WhatsAnalyzer to analyse WhatsApp chats. This web-based service collects and analyses chat histories of the mobile messaging application WhatsApp. According to Schwind and Seufert (2018, p. 1), "the major asset of the service is that real communication data can be collected without the bias introduced by observing or surveying participants". The study of Schwind and Seufert (2018) stands out as they made use of a web-based service to collect and analyse chat histories on WhatsApp. Furthermore, the collection of real data without researcher bias, which is a threat when participants is observed or surveyed, are eliminated.

Although strides have been made with regard to the analysis of group chats on WhatsApp, the majority of research focuses on the use of emoticons and sentiment analysis among such chats. Little research focussed on the redundant posts in group chats and the flooding of messages on WhatsApp among students in higher educational settings, where the focus is on the type of conversations students have on such groups. Furthermore, little research is available that explores other web-based chat analysers apart from WhatsAnalyzer. Although Schwind and Seufert (2018) used WhatsAnalyzer to analyse chats on WhatsApp, numerous web-based services exist to analyse such chats, for example, Chatilyzer, Chatvisualizer, WhatsApp Analyzer, ChatAnalyzer, and Chatchart WhatsApp Analyser for Chat Statistics. After investigating some of these apps, the researcher decided to explore ChatChart as a possible WhatsApp analysing tool.

Chat Chart is an application to provide statistical analysis of any WhatsApp conversation (ChatChart, 2021). In order to obtain "chatistics", one simply has to export the group chat from WhatsApp to the ChatChart App. After the exported group chat has been analysed, ChatChart displays the statistical data with bar graphs. ChatChart as an analysis instrument in this research is discussed further on.

RESEARCH METHODOLOGY

Research design

The aim of this research was to investigate the type of conversations that students have on WhatsApp groups and whether there is a difference in group chats among three different WhatsApp groups in an educational setting. In order to get enough information about the research problem, an observational, descriptive design was used, together with a WhatsApp analysing application tool, ChatChart. In order to respond to the research questions, quantitative data was obtained in the form of descriptive statistics through the ChatChart application for all three WhatsApp groups. The descriptive research employed in this research used a quantitative research design by collecting quantifiable information to be used for statistical analysis. A quantitative approach was chosen for the study as the data that emanated from the WhatsApp analysing app were graded and as such, easily quantifiable. As the aim of this research is to describe the phenomenon that is being studied, descriptive research is ideal as it is concerned “with what rather than how or why something has happened” (Nassaji, 2015, p. 129). According to McCombe (2019), this type of research is very useful when the aim of the research is to identify characteristics, frequencies, trends, correlations, and categories.

Population

The population of the study were 257 students from a first-year introductory statistics course at the CUT. Quantitative Techniques is a compulsory introductory statistics course for all students who enrol for the Diploma Human Resources (QTH115C) and the Diploma Marketing (QTH115E) at the CUT. Both groups of students formed part of the study and were instructed by the same lecturer, shared the same textbook, slides, videos and learning material and wrote the same tests and exams. Both groups were also integrated on the same WhatsApp groups as well as the same digital online learning platform of the university (ethuto). The researcher followed a non-probability sampling strategy. For this study, a convenient sampling approach was used as participants were already available and formed part of the Quantitative Techniques classes (McMillan & Schumacher 2006, 125).

Data collection

Data was collected for all three WhatsApp groups by means of the ChatChart WhatsApp content analyser app. The researcher exported the chats on all three WhatsApp groups and analysed the chats during December at the end of the 2021 academic year. Quantitative observation involved the objective collection of numerical data, in which the results were analysed using numerical and statistical methods. An advantage of this observational method allowed the researcher to gather data without having to rely on the honesty or accuracy of respondents (McCombes, 2019).

