STUDENTS' PERCEPTIONS OF ONLINE READING BEHAVIOUR AT AN INSTITUTION OF HIGHER LEARNING IN SOUTH AFRICA: A PILOT PROJECT

M. De Jongh*

http://orcid.org/0000-0002-1397-2023

C. Milton

https://orcid.org/0000-0001-9429-3200

*Department Speech-language Pathology and Audiology

Sefako Makgatho Health Sciences University

Pretoria, South Africa

ABSTRACT

Technological advances and the internet have altered the way people engage with reading material. Students' reading preferences are increasingly screen-based as most students prefer and are required to use online reading in higher education institutions. The research explored the perceived impact of online reading on students' reading comprehension and academic performance.

A non-experimental research design was utilised for this survey, typically including the *quantitative* domain and, to a lesser extent, the qualitative domain.

Seventy-one students who were available and consented completed the survey and included 20 first year, 19 second year, 22 third year and ten fourth year students.

The results from a pilot study conducted on first to final year students at a department from a Health Care Sciences University indicated mostly positive feedback regarding the perceived effect of online reading on reading comprehension and academic performance. Most students prefer online reading as it is easily accessible, visually interactive and provides unlimited access to information. The results showed correlations and contradictions to the findings presented in the literature.

Conclusions, recommendations and implications are made based on the findings of the study. The findings indicate that students, especially first-year entering students, should be prepared for online reading and be made aware of online reading techniques to support them in attaining academic literacy. These reading techniques could improve the throughput rate and lower the dropout rate in higher institutions in South Africa.

Keywords: online reading, offline reading, reading comprehension, academic performance

INTRODUCTION

Students' traditional reading culture and reading preferences have changed, and online- or

screen-based reading practices are increasingly becoming the norm. (Mangen, Walgermo, and Bronnick 2013; Azmuddin, Nor, and Hamat 2017). Online versions, also referred to as the hypertext format or hypertexts (Zarrabi 2015), accessed by devices such as laptops, tablets, and smartphones (Mangen et al. 2013) has undeniably altered the way students read and acquire knowledge (Mangen et al. 2013).

Hooper and Herath (2014) state that online reading (through media-rich content) could improve users' reading speed and capacity (the amount of information a reader can retain), improve flexibility and assist them in making sense of the text as they adapt and implement reading strategies.

Reading strategies that online users utilise relate to the amount of information they can extract from the text. Research has shown that skilled online readers read with purpose, preview the text, activate background knowledge, make connections between old and new information, ask questions, use strategies to clarify misunderstood text and monitor their understanding (Hermida 2009; Azmuddin et al. 2017).

Mangen et al. (2013) and Dockter (2016), however, indicate that online reading may also present disadvantages specifically for younger students and may impact short and long-term memory and concentration as hyperlinks are interconnected to a complex web-like structure (Zarrabi 2015). Additionally, the hypertext format used in online reading materials tends to increase cognitive demands on decision-making and visual processing and reduce reading comprehension (Mangen et al. 2013).

Hooper and Herath (2014) state that an "offline reader" use traditional hard copy formats and read slower, allowing more in-depth reading and optimising reading ability and comprehension compared to online reading. They conclude that a surface approach is typically employed when reading online academic resources, affecting comprehension, concentration, content absorption, and content recall, consequently influencing students' academic performance.

Bowen et al. (2014) indicated a lack of in-depth studies on the challenges associated with online reading and its impact on students' comprehension and academic performance. This finding is even more pertinent in the South African higher education context, where students from a historically disadvantaged educational context are typically ill-prepared for the general demands of higher education (Bharuthram 2012).

LITERATURE REVIEW

Reading, one of the oldest traditions of human civilisation, has been the passion of the greatest scholars of all times (Zarrabi 2015) due to its access to new information (Loan 2012; Paris and

Hamilon 2014). Reading and comprehending what is read is critical in a student's academic success (Ouyang et al. 2020). Reading comprehension, a multi-dimensional process (Lee 2014), allows students to make inferences about what they extract from the text and lead to better academic performance (Ouyang et al. 2020). Typically, newly read information is integrated with what is already known about a particular topic (Margolin et al. 2013; Mascolo and Castillo 2015), and new ideas are discovered, allowing students to take advantage of their world knowledge.

Readers apply either a surface or deep reading approach (Hermida 2009; Paris and Hamilton 2014; Zarrabi 2015; Dolmans et al. 2016). A surface approach utilises skimming and scanning techniques (Fatmawati 2014; Azmuddin et al. 2017), which do not allow the reader to extract meaning from the whole text (Fatmawati 2014). Students utilising a surface approach to reading may not purposefully engage with the facts and consider the text's information as isolated (Hermida 2009; Cano García et al. 2014).

In contrast, the deep approach to reading engages the student with a purpose to comprehend and connect with prior knowledge (Dolmans et al. 2016). This approach consists of three stages: text-marking, note-making and rewriting (Tompkins 2014; Rose 2017). *Text-marking* allows the reader to identify essential information, interpret and highlight what they have read by paraphrasing or using synonyms (Tompkins 2014; Zarrabi 2015; Azmuddin et al. 2017). *Note making* then enables the reader to use the highlighted words and extract key information (Tompkins 2011; Zarrabi 2015; Azmuddin et al. 2017), whilst *rewriting* permits the reader to identify patterns and critical elements (Tompkins 2014). These stages allow the reader to actively engage in learning by connecting and restructuring the text, enhancing comprehension as connections are made to already known concepts, and using this to solve problems in new contexts (Dolmans et al. 2016). Simply put, while surface readers focus on the text itself, deep readers focus on the meaning of the text (Marton and Bowden 1998; Dolmans et al. 2016).

