

**STUDENTS' VIEWS OF THE PEDAGOGICAL VALUE OF INFOGRAPHICS IN THE
ONLINE LEARNING MATERIALS OF THE BACHELOR OF LAWS DEGREE AT THE
UNIVERSITY OF SOUTH AFRICA**

by

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Submitted in partial fulfilment of the requirements for the degree

MASTER OF EDUCATION

In the subject

Open Distance Learning

In the

DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL STUDIES

COLLEGE OF EDUCATION

UNIVERSITY OF SOUTH AFRICA

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Students' views of the pedagogical value of infographics in the online learning materials of the Bachelor of Laws degree at the University of South Africa

I declare that the above dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the dissertation to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

25 January 2023

ACKNOWLEDGEMENTS

I would thank several people for their invaluable support and assistance with this study.

Firstly, I would like to thank my supervisors, Dr Faiza Gani and Prof. Geesje van den Bergh, for all their guidance and moral support. Their patience, effort, and specialist insights made it possible for me to complete a research project in a field in which I had no previous experience. I learnt a great deal and will forever be grateful for this experience. I would also like to thank Prof. Salome Schulze for the time spent and guidance on certain methodological aspects of this study.

Secondly, I would like to thank my family. Without them I would not have been able to complete this study: My mother and stepfather, Herna and John Hall; my sister, Mia Bauling, and my cousin, Anya König.

I would also like to thank various colleagues from the Department of Jurisprudence at Unisa for their support and assistance during the time I spent working on this project. They are Ms Liezl Wildenboer, Prof Funmi Abioye, Mrs Annalize Jacobs, Prof. Jan-Harm de Villiers, and Prof. Irma Kroeze.

Lastly, I would like to thank the former Chair of the Department of Jurisprudence, Adv. Konanani Raligilia, for his moral support and the willingness to grant me periods of academic leave.

ABSTRACT

The traditional, text-heavy approach to legal education does not attend to the necessity of developing law students' digital visual literacy, a crucial skill they require to become graduates who are ready for legal practice in today's digital world. Infographics (information graphics) are proliferating social, digital and news media and subsequently educators in higher and online education are embracing this. The inclusion of instructor-generated infographics in the online learning material of students can be used to develop their digital visual literacy. The present study sought to establish students' views of the pedagogical value of infographics in the online learning materials of the Bachelor of Laws degree at the University of South Africa. The learning theory of connectivism informed the study, which was situated within a positivist research paradigm. A quantitative research approach was followed, and a descriptive research strategy adopted. Non-probability, purposive sampling was used to select 196 students to respond to a structured online questionnaire. Data were analysed with the Qualtrics XM™ and IBM© SPSS® Statistics software packages. Descriptive and inferential statistical analysis procedures were utilised in analysing data to ultimately obtain results that answered the main research question. The chi-square and Fischer exact tests were used to reach conclusions with which to address the research hypotheses. The results of the study indicated that the respondents perceived infographics as useful visual learning materials, but that they would also like additional types of visual materials to be included. Students supported the inclusion of additional visual elements in their online learning materials, and neither their ages nor English-language proficiency affected their preferences in this regard. Students' positive sentiments indicated that infographics helped them to better understand complex course materials and increased their enjoyment of the HFL1501 module. The results also indicated that almost half of the respondents did not perceive themselves as adequately visually literate to benefit from infographics as learning materials, illustrating the need to purposively develop this literacy in students. Previous interactions with infographics in an educational context improved students' perceived ability to understand the infographics, but their level of qualification did not.

Keywords: Infographics, instructor-generated infographics, visual learning, digital visual literacy, open distance e-learning (ODeL), online legal education.

SETSOPOLWA

Mokgwa wa sekgale, wa go šomiša, dingwalwa tše ntši go thuto ya tša molao ga o hlokomele tlhokego ya go hlabolla bokgoni bja baithuti ba tša molao go tša titšithale, e lego bokgoni bjo bohlokwa bjo ba swanetšego go ba le bjona gore ba be baithuti bao ba phethilego dithuto gomme ba loketše go šoma ka tša molao ka lefaseng la lehono la titšithale. Diswantšho tša tshedimošo (diswantšho tša go fana ka tshedimošo) di šwahlela go kgašo ya setšhaba, ya titšithale le ya ditaba gomme mafelelong barutiši bao ba lego ka go thuto ya godingwana le ya inthaneteng ba thoma go e šomiša. Go akaretšwa ga diswantšho tša tshedimošo tša go tšweletšwa ke morutiši ka go dingwalwa tša go ithuta inthaneteng tša baithuti di ka šomišwa go hlabolla bokgoni bja bona bja bokgabo bja titšithale. Dinyakišišo tše di nyaka go hwetša maikutlo a baithuti ka ga boleng bja go ruta bja diswantšho tša tshedimošo ka go dingwalwa tša go ithuta inthaneteng tša kgrata ya Molao ka Yunibesithing ya Afrika Borwa. Teori ya go ithuta ya go fana dikgopolo ke yona e šomišitšwego ka mo dinyakišišong, yona e beilwe ka gare ga seemo sa dinyakišišo tša kamano ya tša leago. Mokgwa wa dinyakišišo tša bontši o latetšwe, gomme gwa šomišwa mokgwa wa dinyakišišo tša tlhalošo. Mokgwa wa go dira disampole tša tlhokego ya kgonagalo, tša nepo o šomišitšwe go kgetha baithuti ba 196 go araba dipotšišo tša dinyakišišo tša inthaneteng tša go se fetošwe. Tshedimošo e sekasekilwe ka go šomiša mananeo a softewere a Dipalopalo a Qualtrics XM™ le IBM© SPSS®. Ditshepedišo tša tshekatsheko ya dipalopalo ka go hlaloša le ka tšhupetšo di ile tša šomišwa go sekaseka tshedimošo gore mafelelong go hwetšwe dipoelo tšeo di arabilego potšišokgolo ya dinyakišišo. Diteko tša ditsopolwa tša *chi-square* le tša Fischer di ile tša šomišwa go fihlelela diphego tšeo ka tšona go ka rarollwago haephotesese ya dinyakišišo. Dipoelo tša dinyakišišo di laeditše gore baarabi ba be ba bona diswantšho tša tshedimošo bjalo ka dingwalwa tša go thalwa tša go ithuta tša mohola, eupša gape gore ba nyaka mehuta ya tlaleletšo ya dingwalwa tša go thalwa gore le tšona di akaretšwe. Baithuti ba ile ba thekga go akaretšwa ga dikarolo tša tlaleletšo tša go thalwa ka go dingwalwa tša bona tša go ithuta inthaneteng, gomme mengwaga ya bona goba go tseba polelo ya Seisemane ga bona ga se gwa ama kgetho ya bona mabapi le se. Maikutlo a makaone a baithuti a laeditše gore diswantšho tša tshedimošo di ba thušitše go kwešiša bokaone

dingwalwa tša thuto tše bothata le go oketša go ipshina ga bona ka motšule wa HFL1501. Dipoele di laeditše gape gore tekano ye e nyakilego go ba seripagare sa baarabi ga se ba ipona bjalo ka bao ba nago le bokgoni bja go thala go holega go diswantšho tša tshedimošo bjalo ka dingwalwa tša go ithuta, gomme se se laetša gore go na le tlhokego ya gore baithuti ba be le bokgoni bjo ka maikemišetšo. Dipoledišano tša nakong ye e fetilego tša mabapi le diswantšho tša tshedimošo ka seemong sa thuto di ile tša kaonafatša bokgoni bja baithuti bja go kwešiša diswantšho tša tshedimošo, eupša maemo a bona a dithuto ga se a kgona.

