Science Students' Perceptions of the Use of WhatsApp, Read Aloud, and Tutor Scaffolding for Self-initiated Learning in a Discipline-specific Writing Course

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Abstract

Since 2009, WhatsApp has attracted approximately 400 million users per month, including university students. However, these students do not necessarily use such applications for academic purposes. This article focuses on a semester-long action study which garnered 32 science students' perceptions of the use of peer WhatsApp networking, read aloud and solicited tutor scaffolding as means of self-initiated learning in their foundation writing course. Principles of constructivism and connectivism consistent with students' transactional engagement in their writing development were applied to the research. Although some students believed that engaging with peers via WhatsApp groups was useful, the majority thought that reading aloud and self-correcting their writing in the presence of their tutor proved more advantageous. University writing facilitators should recognise that not all modern students' preferred mode of communication for educational purposes is via digital applications such as WhatsApp. Therefore, for best learner outcomes, they should consider balance when implementing innovative strategies.

Keywords: WhatsApp, self-initiated, engagement

IN THIS TECHNOLOGICALLY DRIVEN ERA, IT IS INCUMBENT on writing educators to plan and deliver university writing courses in ways that are appealing to their students, in particular, the Millennial Generation (1982–2002). Carter (2008) noted that "Millennials enter . . . university with expectations of streamlined communication environments,

networking opportunities with other novices and experts, immediate evaluative feedback, and a continually-improving use of multiple tools and resources" (25). Referring to these modern learners as "screenagers", Robb (2017) suggested that their preferred mode of communication is via their digital devices, including touch screen computers, smartphones and tablets. Screenagers are captivated by the attractive communication applications that are featured on these devices because they can transmit and receive information quickly. Screenagers use Short Message System (SMS) which allows them to use a maximum of one hundred and sixty characters, including abbreviations and emoticons, to send messages (Boştină-Bratu 2015; Ling 2010). In some instances, the use of these new technologies requires internet connection (Apuke and Iyendo 2018; Oblinger 2003). Internet connectivity is therefore a key commodity for screenagers. Wickramanayake (2018) reported that "On average, over 80 per cent of young Internet users are active across social media" (para. 7). WhatsApp is one such social medium.

The use of WhatsApp and other applications that are available on smart devices for scholarly endeavours such as academic writing, would not be possible without appreciable competence in certain skill sets. Milson-Whyte's (2015) description of academic writing reflects this:

> . . . "academic writing" [is] written scholarly discourse that academics produce in conformity with the conventions and expectations of their respective disciplines. Most of the knowledge creation and distribution in the academy takes place through such writing. Students – in their quest to increase their learning in new subjects – are expected to comprehend, evaluate, challenge and eventually produce such discourses in order to communicate effectively in writing in the university and beyond. (7)

This digital age demands even more of *iGeneration* university students (Dyer 2017) who pursue writing courses. Their tutors are therefore encouraged to invite their students to use modern technologies to facilitate their learning beyond the walls of the classroom.

This article focuses on a study which investigated a group of university science students' use of WhatsApp for self-initiated learning, read aloud and tutor scaffolding while they pursued their mandatory, discipline-specific writing course, Critical Reading and Writing in Science and Technology and the Medical Sciences (FOUN1014). Designed for students who pursue science-based majors and examined by coursework only, this semester-long course provides manifold opportunities for students to use a variety of strategies and resources to develop their critical reading, writing, thinking, listening, speaking and viewing skills in

inextricably connected ways. To achieve the best learner outcomes, students are challenged, to among other things, apply ethical principles when they summarise/paraphrase, evaluate and analyse science-related materials that they garner from a variety of sources to integrate into their compositions. They are required to use the process writing approach for all written assignments including a 1200-word documented/research essay.

For the documented essay, the students are required to read on their own, stimulus passages preselected by the course's team of facilitators from which they are supposed to choose an idea and shape it into a researchable narrowed topic. Having done that, they write a process paper of 300 words in which they explain the steps they followed to establish the focus of their essays. After that, they employ Blakeslee's Currency, Authority, Accuracy, Relevance and Purpose (CRAAP) Test (as cited in California State University 2019), for the evaluation of five to eight sources from which they gathered evidence to support the development of the thesis claims they formulated. They then create an outline for the essay for which they are instructed to use the Council of Science Editors (CSE) documentation style.

Conceptual Framework

The initial conceptualisation of the study is presented in Figure 1.
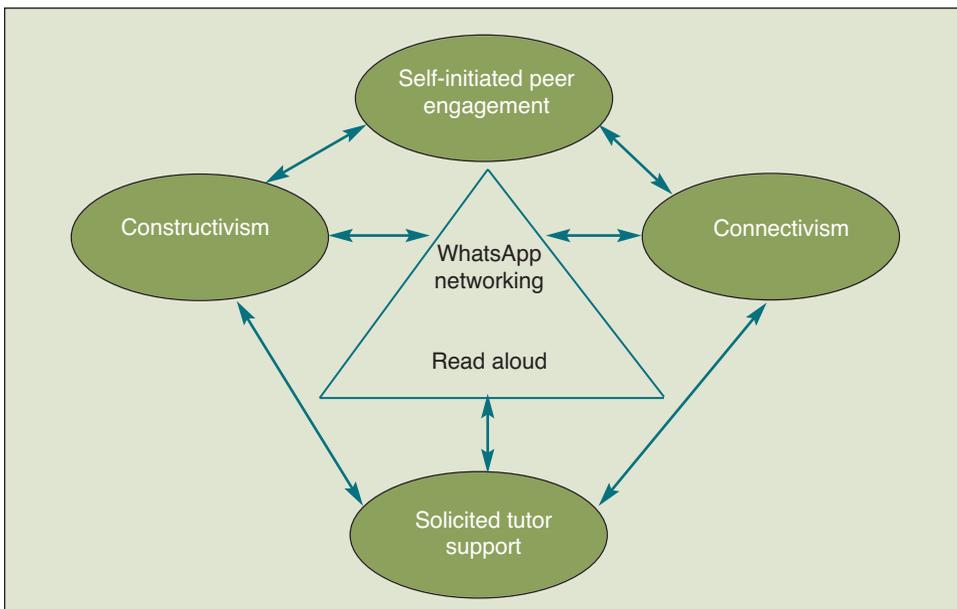

Figure 1. Conceptual framework

As portrayed in the graphic representation, this action research investigated the use of WhatsApp networking, read aloud, self-initiated initiated peer engagement and solicited tutor support as a combined strategy while they did FOUN1014. The study was grounded in the theories of constructivism and connectivism.