The traditional or offline approach to reading typically applies higher-order or meta-cognitive strategies such as analysing, synthesising, solving problems, and reason (Hooper and Herath 2014) to form new meaning from the text (Azmuddin et al. 2017). According to Hooper and Herath (2014), with this approach students may apply reading skills such as *self-talk* (utilising the "inner voice" to monitor, criticise, and comment on what is read). They may also use *self-explanation* (explaining how new information is related to known information or explaining steps taken during problem-solving). In addition, *whole and part learning* (reading through the text once or twice and then extracting the more difficult sections for further reading and investigation) could also be applied. In a study by Hooper and Herath (2014), students

explained that they experience higher comprehension levels, concentration, content absorption and content recall when applying these skills during offline reading.

Online readers, on the other hand, frequently use surface reading (Loan 2012). Online reading is non-linear, non-sequential and interactive since the reader is free to cross-reference between related sections in the text. Thus, online readers might engage with the text on a more superficial level (Azmuddin et al. 2017).

Jones and Brow (2011) and Azmuddin et al. (2017) indicate that university students prefer online reading as they can access a vast collection of reading material in a shorter time as more choices such as font and font size, viewing and scrolling are available compared to physical page-turning (Siegenthaler et al. 2011). These choices may, however, lead to superficial reading and reduce focused and in-depth reading (Loan 2012; Mangen et al. 2013; Dolmans et al. 2016).

Nevertheless, students prefer and predominantly demonstrate satisfaction with online reading (Azmuddin et al. 2017). Online reading allows added access to information through hyperlinks (Mangen et al. 2013; Azmuddin et al. 2017); it is more engaging and exciting and includes features such as pop-up definitions, pronunciation of words, automatic page-turning, and the option of read-aloud narration (Jones and Brown 2011). Online platforms also assist students in reading faster (Hooper and Herath 2014; Azmuddin et al. 2017) even though it may lead to superficial reading, losing focus and poor long-term retention, consequently impacting comprehension and learning (Loan 2012; Hermida 2009; Mascolo and Castillo 2015).

The former arguments highlight the disparities as well as the advantages and disadvantages between online and offline reading. Table 1 provides a summary of these disparities.

Table 1: Differences between offline and online reading

Traditional/offline reading	Online reading
Hard copy printed text format	Hypertext format on electronic devices
"Bottom-u" view of reading: Readers use a slower reading pace resulting in increased comprehension	Readers tend to read faster as the speed of reading increases over time but may result in decreased comprehension
Linear and text bound	Non-linear (non-sequential) and interactive (cross-referencing between related sections of the text)
Deep approach to reading incorporates higher-order cognitive strategies such as problem-solving and reasoning to obtain new meaning and improved comprehension	Surface approach includes the use of skimming and scanning and may negatively influence comprehension
"Deep reader" focus on the meaning of the text	"Surface reader" focus on the text itself
Offline materials not always readily available	Online reading materials are easier to access and offer more choices
Most students experience higher comprehension levels, concentration, content absorption, content recall and relaxation when reading offline.	Readers (including students) engage with the text on a more superficial level, that may affect reading comprehension.

Compiled from Hermida (2009), Mangen et al. (2013), Mascolo and Castillo (2015), and Dolmans et al. (2016)

In summary, traditional reading allows the reader to engage with the text, typically extracting meaning from the text. In contrast, online reading may lead to superficial reading as readers mostly use skimming and scanning to connect with the text.

Reading with understanding is essential for academic achievement (Margolin et al. 2013; Mascolo and Castillo 2015). Success at the university level depends on existing premorbid literacy, cognitive skills acquired in high school, reading and writing, and critical thinking to read critically. Critical reading increases comprehension of the various ideas presented in the text (Hermida 2009; Mascolo and Castillo 2015).

However, Mascolo and Castillo (2015) found that high school learners are not adequately equipped for reading once they enter tertiary settings, which may be related to the fact that reading activities at university differ from high school reading activities (Hermida 2009).

Similarly, first time entering students at institutions of higher learning in South Africa face numerous challenges due to under-preparedness for online reading and learning (Clarence and Bharuthram 2015). Bharuthram (2012) indicated that as far back as 2006, he investigated the development of reading strategies of first-year students registered for the Dental Technology programme at the Durban University of Technology. The findings showed that many students who enter higher education, in a developing context, lack the required academic literacy skills and knowledge needed to engage in a meaningful way with academic text (Bharuthram 2012).

A similar study by Van Rensburg, Coetzee, and Schmulian (2014) investigated undergraduate students majoring in accounting in South Africa's reading comprehension. They found that only two-thirds of the students could cope with information gained from online reading materials. Bharuthram (2012), suggests that this can be ascribed to the difference between the level, amount and complexity of reading required in higher education compared to high school. Students are also required to construct and reconstruct ideas primarily presented in English, which is not their first language, to gain a complete understanding of the text by analysing, synthesising, and evaluating the presented information (Hermida 2009; Azmuddin et al. 2017). As a result, students who are not English first language speakers and lack these skills when they enter higher education may have difficulty acquiring knowledge to succeed academically (Bharuthram 2012).

Baker et al. (2019) indicated a shortage of literature concerning online reading practices in higher education, the difficulties that students encounter when engaging with text, and students' understanding and experiences concerning reading practices. This finding is even more valid for traditionally under-represented student groups noticeable in the South African context.

In South Africa, most entering first-year students are ill-prepared for academic literacy

and online reading and struggle to read academic material in English (Zarrabi 2015). This inadequate preparation may be due to numerous multi-layered factors (Mascolo and Castillo 2015), which include insignificant educational preparation because of an underperforming school system and linguistic or cultural differences, including limited English proficiency. These factors are specific to the South African context. These factors may lead to an increase in the dropout rate of students (Spaull 2013). Furthermore, Mascolo and Castillo (2015) note that English proficiency in higher education settings has dropped globally by 10 per cent over the last ten years.