Mantšu a bohlokwa: diswantšho tša tshedimošo, diswantšho tša tshedimošo tša go tšweletšwa ke morutiši, go ithuta go thala, bokgoni bja bokgabo bja titšithale, go ithuta inthaneteng o le kgole (ODEL), thuto ya tša molao ya inthaneteng

OPSOMMING

Die tradisionele, teksbelaaide benadering tot regsonderrig gee nie aandag aan die noodsaaklikheid daarvan om ontwikkelende regstudente se digitale, visuele geletterdheid te ontwikkel nie, wat 'n deurslaggewende vaardigheid is wat hulle moet verwerf om gegradueerdes te word wat gereed sal wees vir regspraktyke in die huidige digitale wêreld. Infografika (inligtingsgrafika) brei sosiale, digitale en nuusmedia uit en derhalwe omarm opvoeders in hoër en aanlyn onderrig dit ook. Die insluiting van instrukteursgeskepte infografika by die aanlyn leermateriaal van studente kan gebruik word om hulle digitale, visuele geletterdheid te ontwikkel. Hierdie studie wil studente se sienings bepaal ten opsigte van die pedagogiese waarde van infografika in die aanlyn leermateriaal van die graad, baccalaureus in die regte, by die Universiteit van Suid-Afrika. Die leerteorie van konnektivisme het die studie, wat in 'n positivistiese navorsingsparadigma gesetel is, geïnspireer. 'n Kwantitatiewe navorsingsbenadering is gevolg en 'n beskrywende navorsingstrategie is gebruik. Nie-waarskynlike, doelbewuste steekproefneming is gebruik om 196 studente te kies om aan 'n gestruktureerde aanlyn vraelys deel te neem. Data is met behulp van die Qualtrics XMTM- en IBM© SPSS-statistiese-sagtewarepakkete ontleed. Beskrywende en afgeleide statistiese ontledingsprosedures is gebruik om data te ontleed ten einde resultate te bekom om die hoofnavorsingsvraag te beantwoord. Die chi-vierkanttoets en Fischer se presisiestoets is gebruik om gevolgtrekkings te maak om die navorsingshipotese te ondersteun. Die resultate van die studie het daarop gedui dat die respondente infografika as nuttige visuele leermateriaal sien hoewel hulle sal verkies dat addisionele visuele materiaal ingesluit moet word. Studente het die insluiting van addisionele visuele elemente by hulle aanlyn leermateriaal ondersteun en nóg hulle ouderdom nóg hulle taalbeheer van Engels het hulle voorkeure in hierdie opsig beïnvloed. Studente se positiewe sienswyses het aangetoon dat infografika hulle help om die ingewikkelde kursusmateriaal beter te verstaan en dit vir hulle aangenamer maak om die HFL1501-module te voltooi. Die resultate het ook gewys dat byna die helfte van die respondente hulleself nie as genoegsaam visueel geletterd sien om baat te vind by infografika as leermateriaal nie, wat die behoefte om hierdie geletterdheid doelbewus by studente te ontwikkel, illustreer.

Vorige interaksie met infografika in 'n onderrigkonteks het die studente se waargenome vermoë verbeter om die infografika te verstaan, hoewel dit nie hulle vlak van kwalifikasie verbeter het nie.

Sleutelwoorde: Infografika; instruurgeskepte infografika; visuele leer; digitale, visuele geletterdheid; oopafstand-e-leer (OdeL), aanlyn regsonderrig

LIST OF ABBREVIATIONS

AI	Artificial intelligence
CHE	Council on Higher Education
DE	Distance education
HE	Higher Education
HFL1501	Historical Foundations of South African Law
ICT	Information and communication technology
LLB	Bachelor of Laws
LMS	Learning management system
MCQ	Multiple-choice question
NQF	National Qualifications Framework
ODeL	Open Distance electronic Learning
POPI Act	Protection of Personal Information Act 4 of 2013
SPSS	IBM® SPSS® Statistics
TEL	Technology-enhanced learning
UNISA	University of South Africa

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CHAPTER 1 ORIENTATION AND BACKGROUND

1.1 INTRODUCTION

Legal education in South Africa, whether facilitated fully online, via blended learning, or via traditional face-to-face approaches, implies a dual responsibility. Law lecturers have a two-fold duty towards their students. Firstly, they must instil subject-specific knowledge, and secondly, develop various critical literacies and skills necessary for students' successful participation in legal practice. Traditionally, the legal skills regarded as paramount have been various literacy and critical thinking skills (Smith & Bauling 2013:609).

Recently, research on both online education and legal education has resulted in a growing understanding of the importance of developing students' digital visual literacy skills (Asimow & Sassoubre 2018; Porter 2018). Dunlap and Lowenthal (2016:44) argue that all learners learn more effectively with visual stimuli, and that ignoring the novel trend of acknowledging and developing these skills, is unsound. Visual literacy is a core digital literacy and can be effectively developed by the pedagogic use of visual resources (Galloway 2017:11). Visual literacy refers to the capacity to effectively interpret imagery (Mason, Morphet & Prosalendis 2006:8). The understanding of both introductory information and complex concepts and terminologies is facilitated more effectively when these are explained by means of a combination of textual and visual learning materials (Porter 2018:9).

As a law lecturer in the developing world, Selvaras (2019:72) argues that online learning, and specifically open distance learning (ODL) "has the potential to generate new patterns of teaching and learning". Selvaras (2019:72) further contends that law lecturers in the ODL sphere can no longer rely on the traditional way law has been taught for centuries, but that they must meet the challenges of the times by embracing technology-enhanced learning (TEL) (Selvaras 2019:72).

Literature searches for the value of visual learning and digital visual literacy in legal education were conducted by means of the library catalogue search tools of the University of South Africa (Unisa) and Google Scholar. All issues of all journals focussing on legal educational research that publish articles in English¹ were consulted. The researcher only found one issue of one journal dedicated to the topic.² No published research on the topic relevant to the context of Africa or the developing world was found. The literature searches therefore indicate that there is insufficient research on the value of visual learning and digital visual literacy in legal education.

It may be deduced that this is because the development of these skills in law students is not regarded as crucial. Legal education facilitated via open distance electronic learning (ODEL) in South Africa must adapt to embrace the importance of developing law students' digital visual literacy skills, but it is presently unclear how this can be achieved.

This study focuses on evaluating students' views of the pedagogical value of infographics as digital visual learning artefacts in the Bachelor of Laws (LLB) degree presented at Unisa. Ultimately, the research aims to determine whether the inclusion of instructor-generated infographics as visual learning materials in the law curriculum presented in an ODeL environment is a viable option to motivate and engage learners and develop their digital visual literacy. In this chapter the researcher outlines the background to the study, the problem statement, research question, hypotheses, and aims and objectives of the study. A brief summary of the research design and research methods employed, as well as the ethical aspects considered, and the steps taken to ensure the trustworthiness of this study are also included.

1 *Journal of Legal Education, Legal Education Review, Journal of Professional Legal Education, European Journal of Legal Education, Journal of Commonwealth Law and Legal Education, Journal of Legal Studies, and Journal of Empirical Legal Studies.*

2 *Journal of Legal Education* 68(1).

1.2 BACKGROUND TO THE STUDY

Between 2012 and 2018 the South African Council on Higher Education (CHE) conceived, conducted, and reported on the national review of the LLB degree in South Africa. For the purposes of this review, a Qualification Standard for the LLB Degree (CHE 2015) was drafted by members of the South African Law Deans Association, in conjunction with the CHE, to provide a set of minimum standards against which each university's LLB degree would be assessed (CHE 2015:4). The purpose of the review was to determine whether the various LLB degrees were designed and presented consistently with the Qualification Standard (CHE 2015). Some of the competencies to be fostered in the LLB qualification included competencies related to communication and literacy, information technology, and problem solving (CHE 2015:10-11).

On the review findings, the final CHE Report identified a worrying tendency across the LLB programmes regarding the lack of an approach towards technology-enhanced learning (TEL) (CHE 2018:41-43). Across the various LLB programmes the use of information and communication technologies (ICTs) as pedagogic tools was sparse and several law schools failed to sufficiently develop competencies related to ICTs, communication, and literacy. This worrying trend indicates the importance of developing strategies to improve the digital literacies of their students. This evidence indicates that a concerted effort is needed to guide law schools on how to use ICTs to support their teaching. It is also evident that law schools should acknowledge the importance of developing the digital literacies of their students. One of the ways in which South African law schools can strengthen their efforts in this regard is to focus on the development of digital visual literacy skills.