WhatsApp

WhatsApp is a modern-day innovation that was developed by Yahoo employees Brian Anton and Jan Koom in 2009, and since then, it has diversified communication in public and private spheres, worldwide (Barhoumi 2015). Barhoumi provided an extended description of this application:

> WhatsApp (from the English phrase "What's up?", meaning "What's new?") is an instant messaging application for smartphones. It allows users to exchange images, videos, and audio or written messages using their Internet connection. WhatsApp has positioned itself as a superior alternative to SMS messaging, which can be very expensive when used in foreign countries due to roaming charges; WhatsApp, in contrast, relies on the active Wi-Fi network. (222)

These features are economical, convenient and multi-functional. Also, WhatsApp users are able to create messages that use more characters than SMS (Garmiella and Tyson 2018). WhatsApp users are also able to insert their voices, images, music videos and other sounds as well as written attachments in their messages. It is no wonder that since its inception, WhatsApp has attracted approximately 400 million users per month of different age groups from across the global community (Bhatt and Arshad 2016; Mohanakrishnan et al. 2017).

WhatsApp is being used by professionals in different sectors. Tele-health also referred to as telemedicine, which includes the exchange of information in clinical settings via WhatsApp is being used by medical personnel (Giordano, Koch, and Labronici 2017; Tuckson, Edmunds, and Hodgkins 2017). Journalists are generating and disseminating news-related information accentuated by graphic representations via WhatsApp (Dodds 2019). Some facilitators at different levels of the education sector are experimenting with, and discovering ways of enhancing their classrooms delivery with WhatsApp. Bouhnik and Deshen (2014) investigated how teachers and students used WhatsApp to send and receive school-related messages. Gashegu et al. (2019) used it to engage Anatomy students in collaborative work. Barhoumi (2015) "explored the effectiveness of the blended learning process using WhatsApp learning activities to discuss questions posed by the online

instructor and related to classroom content" (236).

However, Collier (2014) stated that not all university students use digital/smart devices and their applications for educational purposes. When students use the WhatsApp application on smart devices, the main purpose is to connect and communicate with their "friends" and other people from diverse cultures to satisfy their leisure, pleasure, relaxation and entertainment desires, as well as to conduct online business transactions. Based on observation, business transactions that are popular among young people include the purchasing of fashion items such trendy apparel and hair extensions from China and Brazil, respectively.

Given the ease of access to WhatsApp, its flexibility in terms of the length of message that users compose as well as its affordability, versatility and appeal to young people, it has the potential of being purposefully utilised by university students in their academic writing. However, writing facilitators as well as students have to be mindful of potential challenges. WhatsApp is made possible because of Internet connectivity, a telecommunication service that requires sustainable infrastructural and financial and other support. Some university students might not have access to this service in their homes. Also, although universities that are located in developing countries provide Internet connectivity for their populations, reliable service is not always available. This has implications for equity and equal opportunity in access to Internet-driven education. James (2005) refers to this as the "digital divide".

Making the point that e-technology such as the use of WhatsApp has transformed traditional means of communication, and implying that this can have a negative impact on language use in academic contexts, Alsaman and Saeed (2017) explained:

> Due to the heavy use of the net in texting, emailing, chatting, and social networking, users tend to create their own language norms such as acronyms, abbreviations, contractions, reductions, coinages and other forms of language novelty. Such innovative uses of language are motivated by various reasons including speed, brevity and simplicity, among other reasons. However, while such innovative uses might be acceptable in certain contexts, they may not be sanctioned in some others. Academic settings are a case in point. (237)

While it is acceptable for university students to write fragmented ideas and shortened terms such as "ICYMI – In case you missed it", "IHDK – I honestly don't know" and OMG! – Oh my gosh/God!" in their informal WhatsApp written texts, these abbreviations are inappropriate for some academic engagements, such as the writing of documented/research essays, which require structure and accurate

use of language. These qualities of academic writing can be achieved through dedicated practice for, as Ramsay (2011) articulated, "Much writing begets good writing." Thus, in spite of the availability of glamorous, smart device applications such as WhatsApp, university students are still required to write to learn, and to learn to write (McLaren 2012) and for science students, there is no absolute because their field is diverse and varied. To illustrate, actuarial science majors are expected to write in particular ways as opposed to students who pursue degrees in any of the branches of chemistry: organic chemistry, inorganic chemistry, analytical chemistry, physical chemistry and biochemistry.

Therefore, science students' understanding of, and adherence to the conventions of academic writing that are applicable to their sub-disciplines are integral to the complex processes involved in the development of their academic literacies – particularly academic writing. It is important to note that even with the variations, some skills are central to science students' attainment of mastery in academic writing. In similar ways that students write to learn and learn to write at the university, they are also required to among other things, learn to read and read to learn at this level.

Read aloud

Since reading is vital to university students' development as academic writers, different types of this vital skill enhance their academic prowess, and this was instrumental to the conceptualisation of this study. It was with an understanding that read aloud, sometimes referred to as 'read out loud', provides opportunities for learners to listen to themselves and others engaged in oral reading, that it was utilised in the research. Although this strategy is mostly utilised in early learning (Pentimonti, Zucker, Justice, and Kaderavek 2010; Trealease 2006), it is appropriate for, and applicable to higher education. Aldridge (2019) postulated that, "Teaching in the university has always been associated with reading, or at least, reading aloud . . ." (38).

Having had the experience of reading aloud an advanced draft of my doctoral dissertation to Irving Seidman, Professor Emeritus of Qualitative Research and Secondary Teacher Education and Peter Elbow, Professor Emeritus of English at the University of Massachusetts respectively, I thought it would be worthwhile to discover the participating students' perceptions of this learner/peer/teacher activity in their writing course. Arkansas State University (2018) suggested that read aloud can be used from an efferent stance in literacy instruction. Rosenblatt (1988)

explained that when students read from an efferent stance, the main purpose is to extrapolate meaning. Thus, the reading is about engaging their minds. I wondered whether the students' learning experiences in the writing course would be enhanced if they engaged in the critical reading of their compositions to their tutor to solicit support and to benefit from constructive criticism. This kind of "student-centred" transaction augurs well for their active engagement in academic literacy development, an expectation of university education.