As students prefer online reading as a platform for learning and acquiring information (Ouyang et al. 2020), it is important to examine how students perceive online texts and the impact that it might have on their reading comprehension (Myrberg and Wiberg 2015). Myrberg and Wiberg state that it is also essential to determine the sources that may distract and hamper students to acquire knowledge from online platforms and consequently affect academic abilities. They suggest that one way of supporting students to manage discipline-specific academic reading material is to prepare and develop students' awareness concerning online reading challenges and then implement online reading support strategies within the curriculum (Myrberg and Wiberg 2015; Ouyang et al. 2020). With a shortage of research in the South African context, the researchers determined how students at a specific department at an institution of higher learning perceived the impact of online reading behaviour on their reading and related abilities. This research will impact the reading strategies that can be implemented to support students.

This research addressed an under-researched area (Hooper and Herath 2014), specifically for the South African context. It explored students' perceptions of the impact of their online reading behaviour on their comprehension and academic performance in a specific department at a South African higher learning institution.

METHODOLOGY

Research design

The non-experimental survey design used provided structured data and offered a brief, pre-planned set of questions to obtain specific information about students' perceptions of online reading and the perceived impact it has on students' comprehension and academic performance.

Participants

Convenience sampling was used. All registered undergraduate students (n=113) from a

department in the School of Health Care Sciences at an institution of higher learning were contacted to participate in the study. Students at this institution are mostly from previously disadvantaged contexts.

Seventy-one students who were available and willing to participate completed the survey. Twenty participants were in their first year, 19 in the second year, 22 in the third year and ten in the fourth year.

The demographics of the participants, including age, gender and home language, are presented in Table 2.

Table 2: Demographic information of students participating in the study

		Levels of Study				
		First year (n=20)	Second year (n=19)	Third year (n=22)	Fourth year (n=10)	All year groups (n=71)
Age of Participants	17–22	100%	94.7%	81.8%	20%	81.7%
	23–28	0%	5.3%	18.2%	80%	18.3%
Gender	Male	55%	26.3%	31.8%	50%	39.4%
	Female	45%	73.7%	68.2%	50%	60.6%
Home Language	English	0%	0%	0%	10%	1.4%
	IsiNdebele	5%	0%	4.5%	0%	2.8%
	SiSwati	0%	5.3%	9.1%	0%	4.2%
	IsiXhosa	5%	5.3%	4.5%	0%	4.2%
	IsiZulu	10%	0%	13.6%	0%	7%
	Sepedi	45%	21.1%	27.3%	40%	32.4%
	Setswana	15%	15.8%	13.6%	20%	15.5%
	Sesotho	5%	0%	0%	0%	1.4%
	Tshivenda	10%	42.1%	9.1%	10%	18.3%
	Xitsonga	5%	10.5%	18.2%	20%	12.7%

The demographic data shows that most participants are female (60.6%), their ages range between 18 and 28 years, with 81.7 per cent of the participants between 17 and 22 years of age and only 1.4 per cent of students using English as their home language.

The distribution of the participants' educational information is presented in Table 3 below.

Table 3: Educational information of the participants

Year levels	Years at university		Year/s repeated? (Yes/No)		If yes, which year?			
	1–4	5–8	Yes	No	First year	Second year	Third year	Fourth year
First year	100%	0%	0%	100%	0%	0%	0%	0%
Second year	68.4%	31.6%	21.1%	78.9%	80%	20%	0%	0%
Third year	72.7%	27.3%	54.5%	45.5%	30%	50%	20%	0%
Fourth year	40%	60%	60%	40%	16.7%	0%	83.3%	0%

The majority (80%) of the participants in their second year repeated their first year, whereas

83.3 per cent of the fourth year students repeated their third year. Bloom's Taxonomy, a classification system, defines and distinguishes between the different levels of human cognition, i.e., thinking, learning, and understanding. This classification indicates that first-year students mostly demonstrate and recall previously learned material, i.e., facts, terminology, simple concepts, and answers. Students at the third-year level are expected to solve problems by applying acquired knowledge, facts, techniques and rules (Wilson 2016). Third-year level students must have appropriate knowledge and skills to access different online resources and independently retrieve, process, and critically evaluate information (Munzenmaier and Rubin 2013) and apply this knowledge in practice (Conklin et al. 2005). Even though the two year groups skills are very different, both groups of students must have the required skills of accessing online resources and making sense of what they read, as reading and reading comprehension are critical components in a student's learning (Ouyang et al. 2020).

Some students across the second to the fourth year indicated that they repeated their first year, partly due to the university's increased workload. Furthermore, high school learners (specifically those from semi-rural and rural areas) traditionally receive hard copy reading material. Once they enter university, they might not be skilled to access online reading material independently, use online reading for academic purposes and engage in a large number of self-study activities to understand the information (Azmuddin et al. 2017). Just over 98,6 per cent of the participants in this specific study are also not English home-language speakers, while online reading resources for academic purposes are primarily provided in English at South African universities. Therefore, these students may struggle to read and comprehend academic resources in English and may not be adequately prepared for online reading once they enter university (Zarrabi 2015; Ouyang et al. 2020).

Ethical clearance was obtained from the University Research and Ethics Committee (SMUREC/H/85/2016:UG). Participants were informed of the purpose of the research and that they could withdraw at any given time. They also provided written consent and were ensured anonymity

Data collection

Using guidelines from studies by Hooper and Herath (2014) and Hermida (2009), a self-constructed questionnaire determined participants' feelings, beliefs, experiences, perceptions, and attitudes concerning online reading. The questionnaire collected quantitative, and to a lesser extent, qualitative data consisting of mainly closed- and a few open-ended questions. The qualitative component was included to validate the quantitative data and improve the overall strength of the study.