Due to their nature, law and legal practice have historically been dominated by text, resulting in a rigid, traditional approach to legal education (Sandford-Couch 2013:145; Porter 2018:2; Roberts 2019:65). In line with this tradition, visual learning materials are used very seldomly, if ever, and as a result there is no focus on visual learning or visual literacies in the presentation of law courses (Sandford-Couch 2013:150; Galloway 2017:2; Porter 2018:9; Roberts 2019:64; Sassoubre 2018:3; 4-5; Sherwin 2018:55). The

reverse is most likely also true: Because legal education has remained inflexible and bogged down by centuries of tradition, legal practice has not been able to evolve to fully embrace today's digital and visual world (Sassoubre 2018: 83; 90-91). But recently the landscape has been shifting at a handful of law schools around the world. Research on the value of developing law students' digital and visual literacy skills has started to appear and legal teaching practice is slowly shifting away from the familiar text-heavy approach (Asimow & Sassoubre 2018:2; Porter 2018:9). Unfortunately, this tendency to consider digital visual literacy as essential to legal education is not yet commonplace at South African law schools.

A significant body of work on legal educational theory and the impact of post-apartheid jurisprudence, subject-specific legal education, and numeracy, literacy, and writing skills development has emerged over the last two decades (Bauling 2017:2-3; Smith & Bauling 2013:606-609). A literature review, focussing on both South African law journals³ and journals publishing on South African higher education (HE)⁴, indicated no research on the pedagogic value of visual learning in law in South Africa.

Unisa employs the ODeL teaching modality, which is characterised by a style of tuition that embraces student-centredness, and lifelong and flexible learning (Unisa 2016). The facilitation of teaching and learning at Unisa engages "blended techniques such as integrated and mixed media, and courseware with various modalities for learning development, facilitation and support" (Unisa 2016). In its policy for the provision of distance education (DE) at South African universities, the Department of Higher Education and Training (2013:16) emphasises high-quality educational resources and artefacts as crucial to the provision of quality DE.

3 All issues of South African law journals were searched. These journals are: *Acta Juridica*, *African Human Rights Law Journal*, *Fundamina*, *Juta's Business Law*, *Mercantile Law Journal*, *South African Journal of Criminal Justice*, *Stellenbosch Law Review*, *South African Journal on Human Rights*, *South African Law Journal*, *Journal of South African Law*, *De Jure*, *De Rebus*, *Employment Law Journal*, *Journal for Contemporary Roman-Dutch Law*, *Potchefstroom Electronic Law Journal*, *SADC Law Journal*, and *SA Law, Democracy and Development Journal*.

4 Literature searches were conducted by means of the Unisa's library search catalogues and databases and Google Scholar for books, chapters, and articles on the topic.

Taking into consideration the necessity of digital visual literacy development of South African law students, the importance of updating legal educational approaches to adequately prepare graduates for practice in a digital world, and Unisa's ODeL teaching and learning style and its focus on the use of ICTs, it becomes clear that a new approach is necessary. Syllabi requiring visually appealing or engaging content are rarely used in online courses (Martin, Wang & Sadaf 2018:59) and ODeL and DE lecturers have a duty to remedy this void.

Infographics (information graphics) may be defined as easy to understand, stand-alone graphic representations, used to convey an entire message through the combination of graphics and text (Alrwele 2017:105). Infographics are an example of the type of visual learning material that can be employed in the online LLB curriculum to address this gap in the syllabi. Infographics are persistently present in all spheres of life and are frequently seen in newspapers, television broadcasts, websites, and social media posts (Alyahya 2019:2). The pervasiveness of infographics in our society, the rise of educational infographics, and empirical evidence of the success of the instructor-provided summary infographic as online visual learning artefact (Gallagher et al 2017:132) make the infographic the ideal visual element on which to base a study of visual online learning in law in South Africa.

Based on the research of Martin, Wang and Sadaf (2018) and Gallagher et al (2017) highlighting the importance of visual learning, and the indication that it is not currently incorporated in the LLB degree at South African universities, the results of this study could provide valuable insight into how to address this gap in (online) legal educational practice. The module, Historical Foundations of South African Law (HFL1501), is presented as part of the LLB degree at Unisa. A study of students' views of the pedagogical value of infographics as a form of digital visual learning material in the module could therefore provide valuable data. The results could provide insight into whether students find infographics useful in the pursuit of mastering complex course material, whether they have the required digital visual literacy to understand infographics as visual artifacts, as

well as how law lecturers can implement visual learning elements in online learning in a pedagogically sound manner.

1.3 THEORETICAL FRAMEWORK

The theoretical framework adopted in this study was that of connectivism. Connectivism as a theory of learning was conceived by Siemens (2005), who related learning to a networked endeavour. He explained that the focus of learning should be on making connections between the self and sources of knowledge so that more connections can be made in future if the knowledge in question is no longer relevant. These connections between the self and sources of knowledge are regarded as networks (Siemens 2005). Transue (2013:185) explains that the process of learning demands the capability to effectively progress through these networks. Connectivism is further based on the assumption that developing the skills to learn continuously, as well as the act of deciding (to learn and from what to learn) are inherently learning processes (Utecht & Keller 2019:117).

The quality and validity of the online content available to learners must be considered carefully to determine the value thereof (Utecht & Keller 2019:112). Digital visual literacy and the ability to learn and relearn from graphics (and determine their reliability) is crucial in today's world, which is flooded with digital graphics. Connectivism accepts that the act of deciding is in itself a learning process (Siemens 2005), which is of importance to this study. Therefore, students should be guided to develop their digital visual literacy to allow them to select visual content as valuable and reliable sources of information, thereby building their ability to learn. While conducting the research demanded by this study, and while progressing through the various phases in the research process, the researcher allowed the theory of connectivism to focus the efforts. Connectivism and how it impacted the study is discussed in greater detail in sections 2.2 (Chapter 2) and 4.3 (Chapter 4).

1.4 PROBLEM FORMULATION

If men [sic] are to be trained for intelligent and effective participation in legal processes, and if law schools are to perform their function of contributing through research to the improvement of law administration, the formalism which confines the understanding and criticism of law within limits fixed by history and authority must be abandoned, and every available resource of knowledge and judgment must be brought to the task. (Currie 1951:334)

Currie's statement remains relevant to this day; it is necessary to bolster legal education by employing every possible resource with which to teach law students. More recently, this approach has been supported by Galloway (2017) and Roberts (2019), who also specifically argue for the pedagogically sound use of visual learning materials in the law curriculum. This also holds true for law students who study at a distance. Porter's (2018:9) assertion that "it's time, thoughtfully, to integrate visual literacy and visual advocacy throughout the law school curriculum" should not be ignored by law teachers at any ODeL institution. The use of visual learning elements can help students feel more engaged in the online learning environment, as the absence of face-to-face teaching and learning can make students feel isolated and disinterested (Gallagher et al 2017:144; Yarbrough 2019:3). Instructional designers and online lecturers who wish to engage students and improve their perceptions of learning materials, should make the effort to understand and master the innovative use of visuals, such as by including infographics in learning materials in the online learning environment (Dunlap & Lowenthal 2016:56; Gallagher et al 2017:144). The instructor-generated summary infographics is one example of the type of infographic that can be included in online visual learning materials (Gallagher et al 2017:129). These support and facilitate both learning and the development of crucial (digital) visual literacies skills (Alyahya 2019:2 Dunlap & Lowenthal 2016:56; Portewig 2004:37).

Within this context it becomes clear that teaching law at an ODeL institution in South Africa requires a shift in pedagogy. A revised pedagogy should rely on the sound use of visual learning materials to deepen student learning and support efforts to improve the

development of literacy competencies in LLB students. In this visually saturated world, where, over time, the importance of visuals as valid and crucial sources of information will only increase, it is paramount that digital visual literacy be regarded as one of the core literacy competencies essential to the LLB graduate.