Instrument

In order to answer the research questions, the researcher considered it necessary to make use of ChatChart as an application to provide statistical analysis of any WhatsApp conversation (ChatChart, 2021). In order to obtain “chatistics”, one simply has to export the group chat from WhatsApp to the ChatChart App. After the exported group chat has been analysed, ChatChart displays the statistical data with bar graphs. Some interesting statistics about this app are summarised in Figure 1:

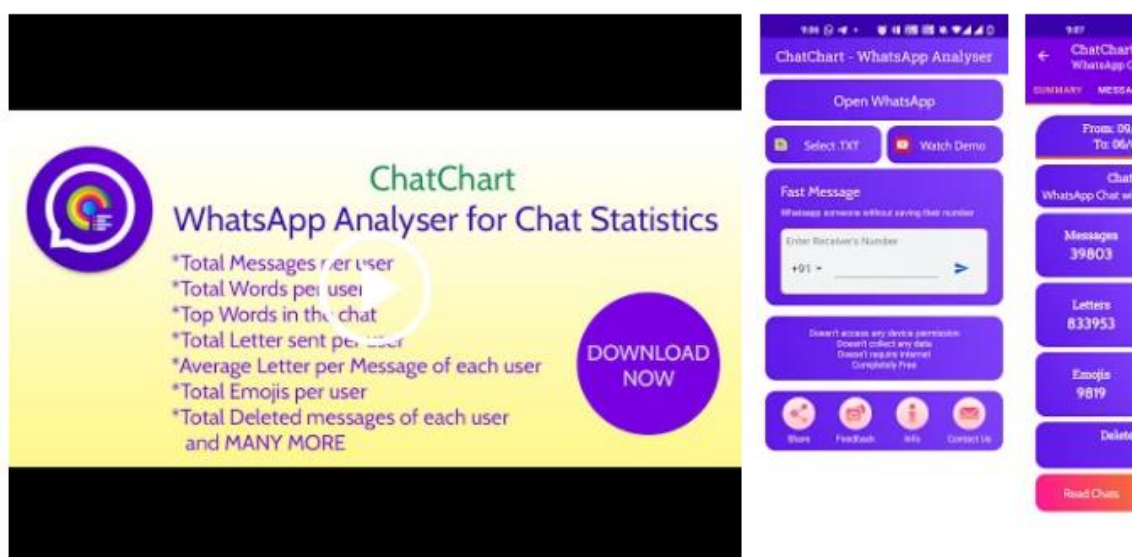


Figure 1. [ChatChart - WhatsApp Analyser for Chat Statistics - Apps on Google Play](#).

What makes ChatChart so attractive to use is that it does not require permissions to work, as the analysis is done in isolation, without access to the internet or device data. The research questions were:

Q1: What type of conversations do students have on WhatsApp groups?

Q2: Is there a difference in message flooding in group chats among three different WhatsApp groups?

DATA ANALYSIS

To answer the two research questions and analyse the chats on WhatsApp, the researcher exported the chats for each group to the ChatChart app. The data were then imported into the app for statistical analysis. Summary statistics are presented to give a general description of the chats that occurred on all three of the WhatsApp groups.

From Figure 2 it can be seen that the QTH_Content group had the least messages (396) of all three WhatsApp groups. The QTH115 group had 2456 messages, while the 2021_Students group had 11 550 messages during the 2021 academic year. The most media messages, emojis, as well as links were also shared on the 2021_Students WhatsApp group.