The questionnaire consisted of four sections that aligned with the aim and objectives of the study.

A pilot study was conducted to identify potential problems that may affect the results' quality and validity. The necessary adjustments were made to the questionnaire after receiving feedback from the pilot study participants. These participants completed a one-page questionnaire to identify potential problems.

Data analysis

Data obtained from the completed questionnaires for the main study was captured on excel spreadsheets. Quantitative data was analysed using descriptive statistics and presented as percentages and frequency distributions. After that quantitative and qualitative results were integrated and compared (Guetterman, Fetters, and Creswell 2015).

The qualitative data was quantified and similar responses categorised and presented in tables. The researchers compared the categories to find patterns and similarities between the responses using inductive analysis and linked to the quantitative data.

Reliability and validity

The research was valid and reliable as the questions assessed the construct in question, i.e., reading behaviour. The concepts were clearly stated to avoid confusion and warrant content validity. Transparency on questions was provided during data collection, and a pilot study was implemented. An experienced researcher provided feedback on the content and clarity of the questionnaires to address face validity. The findings of this study were compared to earlier studies to validate the results. Reliability was established by comparing item scores. Though there was some variation between item scores, the item scores did not contradict each other.

Bias

Only correctly completed questionnaires were utilised for data analysis purposes. Furthermore, the questionnaire did not include any leading questions. The results were interpreted according to the study's aim and objectives.

RESULTS AND DISCUSSION

The findings and the discussion thereof according to the aim and objectives of the study are presented in Figure 1.
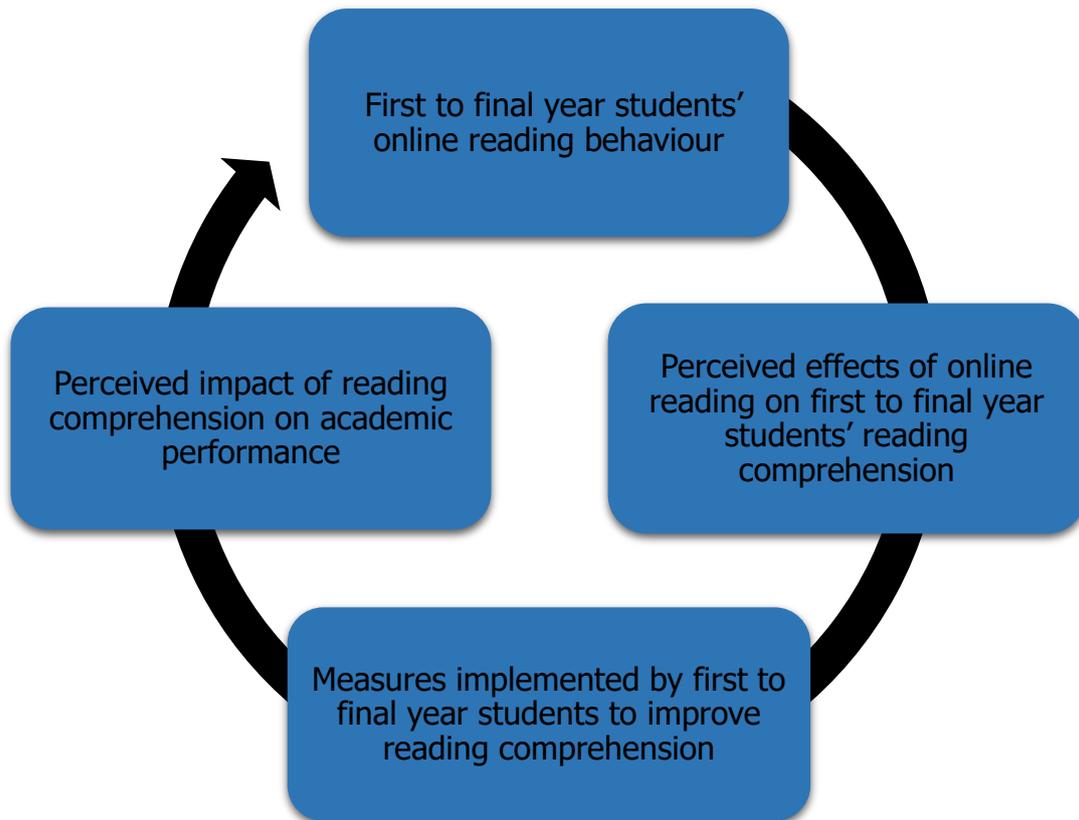
Figure 1: Underlying objectives of the study

The *quantitative* findings will be presented first, and after that, the *qualitative* results.

Students online reading behaviour

Quantitative domain: Participants had to choose a statement that best described their reading behaviour. A summary of their reading behaviour and the online reading techniques used to improve reading comprehension are presented in Table 4.