Steyn, Botha and Mennega (2018) have studied the use of infographics in HE in South Africa and Selvaras (2019) has evaluated teaching law in an ODL environment, but extensive literature searches have not identified any published research on teaching legal history online, or the use of infographics in (online) legal education. Literature searches in this regard were conducted by means of Unisa's library catalogue search tools and Google Scholar. All issues of journals focussing on legal educational research that publish articles in English⁵ and all issues of all South African law journals were considered. To address this lacuna in the literature, the focus of this study is to explore students' views of the pedagogical value of infographics as visual learning materials in the LLB curriculum at a South African ODeL institution. Stated more explicitly, the problem this study wishes to address is the fact that law students at an ODeL institution are not being exposed to visual learning materials, and therefore their visual literacy is not being developed. As a result, they are not sufficiently visually literate to face the challenges that legal practice will present them with.

1.5 RESEARCH QUESTIONS AND HYPOTHESES

With this study the researcher wished to answer the following research question:

What are students' views of the pedagogical value of infographics in the online learning materials of the Bachelor of Laws degree at the University of South Africa?

A quantitative study, such as the one conducted for the purposes of this study, is deductive in nature. Deductive reasoning demands moving from a point of considering

5 *Journal of Legal Education, Legal Education Review, Journal of Professional Legal Education, European Journal of Legal Education, Journal of Commonwealth Law and Legal Education, Journal of Legal Studies, and Journal of Empirical Legal Studies.*

what is expected or anticipated, “to observations that test whether the expected pattern actually occurs” (Delport & De Vos 2011:48). To answer the stated research question, sub-questions were formulated with which to test observations to facilitate answering the main research question. Nine research sub-questions have been formulated and will be answered by this study. These sub-questions are listed below, along with their corresponding null-hypotheses, if applicable. Where null-hypotheses are not stated, the question will be answered by means of simple descriptive statistical analysis.

Sub-question 1: What are students’ views of the relative benefit of each of seven different categories of visual learning elements, namely still images, tables, diagrams, infographics, external video content, recorded live lectures, and humorous visuals?

Sub-question 2: What are students’ views of the extent to which they would like to see infographics included in future study material?

Sub-question 3: What are students’ views of their own visual literacy skills required to understand the infographics in their learning material?

Sub-question 4: Is there a significant difference between the views of students in three different groups (English first-language; English-second language; and English third- or additional language speakers) regarding their desire or not for the inclusion of more infographics in their learning material?

Null-hypothesis:

There is no significant difference between students grouped in terms of their English-language proficiency (English first-language; English-second language; and English third- or additional language speakers) and their desire for more infographics in learning materials.

Sub-question 5: Is there a significant difference between the views of students in two age categories (pre-digital generation; digital generation) regarding

their desire or not for the inclusion of more infographics in their learning material?

Null-hypothesis:

There is no significant difference between students grouped in terms of age categories (pre-digital generation; digital generation) and their desire for more infographics in learning materials.

Sub-question 6: Is there a significant difference between the views of students who were, or not, previously exposed to infographics in an educational context, and their perceived understanding or not of infographics in their learning material?

Null-hypothesis:

There is no significant difference between students who have previously been exposed to infographics or not, and their understanding of infographics.

Sub-question 7: Is there a significant difference between the views of students in four different groups of previous qualifications (matric; certificate / diploma; bachelor's degree; postgraduate degree) regarding their perceived understanding or not of infographics in their learning material?

Null-hypothesis:

There is no significant difference between students grouped in terms of previous qualification (matric; certificate / diploma; bachelor's degree; postgraduate degree) and their perceived understanding of infographics.

Sub-question 8: What are students' sentiments towards the value of infographics in understanding complex concepts and definitions contained in the learning material?

Sub-question 9: What are students' sentiments towards their increased enjoyment of the material attributed to the inclusion of infographics therein?

1.6 AIM OF THE RESEARCH

Based on the main research question, the aim of the study is to gauge students' views on the pedagogical value of infographics as online learning materials utilised in a first-year LLB module presented at Unisa.

With this study the researcher aimed to achieve the following objectives, based on the research sub-questions, namely to determine

- i. which digital visual materials included in the study material were regarded as useful;
- ii. whether students would like to see more visual materials, such as infographics, be included in the LLB curriculum;
- iii. whether students' English-language proficiency impacts their desire to see more infographics included in the learning material;
- iv. whether the fact that students came of age in a digitally driven world influences their desire to see more infographics in the learning material;
- v. whether students regard their visual literacy skills as sufficient to understand the infographics provided;
- vi. whether previous exposure to infographics in an educational context impacts on the visual literacy required to read infographics;
- vii. whether students' level of previous qualification impacts their perceived ability to understand the infographics;
- viii. whether students regard the inclusion of infographics in the study material as influential in the development of their understanding of complex concepts and definitions; and
- ix. whether students regard the inclusion of infographics in the study material as improving their enjoyment of the module.

1.7 RESEARCH DESIGN

In a broad sense, research design refers to all the decisions made during the process of planning the study, namely decisions on the type of design, procedures for data collection, and aspects of measurement and data analysis (Fouché, Delpont & De Vos 2011:143). The researcher now sets out the relevant research design by describing the positivist research paradigm, quantitative research approach, and research strategy based on a cross-sectional descriptive study, as well as how these are appropriate to the study.

1.7.1 Research paradigm

A research paradigm may be considered as a design for gathering and interpreting data (De Vos & Strydom 2011:40). Scientific research is undertaken within a certain research paradigm that demands that the research process and research materials are viewed from a specific vantage point (De Vos & Strydom 2011:41). The research paradigm most appropriate to the overall research design of this study is that of positivism.

Kivunja and Kuyini (2017:31) explain that “the positivist researcher should be able to observe occurrences in the particular phenomenon they have studied and be able to generalise about what can be expected elsewhere in the world”. They further state that research undertaken within the positivist paradigm demonstrates the following characteristics: belief that theory is universal and that it is possible to generalise results across various contexts; an assumption that knowledge is “out there to be discovered”; the presumption that the results of inquiry is quantifiable; and acceptance that research rests on the process of formulating and testing hypotheses, and that it is guided by empirical and analytical approaches inherent in the scientific method (Kivunja & Kuyini 2017:31).

Positivism was well-suited to the current study because its nature is aligned with the chosen research design and methodology, which is discussed in more detail in the remainder of this chapter. Adopting the positivist approach for the present research project was valuable, as the purpose of the research was to gather data on the views of

a sample of students in order to test hypotheses and better understand the respondents' objective reality and views on the topic under investigation. Empirical research was conducted by means of a quantitative study, which employed a questionnaire to gather data on students' views of the pedagogical value of the infographics utilised as learning materials in the HFL1501 module. The data gathered were analysed objectively and produced a description of students' views, alongside inferences drawn based on an analysis of the relationship between various variables identified from the data. In this manner the prescriptions of the positivist paradigm were adhered to, resulting in sound research practices. The positivist paradigm and its specific applicability to this study is expounded in more detail in section 3.3.1, in Chapter 3.

1.7.2 Research approach

This research project entailed a quantitative descriptive study. The data acquired by means of an online self-administered questionnaire gauged students' views of the pedagogical value of the infographics that formed part of the HFL1501 online learning materials utilised in 2021.

Quantitative research may be described as a systematic and objective process of utilising numerical data obtained from a subgroup (or sample) of a population to generalise the results based on the subgroup to the entire population under investigation (Maree & Pietersen 2016a:162). The ultimate results are based on inferences drawn from the relationships between variables, which are investigated as numerical data based on what was collected with the specified instrument (Ivankova, Creswell & Plano Clark 2016:307). Quantitative research methods compile data with the help of predesigned data collection instruments to ultimately facilitate the statistical analysis thereof to reach conclusions (Boeren 2018:66). This study focussed on respondents' views of the use of infographics as visual learning materials. Adopting a quantitative research approach resulted in the collection of quantifiable data that allowed conclusions to be drawn and topics and areas of further studies on infographics and online learning to be identified. A study adopting

this approach also allowed the researcher to quantify respondents' views and present data and results that answered the research question and sub-questions. In section 3.3.2 in Chapter 3, the quantitative research approach is considered more thoroughly.