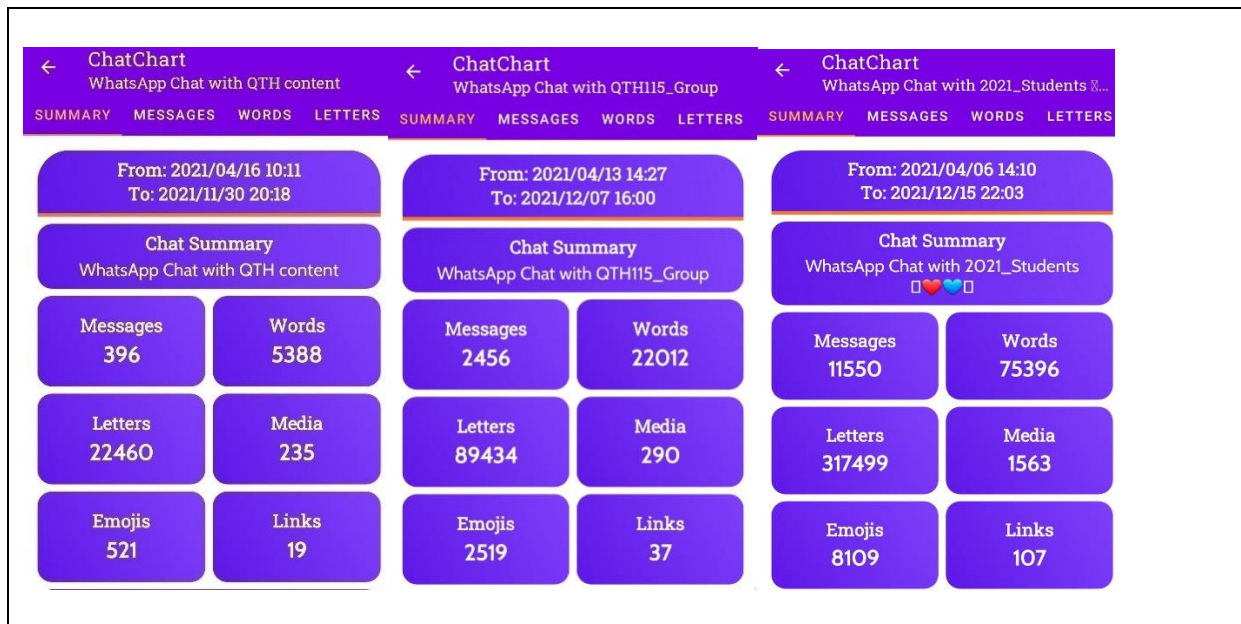


Figure 2. Chat summary statistics for all three WhatsApp groups.

Figure 3 gives an indication of what studentstalked most about on the two WhatsApp groups where students were allowed to interact with each other.

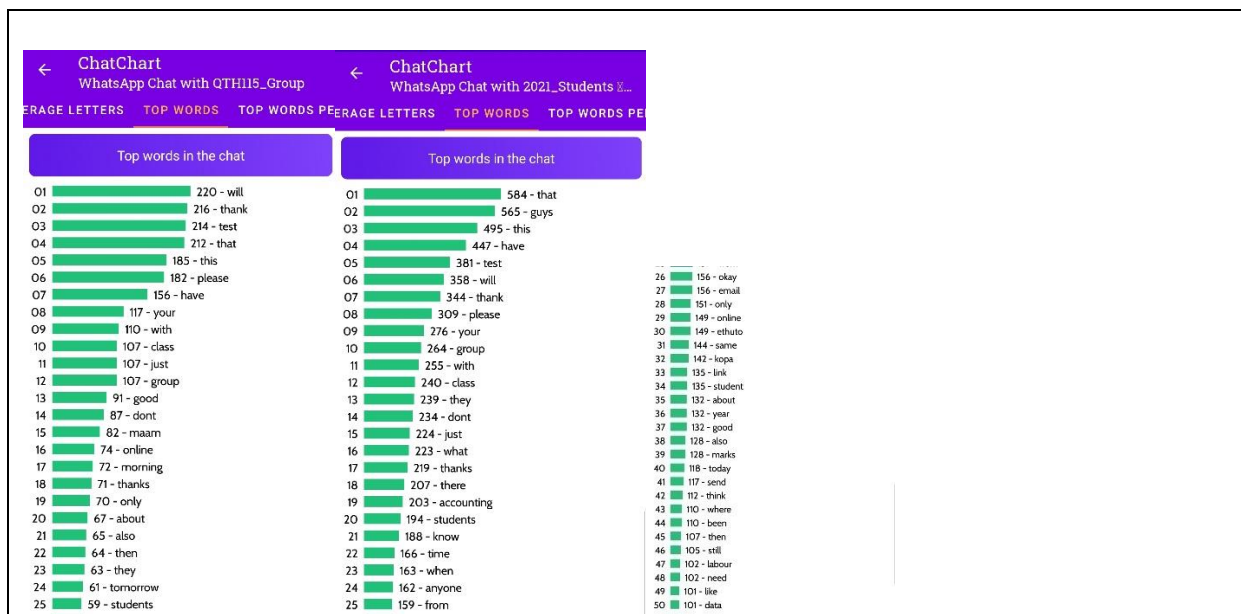


Figure 3. Top words used in each of the two interactive WhatsApp groups.