Table 4: Participant's reading behaviour

Online reading behaviour	Response/s	Levels of study				
		First year (n=20)	Second year (n=19)	Third year (n=22)	Fourth year (n=10)	All levels of study (n=71)
"Do you read online"?	Yes	100%	94.7%	95.5%	90%	95.8%
	No	0%	5.3%	4.5%	10%	4.2%
"Why do you read online"?	Enjoyment	0%	15.8%	4.5%	0%	5.6%
	Academic purposes	5%	15.8%	22.7%	10%	14.1%
	Both	95%	68.4%	72.7%	90%	80.3%
"Which online reading techniques do you use"?	Skimming	20%	26.3%	18.2%	30%	22.5%
	Scanning	30%	52.6%	40.9%	20%	38%
	Detailed reading	10%	0%	18.2%	10%	9.9%
	All of the above	40%	21.1%	22.7%	40%	29.6%

Online reading behaviour	Response/s	Levels of study				
		First year (n=20)	Second year (n=19)	Third year (n=22)	Fourth year (n=10)	All levels of study (n=71)
"Indicate if you read discipline specific materials such as journal articles"	Speech Language Pathology only	5%	21.1%	0%	0%	7.0%
	Audiology only	5%	0%	4.5%	0%	2.8%
	Both	90%	78.9%	95.5%	100%	90.1%
"Indicate if you read the following online i.e., news-papers; books etc"	Never	20%	42.1%	31.8%	40%	32.4%
	Rarely	35%	15.8%	27.3%	20%	25.4%
	Sometimes	35%	21.1%	13.6%	20%	22.5%
	Often	5%	15.8%	22.7%	0%	12.7%
	Very often	5%	5.3%	4.5%	20%	7%

The reasons for participants preferences for online reading are reflected in Table 4. According to Munzenmaier and Rubin (2013), the internet offers various choices for a similar topic, enabling students to explore the given choices and then selecting the preferred choice to acquire new information and knowledge for academic purposes and enjoyment. Allowing students to choose what they want to read also motivates students to learn (Goodwin 2010; Dolmans et al. 2016) and consequently improve academic performance.

The majority (90.1%) of participants indicated that they mostly read discipline-specific materials online (e.g., articles). These students also indicated that they dislike reading books or the news online they "do not have enough time" to go through all the information as they cannot apply a surface approach.

Thirty-eight per cent of the participants reported using surface online reading approaches, including scanning and skimming (22.5%). Whilst scanning helps in quickly searching for specific information in the text (Fatmawati 2014; Azmuddin et al. 2017), it does not allow the reader to extract the text's complete meaning (Fatmawati 2014). In contrast, only 9.9 per cent of the participants use detailed reading techniques online. This technique is time-consuming and requires more active engagement than scanning. The results reflect that fewer students make use of detailed reading, which may adversely influence comprehension.

Qualitative domain: The qualitative results confirmed the quantitative results as most participants (71%) reported that they prefer online reading, as resources are easily accessible. Accessibility includes navigating and interacting with the source (Nurhasanah, Agustiani, and Ulya 2020; Dockter 2016). Additionally, 40 per cent indicated that they could access an unlimited amount of information through "surfing" or navigating (List and Alexander 2017; Dockter 2016). According to Almendros Gutiérrez (2014), online reading favours visual learners as visual input, including videos, diagrams and pictures, improve comprehension and learning by up to 40 per cent. Almendros Gutiérrez (2014) also stated that the use of words and visual input supports students' organisation and communication of ideas and positively influences academic performance.

However, some students might find it difficult to study online as 14 per cent of the participants reported that online reading is visually straining. This feedback aligns with reports of The American Optometric Association [AOA] which states that the increased use of online reading has amplified the number of complaints related to vision (Klamm and Tarnow 2015). The AOA furthermore indicated that online reading might lead to discomfort, straining of eyes, headaches, unclear vision as well as neck and shoulder pain, described as "Computer Vision Syndrome" (Klamm and Tarnow 2015). Fatmawati (2014) explains that this might be due to ultraviolet, infrared and radio frequency emissions, which might damage the eyes and lead to students losing interest in online reading, resulting in comprehension difficulties.

The results for this objective shows that the participants mostly prefer reading discipline-specific material online as it is easily accessible, visually interactive and provides an infinite variety of online resources (Almendros Gutiérrez 2014). However, online reading may be visually straining, restricting students from extracting in-depth information, possibly affecting reading comprehension.

The perceived effect of online reading on students' reading comprehension

This section's *quantitative findings* shows that students' perceive online reading as impacting their tas comprehension positively.

The participants rated the perceived effect of online reading on reading comprehension by indicating how long it takes them to comprehend what they have read online compared to offline by selecting an answer, i.e. *"slower, same as reading offline or faster"*. They also had to indicate if they experience fatigue and get distracted when reading online by indicating either "*Yes*" or "*No*" and specify their understanding of the information presented online by indicating "*nothing, limited, almost everything or everything*". Finally, they had to select a word/phrase that best described how they recall information, i.e. "*very slow, slow, fast, very fast*". In addition to this the impact of the application of specific metacognitive reading, strategies on reading comprehension were also investigated. A summary of the responses is presented in Table 5 and Table 6.

Table 5: Effect of online reading on reading comprehension

Perceived effect on reading comprehension	Response/s	Levels of study				
		First year (n=20)	Second year (n=19)	Third year (n=22)	Fourth year (n=10)	All year levels (n=71)
Duration when reading online: " *How long does it take for you to understand what you have read"*	Longer	30%	15.8%	36.4%	40%	29.6%
	Same as reading offline	30%	15.8%	31.8%	10%	23.9%
	Faster	40%	68.4%	31.8%	50%	46.5%

Perceived effect on reading comprehension	Response/s	Levels of study				
		First year (n=20)	Second year (n=19)	Third year (n=22)	Fourth year (n=10)	All year levels (n=71)
Online fatigue	Yes	30%	42.1%	48%	60%	43.7%
	No	70%	57.9%	50%	40%	56.3%
Online distractions: "Do online distractions i.e., games, chatting etc. affect your understanding?"	Yes	75%	73.7%	90.9%	60%	77.5%
	No	25%	26.3%	9.1%	40%	22.5%
"How much of the information are you able to understand when reading online?"	Nothing	0%	0%	0%	0%	0%
	Limited	15%	15.8%	18.2%	30%	18.3%
	Almost everything	70%	73.7%	59.1%	50%	64.8%
	Everything	15%	10.5%	22.7%	20%	16.9%
"How fast can you recall information when reading online?"	Very slow	5%	5.3%	4.5%	0%	4.2%
	Slow	15.%	15.8%	27.3%	60%	25.4%
	Fast	45%	52.6%	40.9%	30%	43.7%
	Very fast	35%	26.3%	27.3%	10%	26.8%

The study's findings agree with those of Nurhasanah et al. (2020), as 46.5 per cent of participants in the current study perceive online reading as a measure that facilitates reading comprehension.