Based on the rewarding experiences I had reading aloud my dissertation to the two experts, in conceptualising this study it was intended to discover if, when the participating students read aloud their documented essays in progress to their tutor, they would identify, own and celebrate/accentuate the strengths of their essays. Similarly, I wondered whether they would detect weaknesses in their writing and then ask their tutor critical, self-initiated questions which would help her to provide timely and meaningful feedback (Cleary et al., 2018). The study also set out to determine if the students would thoughtfully consider their tutor's comments while making informed decisions when they revised their writing. This student-owned and tutor-supported activity is an affirming way of engaging students in their critical literacies development.

Self-initiated Peer Engagement

Self-initiated peer engagement is unsolicited effort made by students to enable their life-long learning as described by Tekkol and Demirel (2018):

> With lifelong learning, individuals can become aware of their own learning needs and they can decide how they want to reach knowledge. At the same time, they can understand the nature of knowledge instead of memorizing it. Lifelong learning enables individuals who seek self-development or further education to meet their learning needs independently and flexibly. With lifelong learning, these needs can be met anywhere both formally and informally. (2)

For self-initiated engagement in the study, students were expected to ask questions to clarify misconceptions, attend consultation to discuss their work, do self-critique and self-guided revision of their compositions, among other such mind-building activities. It was hoped that by informally participating in such activities in their seminar WhatsApp groups, the students would assume ownership of their learning and for this reason their writing tutor was excluded from the groups.

Solicited Tutor Support

Given the context of the course and the research, solicited tutor support is also a student-initiated action. It refers to any formal or informal attempt made by the students during their pursuit of FOUN1014 to ask their writing instructor questions or to seek help or clarification concerning any aspect of the course. The idea was that ideally, but not absolutely, students would consult with their tutor, only after they tried to self-resolve problems that emerged in their writing, or sought help from their peers as depicted in Figure 2.
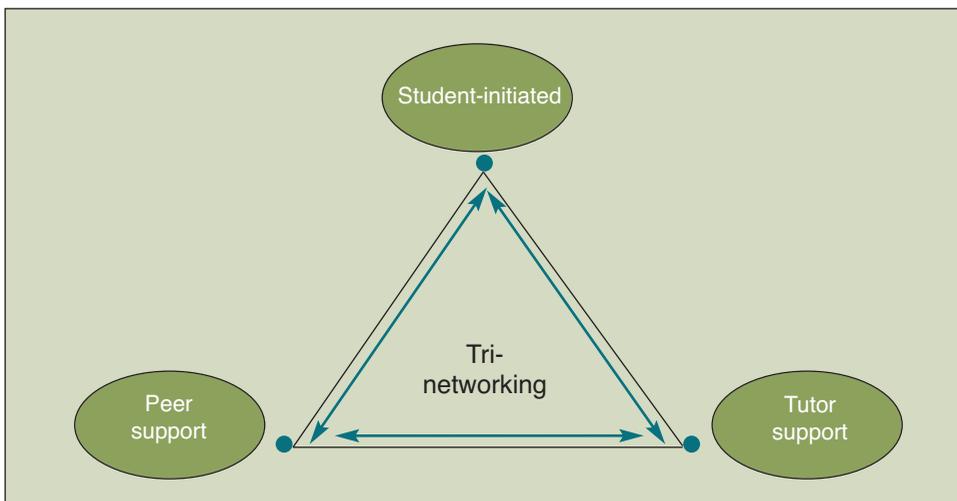

Figure 2: Triangular relationship in writing pedagogy

Essentially, the figure represents a three-way support system which required the participating students to engage actively in their writing instruction. I did a modification of Wood and Tanner's (2012) explanation of exemplary tutor support to indicate the intended reciprocal roles of the students and facilitator as applied to their academic writing in this action research:

- [Student identifies writing problem issue and attempts to resolve it single-handedly; if unable to resolve the issue, the student seeks help from peers and ultimately solicits support from the tutor at consultation].
- Tutor [listens to/views student's] problems [at consultation], asks questions, and provides occasional hints but little explanation.
- Student answers questions, works at problem solving, and engages actively in deliberate practice.

- Tutor focuses not only on content, but also on student's affective state, motivation, and metacognitive awareness.
- Student receives continual feedback . . .
- Tutor continually monitors student's understanding through questioning, knows student's level of understanding precisely, and can adjust strategy accordingly.
- Student is required to apply new knowledge to new situations and generalize it to other contexts.
- Tutor establishes rapport with student and encourages and supports the learning process.
- [Student is empowered and thereafter continues refining the drafts and repeats consultation visits as often as the need arises]. (6)

It was intended that the solicited tutor support, combined with peer support garnered via WhatsApp, would not only forge triangular relationships and improve the students' negotiating abilities, but also highlight the relevance of constructivism and connectivism to writing pedagogy.

Constructivism

Principles of constructivism were applied to this study because this theory, which is grounded in philosophy and psychology, proposes that learning is an interactive process that incorporates student/student and teacher/student interaction (Dennic 2016). Earlier theoretical works done on constructivism in the field of education suggested that students draw upon their experiences when they engage in face-to-face social interaction for the generation and sharing of knowledge (Dewey 1966; Vygotsky 1978). Social interaction as postulated by Dewey and Vygotsky has significance for students' development as writers because these theorists emphasised that learners are not passive receptacles who sit at the feet of their teachers and diligently wait to be filled with their erudite out-pouring; rather, as writers, they are active constructors of knowledge.

The social constructivist paradigm places students, their cultural realities and minds at the centre of all learning transactions. Like Dewey (1966), Vygotsky (1978) believed that interaction with significant others plays important roles in learning. In the case of this study, each student had the opportunity of engaging in social constructivism by interacting with and soliciting peer/tutor feed-back while they learned to write for academic purposes at the university level. Peer support

and tutor scaffolding are fundamental to university students' development as academic writers because some of them are challenged by the process' mental, physical and emotional demands (Cekiso, Tshotsho, and Somniso 2016; Pineteh 2013).

Connectivism

The development of connectivism as a theory is in its embryonic stage. Work done by Downes (2007), Goldie (2016), Duke, Harper and Johnston (2013), and Siemens (2005) proposed that in this technologically driven age, being connected to people and networks that exist in virtual and physical spaces, is a necessity for survival in different spheres of life. Siemens listed some principles of connectivism:

- Learning and knowledge rest in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. (sect. 6)

These principles are not new to the field of education. They symbolise well-established concepts of learning such as the importance of social interaction with others, manipulating non-human objects to make discoveries and to enhance learning experiences, assuming ownership and other types of active mental engagements in which students should participate to enable their learning. Dewey (1966) and Vygotsky (1978) emphasised the application of these principles to educational practices. The novelty that connectivism brings to today's writing instruction is the use of more advanced technology such as WhatsApp, which makes it possible for the teaching, learning and practising of writing as an art to take place in physical and virtual spaces. Establishing, nurturing and maintaining connections are characteristics that are central to the teaching and learning of writing in these

two spheres. Though some younger university students might find the digital touch aesthetically appealing, the mental, physical and emotional output that writing for academic entails will not disappear into oblivion. As NCTE (2005) articulated, "Young people are particularly adept at recognising creative applications for new technologies, but their in-school work should be guided by the wisdom and sophisticated curricular knowledge of their teachers" (sect. 6). Hence, the significance and timeliness of this study which sought answers to the questions that follow.