1.7.3 Research strategy

The research strategy applied to the study in question was that of a cross-sectional descriptive study. Descriptive quantitative research concerns the description of the attributes and features of the population in question to ultimately enable the testing of hypotheses based on the population (Fouché & De Vos 2011:96). A cross-sectional study necessitates the collection of data on one or more variables of interest in a stated population at a single, particular time (Aggarwal & Ranganathan 2019:35). Whereas quantitative data are mainly gathered and analysed to verify the distribution of specific variables, a study is descriptive (Aggarwal & Ranganathan 2019:35). Analysing, summarising, and depicting data collected for a descriptive study requires the application of descriptive statistical techniques (Pietersen & Maree 2016a:204). These analysis techniques necessitate the quantitative data being arranged into separate variables that correlate with individual questionnaire items (Pietersen & Maree 2016a:204). In support of the descriptive statistical analysis, this study will also use inferential statistical analysis to further the comprehensive description of the subject of this study.

The subject of this study is the respondents' views of the use, value, and effect of the summary infographics included in the online study material of the HFL1501 module. The students registered for the module in 2021 make up the population of the study. A more comprehensive discussion of the research strategy is provided in section 3.4.3, in Chapter 3.

1.8 RESEARCH METHODS

To outline the study's research methods, the relevant population, data collection method, and data analysis strategy are described next.

1.8.1 Data collection

The study employed an online quantitative questionnaire to collect both the respondents' demographic data and their answers to questions directly related to the purpose and aim of the study. This study used a questionnaire, a type of survey, as data collection instrument. Online, self-administered questionnaires may comprise closed- and open-ended questions, formulated by the researcher to be centred on the research topic (Braun et al 2021:641). Questionnaires can collect information based on respondents' preferences, views, attitudes, opinions, or biases (Fouché, Delport & De Vos 2011:156). The questionnaire represents a non-experimental research design because the collected data are not used in a related follow-up experiment on research subjects (Maree & Pietersen 2016a:171). The questionnaire designed for this study contained demographic questions and mainly closed-ended questions related to the research question.

The questionnaire used in this study was developed and distributed online with the Qualtrics XM™ software package. Qualtrics XM™ is an online questionnaire suite used in various practices to conduct research in a variety of fields and for diverse purposes (Smith 2021:37). Chapter 3 (section 3.4.1) provides a more detailed discussion of the data collection instrument used in this study, as well as the procedures followed to design and pilot test it.

1.8.2 Selection of respondents

The data collection instrument had to be distributed to respondents to compile the data necessary to conduct this study. The population of the study represented all students registered for HFL1501 in the 2021 academic year (11 444 students). All students

registered for the module received the invitation to participate in the study via e-mail. The entire population was consequently granted the opportunity to participate. The sample consisted of all respondents who returned the completed questionnaire (n=196). The described sampling strategy is consistent with probability sampling, which requires that each member of the population has an equal chance of making up the sample (Maree & Pietersen 2016b:192). The population and sample of this study is discussed again in section 3.4.2, in Chapter 3.

1.8.3 Data analysis

To arrive at data that can effectively be utilised to answer research questions, raw data collected with a questionnaire must undergo a process of analysis (Fouché & Bartley 2011:249). In a quantitative study this is achieved through analysis and interpretation of numerical (nominal) data. The data analysis techniques employed for the purposes of completing this study were descriptive and inferential statistical analysis.

The analysis of quantitative data facilitates the process of making inferences and generalisations to entire populations based on the data gathered from only a sample thereof (Zaker & Nosratinia 2021:14). While descriptive statistics allows for the exposition of the basic characteristics of nominal data, inferential statistical analysis facilitates the process necessary for making conclusions based on the initially analysed data of more than one variable (Kaur, Stoltzfus & Yellapu 2018:60, 63). Two software packages were used to facilitate the statistical analyses required for the data analysis phase of this study, namely Qualtrics XM™ and IBM® SPSS® Statistics. A more comprehensive discussion in this regard is provided in Chapter 3 (section 3.4.3).

1.9 ETHICAL MEASURES

Strydom (2011a:114) defines research ethics as a set of generally accepted moral standards that provide rules and behavioural guidelines for the most appropriate conduct towards all subjects, respondents, assistants, sponsors, and fellow researchers involved

in a scientific study. Before conducting the empirical research necessitated by this study, the researcher applied for the obligatory ethical clearance certificates to the University of South Africa's College of Education Research Ethics Committee and the University of South Africa's Research Permission Sub-Committee of Senate, which was granted.

While conducting the research relevant to this study, the researcher adhered to the following ethical guidelines (as set out by Strydom 2011a:115-122) in order to prevent any risk or harm to respondents of the study: respondents were informed that their participation in the study was voluntary; all respondents were required to provide informed consent before being allowed to participate; respondents were not deceived; the privacy, anonymity and confidentiality of respondents were respected and protected; and respondents were not compensated for their involvement in the study. The study also adhered to the requirements of the Protection of Personal Information Act 4 of 2013 (POPI Act), which legislates how the personal information of research participants should be managed. The POPI Act details, inter alia, directives on the collection, use, and storage of data on research participants. The adherence to ethical measures is also discussed in section 3.6, in Chapter 3.

1.10 VALIDITY AND RELIABILITY

Validity and reliability refer to the level of trust that can be placed on the outcome of quantitative research. When a standardised measuring instrument (such as the questionnaire designed for this study) is used, its reliability and validity must be assessed (Pietersen & Maree 2016b:238). Validity entails how effective a data collection instrument is at measuring what it was designed to do (Pietersen & Maree 2016b:239). Reliability involves safeguarding the consistency of results based on data gathered with the same instrument at various times (Pietersen & Maree 2016b:238). This study is based on a non-experimental and cross-sectional design and subsequently it is unnecessary to classify the reliability of the questionnaire, as it was only administered once. It is therefore paramount to consider the potential threats to the research validity of this study (Zaker &

Nosratinia 2021:13). Face validity and content validity are the only categories of validity applicable to this study because of the nature and scope thereof and the type of questions included in the questionnaire. A detailed analysis of the relevant elements of validity, as well as how each of these were addressed in this study, is provided in Chapter 3 (section 3.5).

1.11 CLARIFICATION OF CONCEPTS

This section describes and defines terminologies essential to the study. These definitions are scholarly in nature or derived from interpretations of various scholarly sources.

Pedagogy

Translated from Latin, pedagogy is “the art or science of teaching to children” (Shah 2021:6). Today, pedagogy may be defined as the practice and methods relevant to teaching (Oxford English Dictionary 2022). Pedagogy also refers to the relationships and exchanges between educators, students, the learning environment, and learning activities (Shah 2021:6). Mampane (2015:46) argues that pedagogy may also be considered as the scholarship of teaching and learning. Along these lines pedagogic theory is described as “a systematic conceptualization of the process of education and conditions of human development in both the individual and the societal life sphere” (Shah 2021:8). Pedagogy goes beyond purely connoting the act of teaching, “but reflects the production of broader social and cultural values within the learning relationship” (Shah 2021:7). As a field of study, pedagogy has developed significantly over the centuries. Of interest is Brown et al’s (2022:284) argument that the growing implementation of online HE requires a specific focus on, and development, of fit-for-purpose online pedagogies focussed on successful student transition and engagement.

Digital literacy

Biezā (2020:2) explains that researchers of digital literacy are often inclined to use the term without defining it, and that many use it interchangeably with technology literacy and media literacy. Based on a systematic literature review and subsequent data analysis, she defines digital literacy as a multifaceted competency that encompasses

using digital tools to master new digital technologies and ensuring their most efficient use; ... critically using digital resources; choosing, evaluating and circumspectly applying digital technologies and media content; [and] modern skills which are a significant part of social life, requiring reflection on one's own security and responsible behaviour within the digital environment (Biezā 2020:9).

She also notes that digital literacy is “a tool for learning, a material to learn from, and a ‘horizons expander’” (Biezā 2020:7).

Visual literacy

Mason, Morphet and Prosalendis (2006:8) define visual literacy as, in essence, the capacity to read and understand imagery. Benoît (2016:61) describes it as a skillset used to both produce images and extract meaning from them. He regards visual literacy as the competency to interpret and translate visuals, which suggest the “personal ingesting of a source message” to make sense of it for the self, or to communicate it meaningfully to others (Benoît 2016:63).