Only third-year participants (36.4%) indicated that it takes them longer to understand online reading than traditional reading material, and this correlates with the findings of Hooper and Herath (2014). These researchers suggest that online reading may negatively affect the reader's comprehension, cognition, and recall rates.

The majority (56.3%) also indicated that they easily get distracted even though they do not experience fatigue (74.6%). Fourth-year students, however, get less distracted (60%) compared with other year groups. These students might be more experienced, focused and better at coping with online distractions. According to Munzenmaier and Rubin (2013), at a fourth-year level, students can typically summarise online information even if distractions are present.

Most participants (64.8%) indicated that they understood almost everything they read online, and 43.7 per cent of participants indicated that they recall information faster when reading online. Zarrabi (2015) affirms that visually interactive online material increases the recall of information when presented in a suitable format. Improved recall consequently enhance decoding and improved comprehension of more significant amounts of information even though online reading is physically and mentally more demanding than traditional reading (Jabr 2013).

Table 6: Application of metacognitive reading strategies to improve reading comprehension

Online reading strategies: "Do you"	Response/s	Levels of study				
		First year (n=20)	Second year (n=19)	Third year (n=22)	Fourth year (n=10)	All levels of study (n=71)
"Ask questions such as why?"	Yes	60%	68.4%	72.7%	80%	69%
	No	15%	15.8%	9.1%	0%	11.3%
	Uncertain	25%	15.8%	18.2%	20%	19.7%
"Seek additional information?"	Yes	80%	57.9%	90.9%	70%	76.1%
	No	5%	26.3%	4.5%	10%	11.3%
	Uncertain	15%	15.8%	4.5%	20%	12.7%
"Expand your background knowledge?"	Yes	60%	31.6%	45.5%	70%	49.3%
	No	20%	15.8%	13.6%	0%	14.1%
	Uncertain	20%	52.6%	40.9%	30%	36.6%
"Examine the way you think?"	Yes	60%	57.9%	68.2%	70%	63.4%
	No	5%	15.8%	13.6%	10%	11.3%
	Uncertain	35%	26.3%	18.2%	20%	25.4%
"Make conclusions on opinions or beliefs?"	Yes	40%	26.3%	54.5%	40%	40.8%
	No	25%	31.6%	31.8%	20%	28.2%
	Uncertain	35%	42.1%	13.6%	40%	31%
"Identify ways to adjust the way you think?"	Yes	70%	47.4%	45.5%	80%	57.7%
	No	10%	26.3%	18.2%	0%	15.5%
	Uncertain	20%	26.3%	36.4%	20%	26.8%
"Do you think online reading has an impact on understanding?"	Yes	80%	47.4%	54.5%	80%	63.4%
	No	20%	52.6%	45.5%	20%	36.6%

Various metacognitive reading strategies that may be used used to improve reading comprehension are presented in Table 6. Students perceived online reading to have a positive impact on understanding (63.4%), and students used metacognitive reading strategies to improve their reading comprehension strategies. Metacognitive reading strategies employed included 69 per cent of students asking questions such as why, 76.1 per cent of students seek additional information, whilst 63.4 per cent examine the way they think whilst reading online. Research shows that applying metacognitive strategies could impact students' reading comprehension and academic performance as it helps readers construct meaning from the text (Zarrabi 2015; Azmuddin et al. 2017). This assistance affirms that improved reading comprehension is associated with the use of problem-solving strategies, such as activating background knowledge, summarising text, and generating questions to understand the text (Azmuddin et al. 2017).

The response categories to the open-ended question (*qualitative domain*) "*Do you think online reading has an impact on your reading comprehension?*" likewise assessed the perceived effect that online reading has on comprehension. The majority of the participants did

not attempt to answer the question, while other participants mostly provided vague answers. The probable reason was that it might be easier to choose an answer than merely providing their own opinions. Participants might have been uncertain or demonstrated a lack of knowledge. These answers were therefore not considered by the researchers. However, only 18 per cent of the participants stated that they could not make notes when reading online. This constraint may affect linear reading patterns (Hooper and Herath 2014; Mascolo and Castillo 2015) and supports the findings of Loan (2012), Azmuddin et al. (2017) and Dolmans et al. (2016), who emphasised that online reading may lead to a superficial reading of the text.

This findings for this objective indicate that students mostly perceive online reading as helpful, enhancing understanding and recall of information, opposed to traditional reading. Students are also motivated to use strategies to construct meaning amidst online distractions.

Measures for the advancement of reading comprehension

Quantitative domain: The participants had to indicate if they made use of additional measures while reading online. These definitions are summarised in Table 7.