Research Questions

1. What were the students' initial responses to the use of WhatsApp as a tool for self-initiated learning in the writing course?
2. What were the students' perceptions of networking with their peers on WhatsApp about their research essays during the different stages of the writing process?
3. What were the students' perceptions of reading aloud their research essays in progress at consultations to their tutor during the different stages of the writing process?

The Research Context

From the outset, The University of the West Indies (UWI), Mona, like its counterparts in the USA required that all undergraduates, with the exception of those granted exemption, should do at least one foundation writing course. The writing courses are developed and delivered by the English Language Section of the Department of Language, Linguistics and Philosophy in the Faculty of Humanities and Education. In their historical accounts of the development and delivery of foundation writing courses, Dyche (2007) and Milson-Whyte (2015) disclosed that they were not mere grammar courses; they were concerned with students' critical engagement. Dyche wrote:

> Early syllabuses reveal a concern with critical reading via the analysis of various types of discourse and with the language and study skills needs of tertiary level students such as note taking from lectures and written texts, oral presentation for seminars, expository writing, statistical analysis and logical reasoning. (361)

Any attempt made at modifying these courses was aimed at improving students'

critical literacies. In the academic year 2012–2013, new faculty specific writing courses were introduced. It was reported that, "The design of the new Foundation courses arose from the department's proposal, developed by the English Language Section, for the enhancement of communicative competencies in the student population across disciplinary programmes at UWI Mona" (University of the West Indies, Mona 2012/2013, p. 61). FOUN1014 was designed for students who do degrees in the Sciences.

The Faculty of Science and Technology offers over 30 undergraduate degrees including "Actuarial Science, Medical Physics, Information Technology, Environmental Biology, Geology, Civil Engineering and Food Chemistry in the Departments of Biotechnology, Chemistry, Computing, Geography and Geology, Life Sciences, Mathematics, Physics, and the School of Engineering" (Faculty of Science and Technology 2019, Slide 6). Undergraduates who study in the Faculty of Medical Sciences pursue the following: "Bachelor of Science in Nursing, Advanced Diploma in Diagnostic Medical Ultrasound, Bachelor of Science in Diagnostic Imaging, Bachelor of Basic Medical Sciences, Doctor of Dental Surgery Programme, Bachelor of Science in Physical Therapy, Doctor of Pharmacy and Bachelor of Medicine, Bachelor of Surgery (MBBS)" (University of the West Indies n. d. a, para. 2). Despite their majors, one significant similarity is that all students are expected to do their foundation writing course during their first year, but this is not always the case.

Faculty from the English Language Section of the Department of Language, Linguistics and Philosophy usually do presentations at orientation sessions in which they emphasise to the Science students that the UWI requires all students to pursue foundation writing courses to enhance their writing and other critical literacy skills, so that they will become ideal graduates of the institution, capable of communicating effectively and transferring their knowledge to different contexts, and for multiple purposes (Milson-Whyte 2015; University of the West Indies n. d.a). Despite this, some students are not convinced that the course is significant to their chosen programmes/careers. Oftentimes at formal and informal general staff/course meetings and plenaries, facilitators mention remarks made by students, especially at the start of the semester, that writing is not essential to their chosen careers such as Medicine and Actuarial Science. Such remarks are misguided for as Taylor (2016) reiterated, "Writing, with all its complexity, within and beyond the academy, may be construed as a significant component of human resource that impacts efficiency, productivity, and competitiveness at the workplace and, by extension, national development" (125).

Purpose of the Study

It was with the foregoing context in mind that this study was conceptualised with the purpose of discovering whether the students' use of WhatsApp connectivity would engage them in self-initiated learning of the conventions of academic writing beyond the walls of the classroom. It also sought to garner the students' feedback on the support they solicited from their tutor at consultation sessions. It was also hoped that the insights from the research would inform my future writing pedagogical practice, especially when I am facilitating the writing development of modern-day students, and equip me to make meaningful contributions to on-going conversations on the teaching of writing at the university level.

Methodology

Drawing on aspects of qualitative and quantitative designs, this action study was conducted over twelve weeks.

The participants

Thirty-two undergraduate students from the Faculties of Science and Technology and Medical Sciences, who were pursing their mandatory writing course in the second semester of the academic year 2017–2018, participated in the research. There were 18 females and 14 males. These students chose to do the course during the seminar times that I was timetabled to teach and indicated their willingness to participate in the research by completing and returning the consent forms (see Appendix A for a copy of the consent form). Twenty-three of the participants were in the 17–20 years age range, and nine in the 21–25 group; 27 were from Jamaica and one each came from Trinidad and Tobago and Barbados. Details about their programmes are presented in Table 1.

Of the 32 participants, 29 (91%) were in the first year of their degree programmes, while one each (3%) was in the second, third and final year respectively. All of the students were doing the course for the first time. It is important to note that based on their schedules, the MBBS students at the UWI, Mona, are timetabled to do their foundation writing course in the second semester of the academic year; hence, the large representation of these participants.

Table 1. Participants and their majors (N=32)

Major	N	Percentage
Actuarial Science	2	6.3
Environmental Biology	1	3.1
MBBS	24	75.0
Microbiology	3	9.4
Nursing	1	3.1
Pure and Applied Science	1	3.1

Data sources

Qualitative and quantitative methods were used for the data collection. Qualitative data were collected from face-to-face conversations I had with the students at consultation sessions. These were recorded and transcribed over time in my computer-generated logbook. Observations made by the tutor throughout the semester were recorded in the logbook. A questionnaire was also administered to the students in May, at the end of the course. Prior to the actual administration, it was completed by four former FOUN1014 students (two males and two females), and based on their critical feedback, adjustments were made. The questionnaire comprised 21 items, inclusive of six open-ended questions and seven closed ones. The closed questions required the participants to use the Likert (1932) scale: Strongly Agree; Agree; Undecided; Disagree; and Strongly Disagree to respond to statements (*see* Appendix B).