The top words from the QTH115 WhatsApp group were test, class, group, and online. Of course these words do not make sense on their own, but in the context of student’s messages, students were asking the following questions in the group:

- When are we writing test?
- What is the test about?
- Can someone on the group help me?
- Is the test going to be online?
- How late does the test open online?
- How late are we writing tomorrow?

- The word “class” appeared a lot because when the lecturer talked to her students she always greeted them with “hello class”.

The top words from the 2021_Students WhatsApp group were guys, test, please, group, class, accounting, email, online, ethuto, marks, labour, and data. From inspecting students’ conversations on this group, it became clear that students asked the following questions on this group:

- When students asked questions on this group, they started their sentence with “Hey guys”.
- When are we writing test?
- Can someone in the group please help me?
- Is there class today?
- Does anyone have contact details for the accounting lecturer?
- What is the email of the accounting lecturer?
- Notes are posted on ethuto (the student portal of CUT).
- The test is on ethuto.
- When are we getting our marks?
- Marks are posted
- What is the link to the WhatsApp group for Labour Law?
- When are we getting data?
- Has anyone received any data yet?

From students’ conversations on the 2021_Students WhatsApp group, it became clear that students asked a lot of questions with regard to tests, whether they have class, lecturer contact details in their Accounting module and information about their Labour Law module at CUT. Many students were confused whether these subjects were offered online or on campus and were seeking some clarity on the WhatsApp group. Students also did not know who their lecturer was and how to get hold of their lecturer. However, after asking these questions on the WhatsApp group the problem was quickly resolved. Students also informed each other when important information was shared on the CUT’s student portal (ethuto). Whenever marks appeared on the student portal, students informed each other on this WhatsApp group. Finally, data was a great concern among students. Students’ received monthly data bundles from the university to be able to study online. As soon as students received data, or ran out of data, they informed each other on the group.

Figure 4 shows the top emojis that were used in all three WhatsApp groups. The most used emoticon in this group was the “praying hands” emoticon, followed by the “love” heart emoticon. The lecturer showed a lot of compassion and love for her students on the QTH_Content WhatsApp group. Every time she posted learning material or videos on this group for her student, she used the “teacher” emoticon as well as many “hearts” to show her students that she cares for them. She often used the “clapping-hands” emoticon to encourage her students when she posted difficult work.