Table 7: Additional measures to improve online reading

Measures	Definitions
Self-Talk	Utilising the inner voice to monitor, criticise, and comment on what is read
Self-Explanation	Explaining how new information relates to known information or explaining the steps taken during problem-solving
Whole and Part Learning	Reading through the text and then separating the more difficult sections for re-reading
Reciting	Clarifying information by saying it out loud
Elaborative Interrogation	Providing a reason why an explicitly stated fact or concept is true
Summarising	Writing summaries on the information presented
Imagery for Text	Forming mental pictures of the text
Re-reading	Reviewing the text material after the initial reading of the text
Practice testing	Self-testing the material by asking questions
See-say-do	Looking at the information, saying it out loud and incorporating movement to facilitate comprehension

Compiled from Dunlosky et al. (2013)

Implementing measures such as summarising and "chunking" the online information into smaller parts will add meaning to the text and assist readers should a "breakdown" in comprehension occur (Dunlosky et al. 2013; Zarrabi 2015; Azmuddin et al. 2017). A summary of the *quantitative findings* i. e. the additional measures used by the participants to improve reading comprehension, are presented in Table 8.

Table 8: Application of additional measures to improve reading comprehension

"When reading online: Do you apply the following measure"?	Response/s	Levels of study				
		First year (n=20)	Second year (n=19)	Third year (n=22)	Fourth year (n=10)	All levels of study (n=71)
Self-talk	Yes	60.0%	47.4%	54.5%	70.0%	56.3%
	No	15.0%	10.5%	27.3%	10.0%	16.9%
	Uncertain	25.0%	42.1%	18.2%	20.0%	26.8%
Self-explanation	Yes	80.0%	63.2%	59.1%	70.0%	67.6%
	No	15.0%	5.3%	9.1%	10.0%	9.9%
	Uncertain	5.0%	31.6%	31.8%	20.0%	22.5%
Whole and part learning	Yes	55.0%	52.6%	50.0%	50.0%	52.1%
	No	30.0%	31.6%	27.3%	20.0%	28.2%
	Uncertain	15.0%	15.8%	22.7%	30.0%	19.7%
Reciting	Yes	85.0%	57.9%	86.4%	80.0%	77.5%
	No	5.0%	31.6%	9.1%	0.0%	12.7%
	Uncertain	10.0%	10.5%	4.5%	20.0%	9.9%
Elaborative interrogation	Yes	55.0%	26.3%	63.6%	70.0%	52.1%
	No	20.0%	26.3%	22.7%	0.0%	19.7%
	Uncertain	25.0%	47.4%	13.6%	30.0%	28.2%
Summarising	Yes	65.0%	73.7%	90.9%	90.0%	78.9%
	No	30.0%	15.8%	9.1%	10.0%	16.9%
	Uncertain	5.0%	10.5%	0.0%	0.0%	4.2%
Imaginary text	Yes	60.0%	78.9%	81.8%	90.0%	76.1%
	No	10.0%	10.5%	9.1%	0.0%	8.5%
	Uncertain	30.0%	10.5%	9.1%	10.0%	15.5%
Re-reading	Yes	70.0%	78.9%	63.6%	100.0%	74.6%
	No	10.0%	5.3%	18.2%	0.0%	9.9%
	Uncertain	20.0%	15.8%	18.2%	0.0%	15.5%
Practice testing	Yes	50.0%	52.6%	54.5%	70.0%	54.9%
	No	5.0%	15.8%	22.7%	10.0%	14.1%
	Uncertain	45.0%	31.6%	22.7%	20.0%	31.0%
"See say do"	Yes	40.0%	68.4%	54.5%	80.0%	57.7%
	No	15.0%	15.8%	18.2%	10.0%	15.5%
	Uncertain	45.0%	15.8%	27.3%	10.0%	26.8%

The findings indicate that the participants applied some of these measures. The majority of participants (78.9%) reported that they summarise information. Summarising text reduces the cognitive load and assists with the recall of information (Hooper and Herath 2014; Zarrabi 2015).

Furthermore, 74.6 per cent of all the participants, including 100 per cent of the fourth-year participants, indicated that they apply the re-reading strategy. Students re-read to clarify information and increase comprehension (Kelley and Clausen-Grace 2007; Azmuddin et al. 2017). These measures are utilised mainly by senior students to apply knowledge in practice (Munzenmaier and Rubin 2013).

Additionally, the participants indicated that they use imaginary text (76.1%), reciting

(77.5%) and self-explanation (67.6%). According to Dunlosky et al. (2013), all these techniques reduce the mental load, consequently improving reading comprehension and academic performance.

Perceived impact of reading comprehension on students' academic performance

Qualitative data obtained from one open-ended question concerning the perceived impact of reading comprehension on academic performance indicates that only 23.9 per cent of the participants who answered the question view online reading material as assisting them in performing better academically. This finding correlates with the findings of Margolin et al. (2013), which state that reading with understanding is essential for learning. Palani (2012) affirms that online reading enhances the understanding of words in isolation and in text, and as a result, assists the reader academically.

The findings obtained for this objective indicate that only a few students perceive adequate reading comprehension skills as essential components for academic success. Researchers such as Margolin et al. (2013) and Ouyang et al. (2020) stated that reading with understanding is fundamental for effective learning and academic performance.

A summary of participants perceptions of the impact of online reading behaviour on comprehension and academic performance are presented in Table 9.