Data collection

The data collection started in Week 2 of Semester II, January 30, 2018. By then students from my two seminars had created separate FOUN1014 WhatsApp groups to accommodate networking with each other as the course unfolded. Given the focus of the study, I deliberately excluded myself from the WhatsApp groups, but managed the data collection and storage. The students and I asked questions such as those listed below to initiate and guide the conversations at consultations, respectively.

Students' questions

1. Can you explain again what I should do with the stimulus passages?
2. Can you suggest ways in which I can make the claims in my thesis statement clear?
3. How can I revise the narrowed topic for my documented essay to make it researchable?
4. What can I do to improve the integration of information that I got from an article in my body paragraphs?
5. Can you explain when and how I should use et al. when I am using CSE referencing?
6. What should I do to include my voice in my documented essay?

Tutor's questions

1. What concern would you like to discuss today?
2. Based on the instructions what do you understand that you should do with the stimulus passages?
3. How are you progressing with the documented essay?
4. Which area(s) of your essay would you like to discuss today?
5. What has been your experience networking about FOUN1014 via WhatsApp with your peers?
6. Would you like to read aloud the parts of your essay that cause you the greatest concern?
7. What will you do to revise the areas that you identified?

Data presentation

The data are presented in numerical and prose forms as well as in tables. For ease of access and adherence to ethical considerations which guided the research process, each participant was randomly assigned a number ranging from 1–32. Anonymisation was done to protect the participants' identity (Thomson, Lana, Golden-Biddle, Trish, and Estabrooks 2005). As such, all perspectives recorded for the first student to whom a number was assigned, was labelled Participant 1. Also, to ensure the credibility and retention of the students' authentic voices, excerpts from their oral and written responses that are presented in the study were not modified (Sutton and Austin 2015; Tsai et al. 2016).

Data analysis

A step-by-step interpretive approach was used to extrapolate meaning from the participants' perspectives. First of all, I compiled the relevant student responses from the questionnaires into one large document. Secondly, I identified and sorted the information from the questionnaire, conversation and observation into two categories, qualitative and quantitative data (Miles, Huberman, and Saldaña 2014; Sutton and Austin 2015). After that, I engaged in inter-textual analysis (Mambrol 2016) and triangulation of the qualitative and quantitative data (Creswell 2014). For the inter-textual analysis, I read repeatedly the participants' perspectives that were presented in conversations and written numerical and non-numerical responses. To ensure balance, I then synthesised the convergent and divergent findings (Reeves et al. 2018). For example, when the majority of the participants said that they participated in the WhatApp group chat, that was categorised as convergent because it seems typical of the age cohort studied. The divergent findings include the fact that some of the participants did not respond favourably to the use of WhatsApp. The themes which emerged were "positive anticipation", "negative anticipation" "peer connectivity and learner support system", "face-to-face tutor scaffolding" and "intersection of virtual student support and physical tutor support".

Findings and Discussion

Students' initial responses to the use of WhatsApp as a tool for self-initiated learning

The participants' initial responses to the use of WhatsApp as a tool for self-initiated learning in their foundation writing course were broadly categorised as positive anticipation and negative anticipation.

Positive anticipation

The sixth item on the questionnaire asked the participants to write their initial responses to the use of WhatsApp as a means of engaging in student-initiated learning while they pursued FOUN1014. Of the 32 participants, 28 (87.5%) had positive anticipation. This included their enthusiasm about utilising WhatsApp, a modern, convenient, and user-friendly technology to generate and disseminate

course-related information among their peers, as exemplified in the following participants' responses:

Participant 2:

> My initial response was that it was going to be a great way of learning from each other, as it would facilitate ease of communication and quick responses from my peers where necessary.

Participant 7:

> I thought it would be a good medium for students to share and keep abreast of new developments in the course. I felt like the use my class' WhatsApp group as a means of getting the support of my peers would help me when I did the preparation for the writing of the drafts of my documented essay.

Participant 24:

> My reaction was that it was wise to use this mode of communication amongst classmates/peers. In an era of such technological advancement, the WhatsApp application which can be utilised by almost all smart phone owners, allows for easier access to information and smooth transfer of data. Therefore, it was the fastest way for my classmates and I to clarify information related to the Critical Reading and Writing course outside of our lectures and seminars.

Negative anticipation

However, the responses of two participants to Item 6 on the questionnaire were diametrically opposed to the foregoing positive perspective. Initially, some participants believed that the use of WhatsApp as a means of engaging them in student-initiated learning would not help them to yield the best learner outcomes for their foundation writing course. The following participants responded negatively.

Participant 20:

> At first, I thought that this method of communication would've proven ineffective because to me, it seemed that FOUN1014 was the type of course that would require face-to-face interactions with our teacher for the tasks that we were assigned.

Participant 23:

> Initially I thought that using WhatsApp for the purpose of networking school-related material was not going to go well because I believe that WhatsApp is typically an unprofessional social media platform. Although I knew that there was a group in which I could ask questions, I personally did not plan to utilise the platform because I was working with the idea that members in the WhatsApp group were students doing the course like myself and they might give an answer to my question as if they knew when they really did not know.

Considering that all of the participants were in the 17–25 years age range, a cohort that tends to be technologically savvy and or enthralled by "smart" applications (Apuke and Iyendo 2018; Oblinger 2003; Robb 2017), these negative responses are interesting. However, unlike Participant 10 who projected, "I was open to the idea as I believed that it would allow for fast and easy exchange of information about course matters among my peers," some students were not thrilled about the innovation. Although Collier's (2014) survey, which solicited students' views on what was expected of them in university writing, was administered in the USA, the following findings are not only relevant, but also significant to this study: "Students surveyed reported that they write a lot, at least 25 hours per week, though much of this writing is in the form of social media, which students don't consider "real writing . . ." (12). Like the writing facilitators mentioned by Collier, I was ". . . hopeful [I could purposefully] use students' facility with social media writing to help them understand how to master other forms" (12).

However, although digital connectivity such as that which has been made possible with the introduction of WhatsApp holds great promise in terms of diversifying writing pedagogy, there is the probability that some students might be dubious, or even resistant to its use for academic purposes. The forthright response that Participant 26 gave when engaged in a conversation about the usefulness of the WhatsApp student engagement during the semester should not be ignored. "Blind cannot lead blind, Miss" (Researcher's log). This participant held the belief that fellow FOUN1014 students had not yet developed sufficient mastery in academic writing to provide the kind of expert support that was needed for them to advise others.