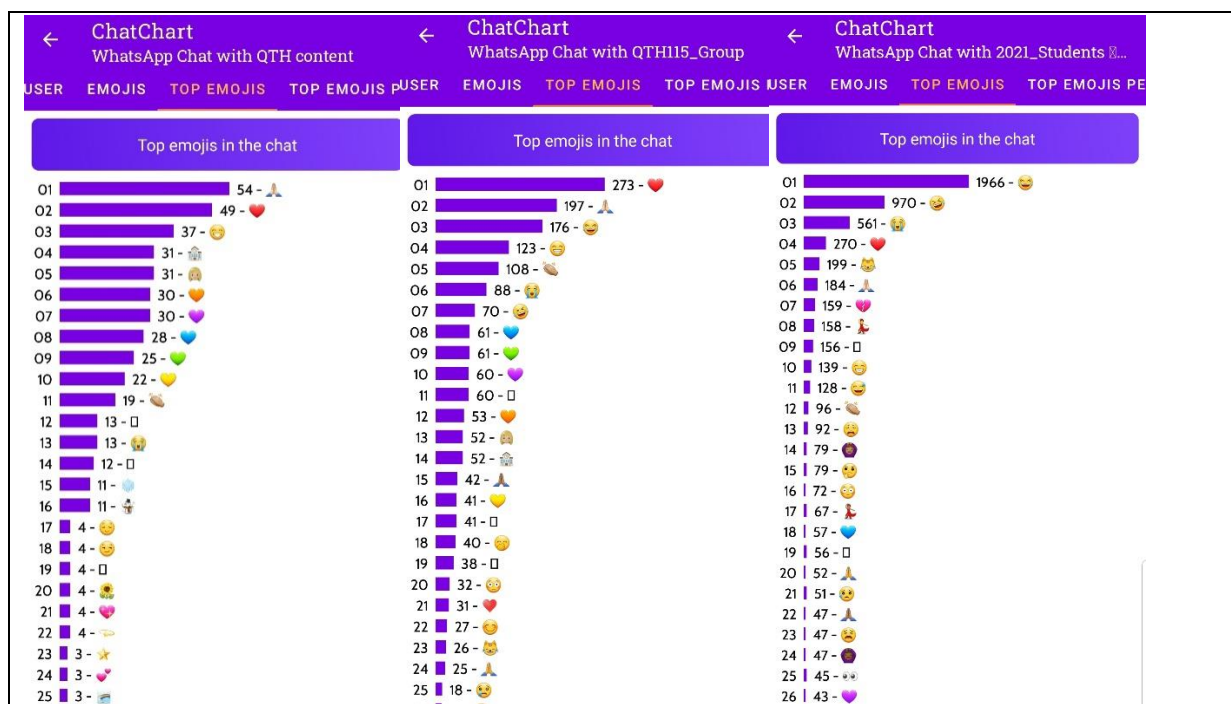


Figure 4. Top emojis used in each of the three WhatsApp groups.

The most used emoticon from the QTH115 group was the “love” heart emoji. Students showed a lot of love, appreciation and compassion for their lecturer on this group where they were allowed to interact with their lecturer in the first-year introductory statistics module. The second most used emoticon in this group was the “praying hands” emoticon. Students thanked their lecturer a lot when she posted videos or explanations on this group by making use of the “praying hands” emoticon. The third most used emoticon on this group was “laughter”. The lecturer has a very good sense of humour, and many jokes were shared on this group among herself and her students. The sixth most used emoticon was the “crying” emoticon. Students “cried” on this group when their lecturer posted difficult content or when they did not understand certain statistical concepts.

From the 2021_Students WhatsApp group it emerged that the top two emoticons were “laughter”. Students were generally happy to have light-hearted conversations on this WhatsApp group as well as joking with their fellow classmates. The third most used emoticon was the “crying” emoticon. Again, this points to students’ frustration with regard to difficult content, or upcoming tests in all subjects at the CUT. Students also cried when a test was difficult and were often shocked when they found out about an upcoming test which they were not aware of (see emoticon 16, 23 and 25). Other students were happy and “danced” when they performed very well in tests (see emoticon 17).

From Figure 5 it can be seen which days had the highest number of messages. After inspecting these days on each of the three WhatsApp groups, it emerged that students were most active when they were studying for upcoming tests and exams at the university.