Digital visual literacy

Spalter and Van Dam (2008:94) define digital visual literacy as the capacity to create and understand computer-generated visual information. To them, this implies the ability to critically evaluate two-dimensional, three-dimensional, still and moving digital visual

resources. This specific literacy also entails the capacity to make sound decisions based on digital visual data (Spalter & Van Dam 2008:94). Portewig (2004:40) defines digital visual literacy as the capacity to think, analyse, and communicate visually.

Infographic

Simply put, infographics can be explained as visual representations of content (Alrwele 2017:105). Infographics are uncomplicated graphics, frequently presented as a story, or without text (Alrwele 2017:105), which illustrate concepts in context with one another (Dunlap & Lowenthal 2016:56). Conclusively defining an infographic is not a straightforward task, as will be discussed in greater detail in the literature review provided in Chapter 2. For the purposes of this study an infographic is regarded as a stand-alone visual representation of content, consisting of a combination of textual and visual elements, employed to convey an entire message in an easily understandable way.

LLB degree

The *Legum⁶ Baccalaureus* (Bachelor of Laws), or LLB, is an entry-level law degree (Legal Information Institute [sa]). The degree “prepares students for entry into legal practice, into a wide range of other careers which require the application of law, and for post-graduate studies in law” (CHE 2015:8). In terms of the National Qualifications Framework (NQF), the South African LLB degree is a four-year degree, and the exit-level is NQF level 8 (CHE 2015:8). Traditionally law degrees, such as the LLB, have been taught with a strict and traditionalist focus on text-heavy sources and pedagogy (Roberts 2019:65; Porter 2018:9).

6 “*Legum*” (laws) is the plural for of “*legis*” (law), indicating that the subject matter of this degree was two separate legal systems. The two legal systems originally studied in this degree were canon law (the law of the Catholic Church) and civil law (based on the European development of Roman law) (University of Cambridge [sa]).

1.12 DIVISION OF CHAPTERS

This research study is presented by dividing the contents thereof into the following chapters:

Chapter 1: Introduction and Overview

In the first chapter the researcher provides a general introduction to the study. The chapter includes a contextualisation of the importance of visual learning and literacy in both ODeL and online legal education. This chapter also contains a description of the background to and rationale for the study, the problem formulation and aim of the study, a summary of the research methodology employed, a brief discussion of considerations regarding ethics and validity, as well as a clarification of the concepts crucial to the study.

Chapter 2: Literature Review

Chapter 2 consists of a detailed review and synthesis of recent literature relevant to the topic, as well as an exposition of the appropriate theoretical framework, namely connectivism. The literature review focuses on online legal education, visual learning, digital visual literacy, infographics (with specific focus on the instructor-generated summary infographic), and visual learning materials and pedagogy.

Chapter 3: Research Methodology

The third chapter contains a description of the research methods and ethical considerations underlying the study. The researcher expounds the research design, and more specifically, the research paradigm, approach, and strategy; and the research methods, explaining the applicable sampling technique, data collection instrument, and data analysis process. The measures taken to ensure the validity of the study and its results are also described in this chapter.

Chapter 4: Results and Discussion of Empirical Research

Chapter 4 provides an overview of the key results of the study and discusses these alongside significant issues identified in the literature review. The data and results are synthesised into a meaningful product that achieves the initial aim and goals of the study.

Chapter 5: Conclusions, Recommendations and Limitations

The closing chapter contains a summary of the results of the study and draws several conclusions. Based on the results, the researcher makes recommendations for ODeL and online legal teaching practice. The researcher also identified the limitations of the study and potential areas for future study.

1.13 CONCLUSION

In this chapter the researcher sketched the background to this study, the formulation of its problem statement, the research questions that arose from this, and the aims and objectives of the study. The chapter provided a summary of the relevant theoretical framework, the research design and research methods employed, as well as the relevant ethical aspects considered in this study. The researcher described the elements of validity considered during the empirical research phase of this study, its key concepts, and lastly, the division of its chapters.

The next chapter consists of a literature review of previously published research relevant to the focus of this study, as well as a discussion of the theoretical framework foundational thereto.

CHAPTER 2 THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to investigate literature pertinent to the research topic and that which was empirically investigated in this study. This chapter examines the theoretical framework of connectivism and provides a description of its relevance to this study. A visualisation of the interrelated nature of the theoretical framework and the literature on the concepts central to the study provides a fitting bridge to the literature review that follows.

The literature review provides an understanding of current academic positions on visual learning, digital visual literacy as a core competency for today's online student, and the value of educational infographics. The potential importance of educational infographics in TEL and ODeL, and their likely pedagogic impact is also investigated. The chapter concludes with an exposition of present and potential future developments in legal practice and legal education, and the crucial role digital visual literacy will play in these developments. Before discussing the literature relevant to the study, an exposition of connectivism is provided to give context to the discussion.

2.2 THEORETICAL FRAMEWORK

De Vos and Strydom (2011:35) explain that the research process starts with a set of ideas about the nature of the phenomena to be investigated. These ideas represent the theoretical framework of a study. This framework influences the research questions covered in the study, as well as the methodological approach adopted to do so (2011:35-36). The theoretical framework governing this study is that of connectivism.

Siemens (2005) sets out the learning theory of connectivism and relates learning to a networked endeavour. He argues that the goal of learning should be to make connections between the self and sources of knowledge, to facilitate the creation of different

connections in future if the knowledge in question is no longer relevant. Transue (2013:185) explains that, according to connectivist thinking, knowledge encompasses networked relationships and that the process of learning demands the capability to effectively progress through these networks. Zoccoli (2019) relates this process of learning to a student's personal learning journey. Today connectivism is regarded as both a theory of learning and a pedagogical approach (Downes 2019:113) and is also described as a theory of knowledge (Downes 2019:115), which is a more recent conception.

The theory of connectivism accepts that learners continuously acquire new information and that they need skills to be able to determine what is valuable information, and what is not (Siemens 2005). Connectivism thus involves learning how to learn and how to generate new knowledge (Downes 2019:113). A connectivist approach to learning also nurtures critical thinking and deep learning (Downes 2019:123). Zoccoli (2019) explains connectivism as a learning endeavour involving a “dynamic interconnection”, or alliance, between human and technological components. Her visual illustration of this relationship is depicted in Figure 2.1, below.

Siemens (2005) identified eight principles of connectivism, but due to the limited scope of this study only the two principles most directly related to this study are discussed. These are the principles that the ability to know more is more important than what is presently known, and the fact that decision-making is regarded as a learning process in and of itself (Siemens 2005). The latter principle relates to the fact that learners decide what it is that they wish to learn, and that they understand that the knowledge obtained in this regard belongs in a shifting reality – over time it may no longer be regarded as valuable knowledge (Siemens 2005).