Despite the legitimate concern voiced by the foregoing participants, meaningful student-initiated dialogue occurred when the majority of them used the WhatsApp platform to talk about their documented essays while they took them through the stages of the writing process.

One student who would rather like face-to-face writing classes also provided balanced perspectives on the future use of WhatsApp in the course:

Participant 11:

> Not everyone has access to WhatsApp and some people find their electronics distracting and like to separate themselves from their appliances while doing school work so these students would be at a disadvantage and faced with the need to adapt to changes. However, for the technology-savvy student who would find this medium convenient, WhatsApp would be beneficial.

This participant's views give credence to James' (2005) idea that lack of infrastructure and funding creates a digital divide. Thus, the use of WhatsApp and other innovative strategies in writing instruction at the university level, which require reliable Internet connectivity and adequate infrastructure could be affected. The last thing that a writing facilitator would wish to do is to use strategies that do not give students equal opportunities to learn.

Students' perceptions of the sharing ideas via WhatsApp at different stages of writing

The findings which were generated from the second research questions are presented and discussed in this section, under the theme "peer connectivity and learner support".

Peer connectivity and learner support

For Item 7 on the questionnaire, the participants were instructed to confirm the frequency of their WhatsApp usage while they composed their documented essays. These results are presented in Table 2.

Table 2. Frequency of students' WhatsApp usage (N=32)

Frequency	N	Percentage
As often as necessary	26	81.2
Weekly	3	9.4
Never	3	9.4

Table 3. Peer networking during writing process (N=32)

Stage of writing	N	Percentage
Understanding the stimulus passages	18	56
Formulating the research question	13	41
Formulating the subsidiary questions	11	34
Narrowing the topic	12	38
Formulating the thesis	5	16
Writing the attention grabber	3	9
Writing the introduction	3	9
Developing the body paragraphs	8	25
Integrating information from sources	28	87.5
Writing the conclusion	1	3
Compiling the list of references	15	47
Revising and editing	10	31

The fact that 90.6% of the students engaged in WhasApp networking with their peers is an indication that they assumed responsibility for their learning outside of the classroom. The participants' responses to Item 13 on the questionnaire, which asked them to select components of the documented essay in progress for which they got help by networking with their peers in their class' WhatsApp group, are tabulated in Table 3 above.

Though to different degrees, and bearing in mind that the predominant response to questionnaire Item 7 about the frequency of the students' WhatsApp usage was "as necessary" (see Table 2), the numbers presented in Table 3 indicate that student dialogue took place. Bakhtin suggested that when students talk about their writing, and that which is produced by their peers, it transforms them into more critically engaged learner writers (as cited in Richards and Pilcher, 2018). It is noteworthy that only 15.6 % of the students confirmed that they sought help from their peers when they were formulating their thesis statements. It was observed that the participants were less interactive at this stage of the writing process because they were preoccupied with deciding on the claims they would develop in their essays (Bylund 2017). This is usually the case, as I have discovered that students expend appreciable physical, emotional, and mental effort when formulating their thesis statements. It is one aspect of academic writing for which they usually request tutor support in call and at consultation.

Students' perceptions of reading aloud their essays-in-progress to the instructor

The findings that are presented and discussed in this section are linked to the third research question. They are organised based on the themes "face-to-face instructor support" and "intersection of virtual student support and physical instructor support."

Face-to-face instructor support

During their beginning university years, students yearn for support when they are required to adhere to the conventions of academic writing in their disciplines. The technicalities of documentation and analysis are apt examples. Appropriate, accurate and consistent use of documentation formats and extrapolating meaning from information gathered from sources and linking them to their academic writing can be daunting for many. It is therefore not surprising that they sought tutor support in those areas. Conversations with several students at consultation and during seminars and some of their responses to questionnaire items revealed that it was the first time that they were using the CSE documentation style; they were more familiar with the American Psychological Association (APA) format. Participant 15 attested to this in the response to Item 18 on the questionnaire:

> Overall, I think that the WhatsApp group was informative when it came to having further discussions about any misunderstanding that anyone had in the lectures and seminars, especially about the CSE style of referencing.

Cooney, Darcy and Casey (2018) concurred with the point that Participant 15 made that integration of information from sources in academic writing is difficult for beginning university students. It is even more challenging for the students who pursue FOUN1014 because from the outset, they are informed that rather than using direct quotations, they should summarise and paraphrase information from sources that they would use in their documented essays. The University of Washington (2014) stated that, "Unlike other styles of writing, scientific writing rarely includes direct quotations . . . Quotations do not reflect original thinking" (para. 1). At a consultation session, Participant 18 said, "Miss, before I started studying at UWI, I was allowed to cite direct quotations in my oral and written assignments" (Researcher's logbook). Based on revelations made by some of my former FOUN1014 students, synthesising ideas for the writing of original

Table 4: Solicited tutor support during the writing of documented essay (N=32)

Descriptor	Percentage who sought help
Formulating the research question	66
Formulating the thesis	84
Developing the body paragraphs	47
Integrating information CSE style	87.5
Writing the conclusion	56
Compiling the list of references	86
Revising and editing	56
Grammar	81
Sentence construction	63
Analysis	84

expository compositions is a difficult transition they have to make when they start university; therefore they are usually desirous of teacher support.

Thus far, the participants have reported on their active participation or lack of it via WhatsApp networking. It is interesting to note that in their responses to Item 20 on the questionnaire, all of the participants – 24 (75%) strongly agreed and 8 (25%) – agreed that the read aloud intervention helped them with the writing and refining of their documented essays. Also, the fourteenth item on the questionnaire invited the participants to select from the areas of the documented essay for which they got help by reading aloud their research essay in progress to their tutor at consultation. The results are presented in Table 4 above.

For the most part, the percentages presented in Table 4 (tutor support) are greater than those in Table 3 (peer support). These numbers indicate that even if students have dialogue among themselves about the different aspects of their academic writing, their teachers are indispensable parts of their writing instruction.

Intersection of virtual student support and physical instructor support

Combined, the principles of the theories of constructivism and connectivity postulated by Dewey (1966), Vygotsky (1978) and Downes (2007), Goldie (2016) and Siemens (2005) are fundamental to the teaching of academic writing in the 21st century. For obvious reasons, including collaborating with peers and getting help, guidance and support from their teachers, it is important that modern-day

learners interact and connect with others including those who operate in the virtual and physical worlds. One observable similarity in the findings is that 87.5 % of the participants revealed that they solicited support for the use of the CSE documentation style from their peers via WhatsApp as well as from their tutor by engaging in face-to-face interactions. This finding demonstrates that not only was documentation a major concern for them, but also that having garnered support from their peers, they were not completely satisfied that they understood well enough to do it single-handedly.