Table 9: Summary of participants' perceptions

Objectives pertaining to:	Positive perception of online reading	Negative perceptions of online reading
Online reading behaviour Quantitative	✓ Provides access to a variety of online resources, particularly discipline-specific material ✓ Allows for the use of different online reading techniques	✓ Reading news updates online are not pleasurable and are time-consuming
Online reading behaviour Qualitative	✓ Easily accessible ✓ Provides unlimited access to information ✓ Visually interactive	✓ Visually straining ✓ May provide irrelevant information when searching for discipline-specific information
Perceived effect of online reading on reading comprehension Quantitative	✓ Increases understanding of content ✓ Less fatigued ✓ Faster recall of information ✓ Application of online reading strategies improves reading comprehension	✓ Takes longer to understand ✓ Easily distracted/many distractions
Perceived effect of online reading on reading comprehension Qualitative	✓ Visually interactive ✓ Online reading techniques such as skimming and scanning can improve comprehension	✓ Inability to take down notes
Measures used to improve reading comprehension Quantitative	✓ Additional measures improve reading comprehension	✓ No negative responses indicated
Perceived impact of reading comprehension on academic performance Qualitative	✓ Improved understanding positively impacts academic performance ✓ Improved recall of information impacts on academic performance	✓ Reading comprehension may not affect academic performance

Online reading is mainly perceived as positive. Participants primarily indicated that it enhances comprehension, recall of information, getting the main idea and consequently augments academic performance. However, some negative perceptions were also conveyed. A few participants indicated that online reading prevents students from taking down notes and can be visually straining and distracting. Though there were some negative perceptions, online reading is mainly perceived as positive by the participants.

SUMMARY OF THE FINDINGS

This study addressed an under-researched topic (Hooper and Herath 2014), specifically for the South African context, vis-à-vis the students' online reading behaviour, the perceived effect on reading comprehension and academic performance.

This study's findings indicate that most students prefer to read online and perceive online reading as interactive and accessible. They also indicated that their understanding of reading content increase when reading online, even though it takes them longer to understand the information. This finding correlates with the findings of Hooper and Herath (2014).

Interestingly, some students presented contradictory views as they perceived online reading comprehension not to impact their academic performance even though researchers such as Margolin et al. (2013) and Ouyang et al. (2020) state that academic success is dependent on the ability to understand what is read. Additional feedback indicated that online reading is visually straining and may be distractive. Unrestricted access to information (Dolmans et al. 2016) may provide incongruent information and influence reading culture, reading comprehension and academic performance (Kojo, Agyekum, and Arthur 2018).

However, institutions of higher learning may assume that students can read and comprehend academic texts at an appropriate level (Clarence and Bharuthram 2015). According to Mascolo and Castello (2015), many students, specifically first-time entering students, cannot comprehend academic texts on the required level (Mascolo and Casello 2015), as was also found in this study.

The following conclusions, recommendations and implications consequently derived from the findings of this study.

CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS

Mascolo (2020) calls upon higher education to consider the need for structural transformation to adapt to the multiple crises it is facing. The COVID-19 pandemic has furthermore accelerated the use of online learning platforms in general (Ali 2020). It is therefore essential that deep approaches to online reading and learning should be encouraged and facilitated. One way of

doing this is to ensure that all stakeholders involved in the academic enterprise at higher learning institutions are made aware of the extent of the reading demands associated with online reading. They should also note the importance of online reading strategies to access and comprehend online reading material and the impact of online reading on overall academic success.

Clarence and Bharuthram (2015) state that discipline-specific academic reading strategies should be taught to develop reading comprehension and related academic performance in areas such as academic research (Kojo et al. 2018). Policymakers and educators should be alerted to the increasing evidence that additional metalinguistic strategies are required to read, learn and solve problems when utilising online platforms and should be explicitly trained. This evidence will contribute to the academic staff's awareness of online reading's role in academic success (Mascolo and Castillo 2015). Training or workshops, specifically focusing on first time students should be provided as these students are underprepared for the academic demands placed on them at institutions of higher learning. They also have less exposure to online reading than senior students (Mascolo and Castillo 2015). These workshops could also help students overcome the negative influences of online reading, such as addressing potential distractions and equip students with deep approaches to online reading. The training should also help students take down notes and select and extract relevant information from online sources such as academic-related articles to advance comprehension and academic performance (Hooper and Herath 2014). Aspects such as the awareness and application of reading strategies (i.e., summarising, elaborative interrogation) to comprehend reading material and access the curriculum (Azmuddin et al. 2017) could also be included.

Effective training of students on how to use the internet as a platform for learning and applying online reading techniques within the curriculum may result in a positive attitude towards online academic resources, thereby improving reading comprehension and academic performance and may also be beneficial in developing English academic proficiency. This training, in turn, may reduce the dropout rate and increase the throughput at institutions of higher learning.

Training students on the use of internet translation tools, electronic bilingual dictionaries, first-language text related to the subject matter, online explanations and applying online reading strategies can also be employed effectively (Nurhasanah et al. 2020).

Further research should consequently focus on the effect of the remediation mentioned above strategies and monitor academic staff and students' opinions and perceptions of online reading development programmes through surveys and interviews, and monitor student learning outcomes. This research may well assist academic staff in identifying areas for

improvement related to online reading behaviour (Mackh 2018).

Should these recommendations not be implemented, the lack of online reading strategies for students, who are already ill-prepared for higher education's academic demands, will likely persist (Spaull 2013). Clarence and Bharuthram (2015, 42) argue that "an overt focus on critical academic reading as part of disciplinary teaching and learning, ... show how an academic literacy and knowledge-focused approach can be useful to lecturers trying to help their students read in the discipline" and will alter the way students engage with reading material (Mangen et al. 2013).

Limitations of the study

Components that were found challenging, e.g., physical and time constraints, influenced participation in the study during data collection and might have impacted the findings. Additionally, many open-ended questions were answered in a disorganised and vague manner. The participants ignored detail which might have affected their interpretation of the questions.

Due to the limited amount of international (Baker et al. 2019) and South African studies, specifically on disadvantaged students' online reading behaviour, there is a lack of literature to support the presented findings of this study.

Lastly, the limited sample size and the fact that the study is context-specific make generalisation of the results beyond this particular institution of higher learning challenging. This study nevertheless provides a starting point on the topic of disadvantaged students' perception of their online reading behaviour and its impact on their academic achievement.

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