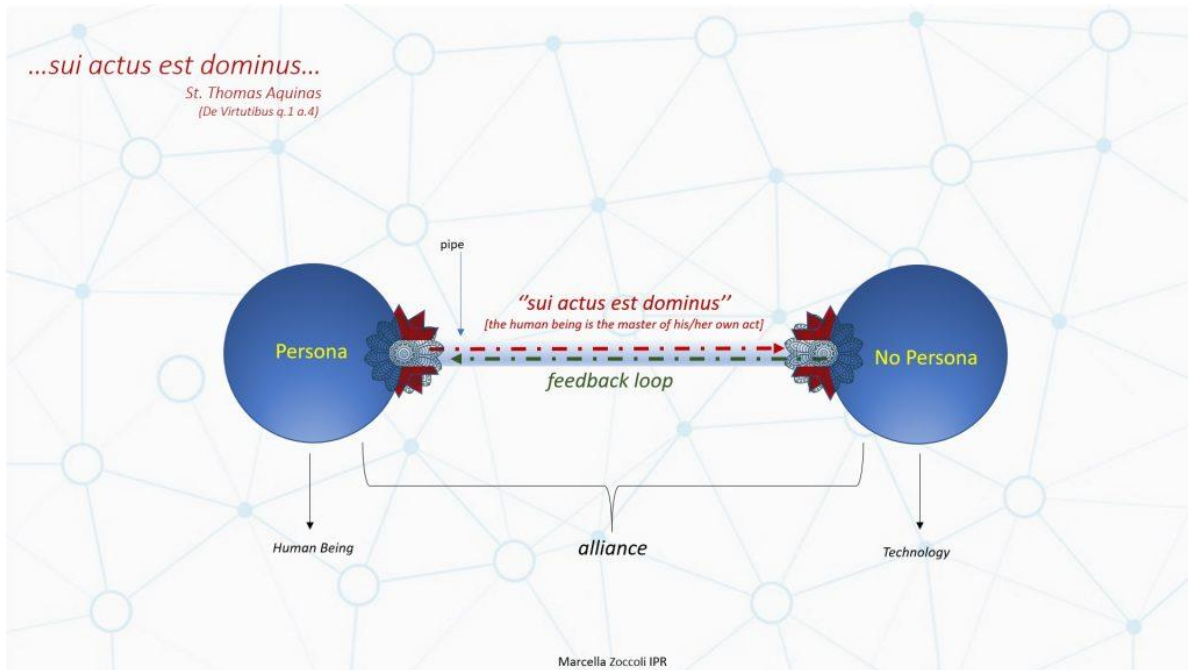


Figure 2.1: The learning alliance between Persona and No Persona (Zoccoli 2019)

The former of these two principles relates to the fact that the learner needs to learn how to keep on learning, and for this, specific literacies and skills are required. The quality and validity of the online content available to learners must be considered carefully to determine the value thereof (Utecht & Keller 2019:112). Digital visual literacy and the ability to learn and relearn from graphics (and determine their reliability) is crucial in today's world, which is flooded with digital graphics.

The principle of connectivism that dictates that the act of deciding is itself a learning process, is also of importance to this study. Utecht and Keller (2019:117) argue that this principle extends to the ability to select information, which is also a learning task. Understanding the need to continuously evaluate sources of knowledge is a crucial life and learning skill of the information age (Utecht & Keller 2019:117). Over time the importance of understanding graphic content and communicating crucial information through graphics will only become more critical. Therefore, students should be guided to

develop their digital visual literacy to enable them to select visual content as sources of information, thereby building on their ability to learn and grow their knowledge networks.

Siemens (2005) argues that connectivism has implications for the design of learning environments. This illustrates the relevance of connectivism to visual learning. It may be argued that connectivism also has implications for the design of individual learning artefacts, such as infographics. Downes' analysis of new research based on connectivism indicates that one of the ways in which connectivism may be incorporated into educational research is to determine whether it is a useful learning theory and can be applied in practice within a specific context (Downes 2019:124). Zoccoli (2019) supports this notion, stating that connectivism "lends itself to multiple interpretations and readings", which allows for its effortless integration into a study evaluating visual learning and the potential value of infographics. While conducting the research required for this study, and while progressing through the various phases in the research process, the researcher let the theory of connectivism guide and focus the research process.

2.3 VISUALISING THE THEORETICAL AND CONCEPTUAL FRAMEWORK

To place the discussion in the remainder of this chapter into context, the researcher provides a visualisation of the interrelationship between the theoretical framework applicable to the study, namely connectivism, and the relevant conceptual aspects that emanated from the literature review (visual learning, digital visual literacy, pedagogy, and infographics). Figure 2.2 illustrates how these concepts, the theoretical framework, and the context of this study are interrelated.

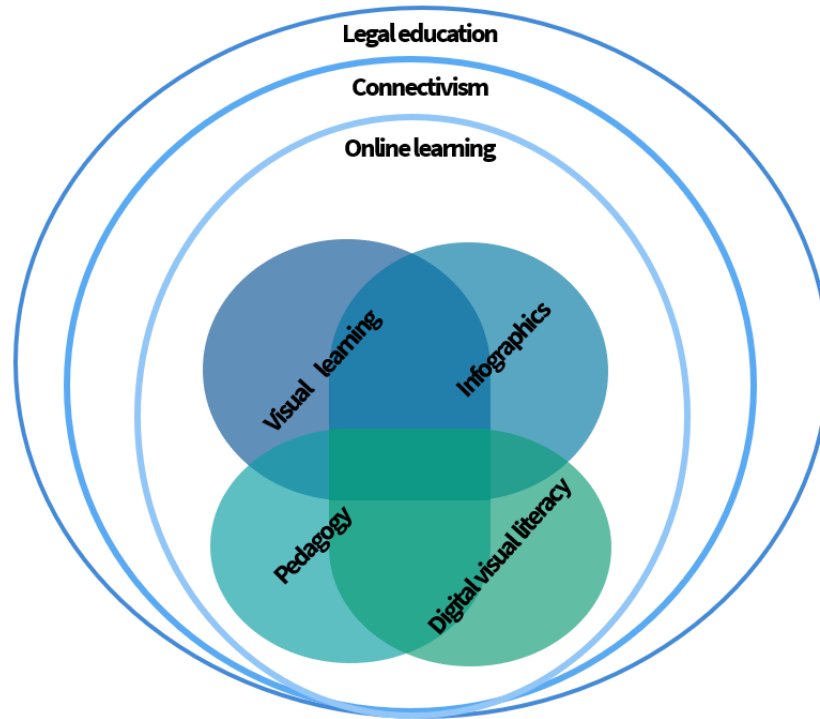


Figure 2.2: Visualisation of the theoretical and conceptual framework of the study

The concepts represented in Figure 2.2 and their association with one another are evaluated as they pertain to online learning; function within the framework of connectivism; and are appropriate for a reimagined approach to legal education. Relevant literature on these concepts is discussed below.

2.4 VISUAL LEARNING

Dunlap and Lowenthal (2016:44) argue that visual learning materials support all learners and that visuals support recall and cognitive processing by providing context. When visual representations of information are included in learning materials they draw students' attention and deepen their engagement with these materials (Alrwele 2017:105). New concepts, terminologies, and complex learning material are often understood better when clarified by means of a combination of text and visuals, as opposed to the use of text

alone (Porter 2018:9). Roberts (2019:74) explains that “imagery has profound pedagogic value because human beings are ‘dual processors’ of information”. Dziwa (2018:1) makes the compelling argument that, by failing to include visuals in the learning materials created for ODL students, lecturers are doing their students a disservice. Jordaan and Jordaan (2013:79) argue that South African HE learners are disadvantaged by the failure to regard visual literacy as crucial to all curricula, regardless of the modality of tuition.

Digital visuals now have significantly greater importance than ever before (Portewig 2004: 31; Benoît 2016:63) and social media is one of the great drivers of the “visual turn” predominant in today’s world (Jordaan & Jordaan 2013:78). Therefore, when learning materials are devoid of visual elements, “[l]earning becomes divorced from the world in which the learner lives” (Dziwa 2018:1). In our visually rich world students are constantly interacting with images in online environments, but interaction alone does not result in the development of better visual literacy skills (Matusiak et al 2019:134). Students need to be supported to develop visual interpretation skills to help their ability to learn from the visuals they are bombarded with daily (Asimow & Sassoubre 2018:7). Doing so demands that visual literacy development be infused in HE curricula, both globally and specifically in South Africa (Jordaan & Jordaan 2013:77; Kędra 2018:68).

Alford (2019:158) supports the notion that students need to develop the skills required to evaluate images critically and adds that these skills should also be taught as they relate to the interpretation of infographics specifically. She argues that curricula that employ visual texts stimulate both visual and critical thinking, which are both necessary skills in our digital world (2019:159). Galloway (2017:2) argues that today’s law graduate also requires these skills and literacies.

2.5 DIGITAL VISUAL LITERACY AS CORE COMPETENCY

The fact that we live in a visually infused culture is generally not regarded in a positive light (Spalter & Van Dam 2008:98), as is evident from the traditional approach to legal education. Portewig (2004:32) makes specific reference to the commonly held belief that,

in instruction materials specifically, visuals are inferior to text: “The lack of faculty encouragement, student perceptions of text as a more valuable scholarly representation, and limited instruction in how to use images in academic work support arguments that higher education has not embraced visual literacy” (Matusiak et al 2019:134).