Also, there were other findings which suggested that there were certain aspects of the documented essay for which the students thought they needed the teacher's physical presence and support, rather than what their peers could offer to them virtually. Some of these were formulating the research question, the narrowed topic, and the thesis statement as well as writing accurate grammar and doing critical analysis. Reflecting on engagement in the read aloud sessions, some participants wrote the following:

Participant 17:

> Reading aloud at consultations was helpful as I was able to hear my errors and correct my own essay. Knowing that my tutor was there to support, guide and offer me expert advice, made a big difference for me and the final draft of my documented essay.

Participant 25:

> Reading aloud gave me the courage to own up to my mistake as it forced me to own up to what I wrote.

From observation, whenever the students did self-correction of their writing, it was empowering. This is one reward of self-directed learning (Hammann 2005; Harris and Graham 2009; Santangelo, Harris, and Graham 2016). Being in the presence of the students when they capitalised on their "self-directed teachable moments" one could feel and see their confidence growing. However, it is important to note that the implementation of the read aloud intervention was mentally, physically and emotionally demanding for the tutor. For best results, this transactional strategy required careful planning and long hours of one-to-one teacher/student engagement. The tutor's expedience was paramount.

The findings indicate that by conveniently using their screen time via WhatsApp, most of the students engaged in purposeful self-initiated learning about the writing

of their documented essays. They assumed responsibility for their learning by seeking support from their peers, and whenever they needed clarifications, they consulted with their writing instructor. By networking with their peers in their virtual spaces, the students were able to ask their instructor questions that were directly related to concerns that emerged at different stages of the writing process. The students thoughtfully considered the peer and tutor feedback that they got (Hattie and Timperley 2007). Thus, active engagement in the writing process beyond the walls of the classroom, combined with the scaffolding the students got from their tutor when they read aloud the documented essay at different stages of its development, contributed to their successful pursuit of FOUN1014. All of the participants passed the documented essay with scores ranging from C- (50%) to A- (80%), and the course, C+ (56%) to A- (81%).

Implications of Students' Perceptions for Future Practice

The participants' perceptions of the combined use of WhatsApp and read aloud in FOUN1014 have implications for future practice. Although the majority engaged meaningfully with this modern technology while pursuing FOUN1014, this does not suggest that it is the "quick fix" for different challenges that science students encounter when writing for academic purposes as well as when practising other critical literacy skills such as reading. This is in keeping with the notion that there is no absolute learning strategy because there are multiple ways of attaining knowledge (Balrir 2013). Even with rapid and sophisticated advancements in technology, including WhatsApp that can be gainfully utilised in university teaching and learning processes, the wisdom that has guided traditional classroom practices, that students are unique and have individual learning styles and preferences, will not be easily erased (Gardner 1993).

The National Council of Teachers of English (NCTE) (2005) emphasised that during a digital era such as the 21st century, "There are increased cognitive demands on the audience to interpret the intertextuality of communication events that include combinations of print, speech, images, sounds, movement, music, and animation" (sect. 2). Assuming their complex roles as writers, university students who use WhatsApp are not only consumers of such communication events, but they are also producers of them, thus there is the need for them to be versatile. Lea and Street (2010) must have thought about such versatility when they wrote:

> From the student point of view, a dominant feature of academic literacy practices is the requirement to switch their writing styles and genres between one setting and another, to deploy a repertoire of literacy practices appropriate to each setting, and to handle the social meanings and identities that each evokes. (363)

Therefore, there is dire need for writing facilitators to engage university students' minds to excel in their physical and virtual worlds. Collier (2014) mentioned that, "The eight habits of mind identified as essential for success in college writing are curiosity, openness, engagement, creativity, persistence, responsibility, flexibility, and metacognition" (12). Actually, the participants demonstrated combinations of these characteristics when they read their compositions aloud at consultations, critically interrogated their writing and discovered their strengths and weaknesses and came up with plausible solutions to problematic areas. Thus, it is being proposed that writing instructors should not only support their students as they "write to learn" and "learn to write" (McLaren 2012) at the university level; they should also guide students as they "learn to read" and "read to learn", "think to learn" and "learn to think" among other academic literacy skills that they will need to apply when they navigate the contours of the modern writing classroom and virtual spaces (Beldarrain 2006; Bryant 2012; Collins and Halverson 2009). Indeed, applications such as WhatsApp, and constant exercise of habits of the mind (Collier 2014; Milson-Whyte 2015), interfaced with the theories of constructivism and connectivism, can help writing facilitators to satisfy the learning needs of the modern day university learner writers (Foroughi 2015).

Conclusion

The use of WhatsApp and read aloud as means of engaging students in self-initiated peer and tutor-supported learning has the potential of diversifying writing instruction for young student in this digital era. However, university writing students, like their counterparts at other levels of the educational ladder, have different preferences and learning styles and these should be considered for the best learner outcomes for innovative teaching and learning. If they take the time to read aloud their writing and engage in self-initiated learning as well as solicit peer and tutor support, they will be more aware of what they write and will be in strategic positions to monitor their own learning. The onus is on university writing tutors as well as their students to use the technological and human recourses that are at their disposal so they can develop as versatile writers.

Future Research

In this digital era, it is incumbent on writing instructors to integrate the use of modern technologies and more traditional pedagogical practices. A longitudinal study on how science students view the use of other social media applications alongside innovative tutor-guided strategies for the completion of assignments such as the poster creation and presentation and the reflective essay would add new dimensions to the future modification and delivery of FOUN1014.

APPENDICES

Appendix 1: Consent Letter and Form

THE UNIVERSITY OF THE WEST INDIES
MONA CAMPUS

CABLE AND TELEGRAPH
"UNIVERS"

KINGSTON 7, JAMAICA
Telephone: (876) 927-1660 to 9

FACULTY OF HUMANITIES & EDUCATION
Department of Language, Linguistics & Philosophy

Telephone: (876) 970-2950, 927-1641, 935-8952, 935-8953; 935-8954. Facsimile (876) 970-2949

January, 2018

Dear Student

As a follow up to our informal conversation, I wish to officially request your participation in a research project which will focus on "WhatsApp Networking and Read Aloud: Self-regulated Tutor Scaffolding for the Writing of the Documented Essay for Science Students at a Jamaican University"

I will observe you and write information relevant to the research when you consult with me weekly. You will also be required to complete a questionnaire at the end of the course. You will not be required to disclose your name. The information which you will provide will be used only for organizational and educational purposes and will be held in strict confidence. Please feel free to withdraw your participation from the study if you so desire.