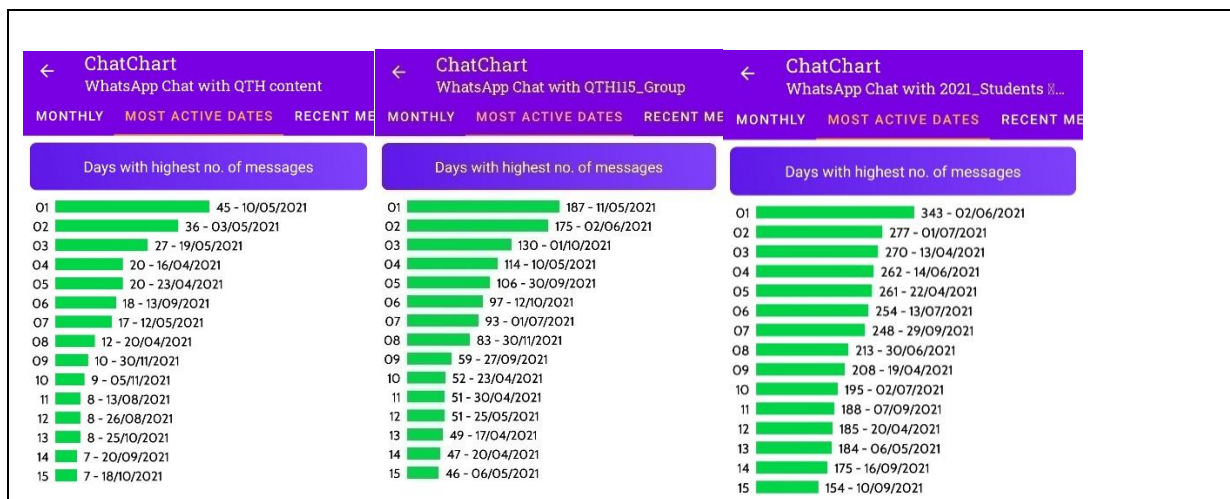


Figure 5. Days with the highest number of messages in each of the three groups.

Figure 6 shows the days of the week which were most active with regard to messages on all three WhatsApp groups. The lecturer posted all her learning material on Mondays. Therefore, Mondays had the most messages with regard to the QTH_Content group. Students were most active on Tuesdays on the QTH115 WhatsApp group. Reasons for this may be because students watched the videos the lecturer posted on Monday on the QTH_Content group, and started to ask questions about the content the following day, which is Tuesdays. Students were also most active on the 2021_Students group on Tuesdays. Students were not very active on all three groups over weekends.

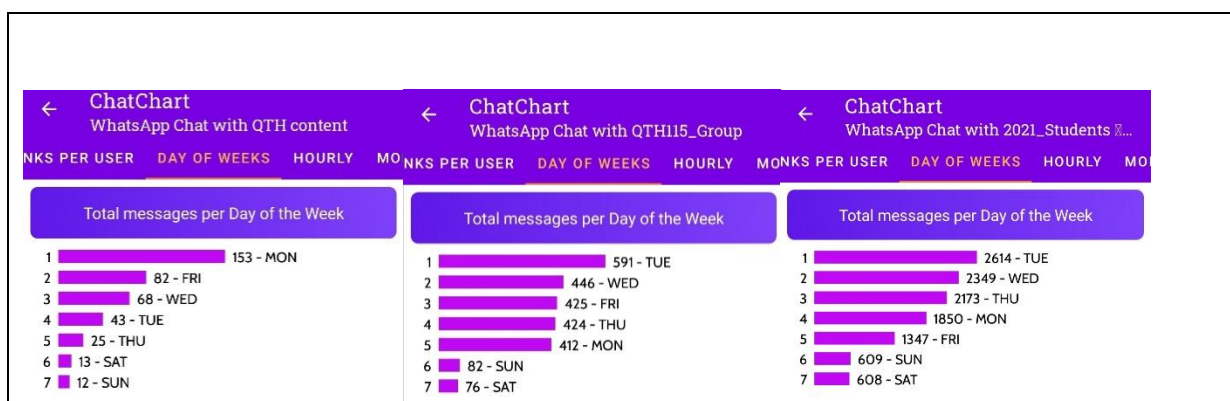


Figure 6. Most active days of the week for each of the three WhatsApp groups.

In the following section, the researcher discusses the data analysis as well as its interpretation.

RESULTS AND DISCUSSION

The findings related to the descriptive statistics of the WhatsApp groups are presented below. The first research question was: What type of conversations do students have on WhatsApp groups?

The WhatsApp groups not only served as a teaching and learning platform, but also as a platform where students could exchange important information with each other. Although many posts were redundant and annoying, the researcher noted that students mainly asked questions with regard to issues related to their different modules at the university. Students mostly used this group when they had questions to ask about who the lecturer of a specific

module was, the contact details of those lecturers, as well as links to other WhatsApp groups. Students shared important links, notes, test dates and reminders of assignments in other modules at the university on the 2021_Students WhatsApp group. Students were also confused whether certain subjects are offered on campus or whether they remain to be offered online, when lockdown restrictions were slightly lifted in South Africa. The WhatsApp groups served as a great source of information for students who felt lost as they were always assisted by other students, and quickly too. It is difficult to imagine how these students would have managed to get along, if it was not for these WhatsApp groups. The second research question was: Is there a difference in message flooding in group chats among three different WhatsApp groups?

Based on the quantitative results of the study, the following conclusions can be drawn. The WhatsApp group with the least redundant posts or flooding of messages from students was the QTH_Content group. This group allowed learner-to-content interaction, and the lecturer used this specific group only to post her own statistical content such as learning material and videos. The lecturer also set the chat settings to “admin only” which prevented students to post questions or comments between instructional material. This way, the learning material was all in place without any comments or flooding of messages. The second WhatsApp group, QTH115 provided a platform for learner-to-instructor interaction, where students were allowed to interact with the instructor and post comments or ask any questions with regard to their statistics module. From the quantitative results it can be seen that students participated very well on this group and seemed happy and pleased to be assisted by their lecturer. Students also collaborated with each other on this group. All messages were statistics related and many questions were answered for a lot of students on this group. Students also never complained about flooding of messages on this group, as many of their questions were already answered either by the lecturer, or other students. The 2021_WhatsApp group were the busiest of all three groups with also the most messages. Although this group were flooded with many messages and redundant posts at times, it did serve as a great source of information for general matters related to the university. Students assisted each other a lot on this specific group, and since students did not use this group for statistics-related questions, the flooding of messages did not bother the lecturer as well. From the results that emanated from this study, there was a significant difference between all three WhatsApp groups with regard to the frequency and flooding of messages.

CONCLUSION

The purpose of this study was twofold. Firstly, the researcher investigated what students talked most about that makes up redundant posts and flooding of messages that are often experienced on WhatsApp groups that are created for teaching and learning purposes. Knowing what students talked about on WhatsApp provided a clearer understanding about the questions they had during the 2021 academic year as well as the confusion they faced at a South African university. The findings of this study revealed that students flooded the 2021_WhatsApp group with university-related matters. These included messages about test dates, learning material, WhatsApp links to other subjects at the university, lecturer information, as well as important information that was posted on the student portal and test marks. When classes were still face-to-face before the COVID-19 pandemic, students could ask each other these questions on campus. Since online learning became the only mode of teaching and learning during the pandemic, students had no other means of communicating with each other than WhatsApp. What the findings of this research suggest is that, although flooding of messages may be annoying, students need a “space” where they can ask questions

or seek clarity about university-related matters. Secondly, the researcher created multiple WhatsApp groups to see whether it may reduce the flooding of messages or any redundant posts on such groups. This study provided clear examples of the conversations that students had on different WhatsApp groups and confirmed the need to create multiple groups on WhatsApp. The creation of three different WhatsApp groups, each supporting the three types of interaction that is inherent for online courses to be effective as suggested by Moore (1993), still allowed for a collaborative environment and opportunity for students to interact with the content, the lecturer as well as and fellow classmates. As a result, the learning experience of students are still enriched by offering an engaging mobile learning environment conducive to improve students' understanding of an introductory statistics course. The creation of two additional WhatsApp groups reduced message flooding within the content group where subject content was posted, while the other two groups served as a "place" where students were allowed to interact with their statistics lecturer as well as each other to discuss other university matters.

The findings of this research shed some light on potential enhancement for online learning through WhatsApp. Lecturers are encouraged to not only focus on one WhatsApp group where learning content is posted, but also to create a "safe" space where students are allowed to interact with their lecturer as well as each other and to ask any questions related to the university where they study. When such WhatsApp groups are created, it will provide students with opportunities where they can freely ask questions, assist each other, making new friends, as well as stay up to date on all university related matters. In this way, students will feel guided, supported, comforted and encouraged to continue online learning, despite all the challenges they have to face.

Although there are specific contributions to the study, there are certain limitations. The study took place in a South African context. However, the results of this research have clear significance to an international audience with broad recommendations on the adoption of WhatsApp as an online learning technology. At the end, we all want to create a feasible online environment in which students can study effortlessly online.

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