I am kindly asking you to complete the attached consent form and return it to me as soon as possible
Thank you.

Carmeneta Jones PhD
Researcher

_____

I agree to participate in the research project.

Signature: _____

Date: _____

Consent Form

Introduction

As part of the invitation to participate in this research project, you are asked to consider following:

Purpose of the Study

Your perceptions of the use of WhatsApp Networking and Read Aloud: Self-regulated Tutor Scaffolding for the Writing of the Documented Essay for Science Students at a Jamaican University

Selection Criteria

You were selected because you are currently studying FOUN1014 and will be writing the documented essay.

Risks

The research-related activities in which you will participate will not expose you to any form of risk.

Benefits

The results of the study will offer insights which will contribute to university educators' understanding of how modern technologies can be used to diversify students' learning experiences as they write for academic purposes

The research will require only the time you will spend attending and conversing with your instructor at consultation and completing the questionnaire.

Permission for recording and publication

With your permission, I also plan write your contributions.

Contacts

You may call Carmeneta Jones at 876-935-8514/466-6680 if you need further clarification.

Your Signature

The signing of your signature indicates that you understand and agree with the terms concerning your participation the research.

_____

Participant's Name (Printed)

_____

Participant's Signature

Date signed: _____

Appendix 2

Questionnaire for WhatsApp networking and read aloud: Self-regulated tutor scaffolding for the writing of the documented essay for science students at a Jamaican University

Information obtained in this questionnaire will be used in published and unpublished reports on students' perceptions of the use of "WhatsApp Networking and Read Aloud as Self-regulated Tutor Scaffolding for the Writing of the Documented Essay for Critical Reading and Writing in Science and Technology and Medical Sciences" in Semester II, 2018. By completing this questionnaire, you are agreeing to the use of the data for this research project.

Instructions: Please type an X to the right side of the responses which apply to you, and write full sentences where necessary.

1. What is your gender?   a. Female   b. Male
2. What is your country of origin? _____
3. What is your age range? 17–20 years b. 21–25 years c. 26–30 years. d. 31 years and above
4. Which year of university studies are you? a. First Year? b. 2nd Year? c. Final Year?
5. What is your major/programme?_____
6. What was your initial response to the use of WhatsApp for networking about matters relating to your pursuit of FOUN1014?

   _____
   _____
   _____

7. How often did you participate in your class' WhatsApp group chats to get peer support when writing the documented essay?
   a. as often as necessary   **b.** daily   **c.** weekly   **d.** biweekly   **e.** never

8. I felt free to use my class' WhatsApp as a means of getting the support of my peers when I did the preparation for the writing of the first draft of my documented essay.
   a. Strongly agree **b.** Agree **c.** Undecided **d.** Disagree **e.** Strongly disagree

9. Explain your response to Item 8.

_____
_____
_____

10. I got useful insights when I used my class' WhatsApp group facility as a means of getting support from my peers when I was not certain about the conventions of academic writing while revising the drafts of my documented essay.
    a. Strongly agree **b**. Agree **c.** Undecided **d.** Disagree **e.** Strongly disagree

11. Explain your response to Item 10.

_____
_____
_____

12 The use of WhatsApp chats as means of getting a deeper understanding of concepts relating to the writing of the documented essay provided clarity for me.
    a. Strongly agree **b**. Agree **c.** Undecided **d.** Disagree **e.** Strongly disagree

13. Select from the following the areas of the writing of my documented essay for which you got help from networking with your peers in your class' WhatsApp group.

    a. Understanding the stimulus passages
    b. Formulating the research question
    c. Formulating the subsidiary questions
    d. Narrowing the topic
    e. Formulating the thesis
    f. Writing the attention grabber
    g. Writing the introduction
    h. Developing the body paragraphs.
    i. Integrating information from sources based on the CSE documentation style
    j. Writing the conclusion
    k. Compiling the list of references
    l. Revising and editing
    m. Grammar
    n. Sentence construction

    o.   Analysis
    p.   All of the above
    q.   None of the above
    r.   Others _____

14. Select from the following the areas of the writing of my documented essay for which you got help by reading your essay aloud at consultation.

    a.   Understanding the stimulus passages
    b.   Formulating the research question
    c.   Formulating the subsidiary questions
    d.   Narrowing the topic
    e.   Formulating the thesis
    f.   Writing the attention grabber
    g.   Writing the introduction
    h.   Developing the body paragraphs.
    i.   Integrating information from sources based on the CSE documentation style
    j.   Writing the conclusion
    k.   Compiling the list of references
    l.   Revising and editing
    m. Grammar
    n.   Sentence construction
    o.   Analysis
    p.   All of the above
    q.   None of the above
    r.   Others _____

15. Playing the role of advisor for my peers in WhatsApp chats about matters concerning the writing of the documented essay and the act of reading my documented essay aloud to my writing instructor at consultation and self-identifying and self-correcting my errors were sources of student empowerment for me.
    a. Strongly agree **b.** Agree **c.** Undecided **d.** Disagree **e.** Strongly disagree

16. My class representative used WhatsApp chats to mobilize students' knowledge as resources to help me with the writing of the documented essay.
    a. Strongly agree **b.** Agree **c.** Undecided **d.** Disagree **e.** Strongly disagree

17. The chats that I engaged in re the writing of my documented essay put me in a position to ask my instructor more specific and informed questions.
    a. Strongly agree **b**. Agree **c.** Undecided **d.** Disagree **e.** Strongly disagree

18. Overall, what were your perceptions of the use of your class' WhatsApp for networking about your preparation, drafting and revision of the documented essay?

    _____
    _____
    _____
    _____

19. In which other ways do you think future FOUN1014 students could benefit from the use of networking about the writing of the documented essay?

    _____
    _____
    _____

20. Overall, the processes in which my FOUN1014 peers engaged when we read aloud our documented essays at consultation and self-identifying and self-correcting errors were helpful.
    a. Strongly agree **b**. Agree **c.** Undecided **d.** Disagree **e.** Strongly disagree

21. What are some strong recommendations that you would make about students reading their documented aloud at consultation and self-identifying errors and self-correcting them?

    _____
    _____
    _____
    _____
    _____
    _____

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