However, the transformative influence of digital technology in the educational sector has significantly amplified the relevance of visual literacy (Matusiak et al 2019:124). Technological innovation has transformed educational practice and has impacted the teaching and learning of visual literacy, which in turn has a marked influence on the transfer of information (Alyahya 2019:1). Effectively integrating ICTs in HE, and producing graduates who are ready for their profession, demands that today’s lecturers continuously design new pedagogic learning experiences (Agostinho 2011:961).

Visual literacy is a dynamic and crucial digital literacy and can be effectively developed through the pedagogic use of visual resources (Galloway 2017:11). Portewig (2004:32-33) explains that visual literacy should not be regarded as a set of peripheral skills or as being similar to basic literacies related to reading and writing. She argues that various literacies are meant to be taught as overlapping to have true pedagogic value: “Grounding pedagogy in multiple literacies provides a solid foundation for students, preparing them with more than skills but with the ability, knowledge, and/or understanding of [other] literacies such as rhetoric, ethics, and technology” (Portewig 2004:33).

Many educators also question the necessity of studying the visual “when we all learn how to see with no apparent effort at all” (Spalter & Van Dam 2008:96). There is a reigning assumption that because those of us without visual impairments can easily see and identify objects without any instruction, this capacity need not be studied academically (Portewig 2004:33; Spalter & Van Dam 2008:96). However, living in the age of the inexpensive computer graphic has made it clear that studying the visual characteristics of academic and cultural discourse is paramount, and that visual literacy should be included in the curriculum (Spalter & Van Dam 2008:93). Spalter and Van Dam (2008:100-101) assert that “the time has come to add [digital visual literacy] to the

traditional textual and mathematical literacies as a basic skill required for educated citizens and productive participants in the knowledge economy of the 21st century”.

Matusiak et al (2019:134) point out that when lecturers employ images, this is done almost exclusively in PowerPoint presentations. To be employed effectively, digital visual content should be included in learning materials in various ways. Variety in the type of visuals (video, photographs, graphics) would also be of value. One example of the type of digital visuals that could be included in online learning materials is the infographic. Instructor-provided summary infographics are suited to online learning environments, as this environment is a “dynamic space for instructional design innovation” (Gallagher et al 2017:129).

This transformative influence of ICTs on learning environments relates directly to the principles of connectivism. As the nature of the networks in which, and technologies from which, students learn changes, so students need to be prepared to learn in these changing networks and systems. This can be achieved by developing their digital visual literacy skills.

2.6 INFOGRAPHICS

Alyahya (2019:1) describes the infographic as the quintessential embodiment of visual communication in our digital era. Infographics are present in all spheres of life, and we are bombarded with them in news articles, television broadcasts, and social media posts, as well as on many websites (Alyahya 2019:2). To understand infographics and their potential value in ODeL and online legal education, it is essential to define infographics, illustrate their role in DE, understand their role in communication, pedagogic value and effective use, investigate various types of educational infographics, and review existing research on students’ views of the value of infographics in online learning materials. A discussion of these aspects follows.

2.6.1 Defining infographics

In simple terms, infographics (a portmanteau of “information” and “graphics”) can be explained as visual representations of content (Alrwele 2017:105). Infographics are easy to understand, stand-alone graphic representations that are employed to convey an entire message, often in the form of a story or without accompanying text (Alrwele 2017:105). While Uyan Dur (2014:5) has a strict definition of an infographic, describing it, inter alia, as having procedural elements that ultimately sway viewers’ thinking and potentially change their conduct in real life, Lankow, Ritchie and Crooks (2012:20) argue that there is no bottom limit, or minimum requirement for how complex an infographic should be to qualify as such.

There is no consensus among researchers on the required elements of an infographic either. It is, however, universally accepted that infographics should contain graphic elements that illustrate the relationship between concepts to provide context to the information contained therein (Dunlap & Lowenthal 2016:56). Infographics may contain various visual elements, such as charts, maps, icons, arrows, graphics, and images. The main reason for including these visual elements is to ease and support the effective flow and communication of information, which ultimately facilitates data interpretation and learning (Alyahya 2019:2).

Benoît’s (2016:70-71) discussion of a general information visualisation is directly relatable to infographics in that it describes a fit-for-purpose composition: “Like art, a created ‘information visualization’ is composed of identifiable features, a combination of texture, form, and space that pleases. Computer-based ‘art’ intended to be deciphered and interpreted to convey useful facts are created with a purpose: that is, to inform.”

2.6.2 Examples of infographics

As an illustration of the dichotomy created by varying academic opinions on the elements of and requirements for informative graphics to qualify as infographics, as well as their varying purposes, some examples are provided and discussed.

Seagate Technology is an American public company specialising in data storage devices and cloud-based storage facilities (Seagate 2021). The company has published an infographic (Figure 2.3) that illustrates the importance of regularly creating back-ups of one’s data, while simultaneously marketing their services and products. This infographic contains the findings of their market research on consumers’ behaviour.

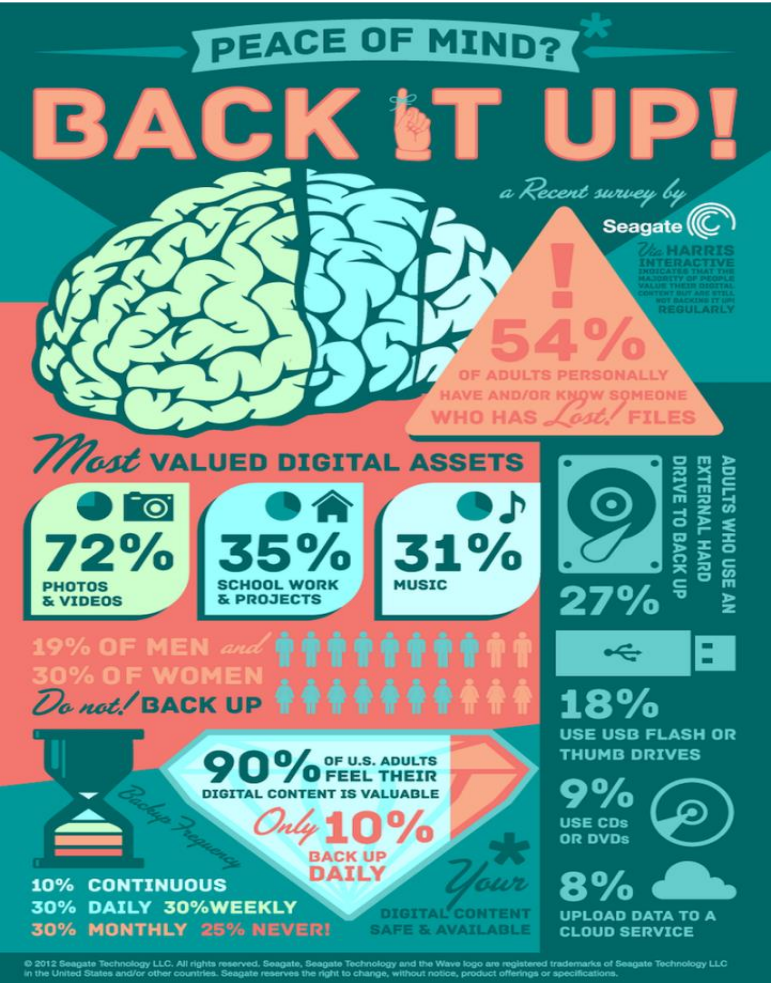


Figure 2.3: Seagate’s data-driven marketing infographic (Venngage 2021)

Some infographics do not contain statistics or extravagant visual elements, but nonetheless communicate their message effectively. Figure 2.4, an infographic on social

distancing, was created by Ottawa Public Health to inform the local community on how to prevent Covid-19 transmission.



The infographic is titled "Social Distancing Checklist" in a dark teal box at the top. Below the title, there are two main sections, each with a red header bar and a white content box. The first section is for individuals with respiratory symptoms, and the second is for all residents. Each section contains a list of instructions, each preceded by a teal circle. At the bottom, there is a dark teal box with the source URL.

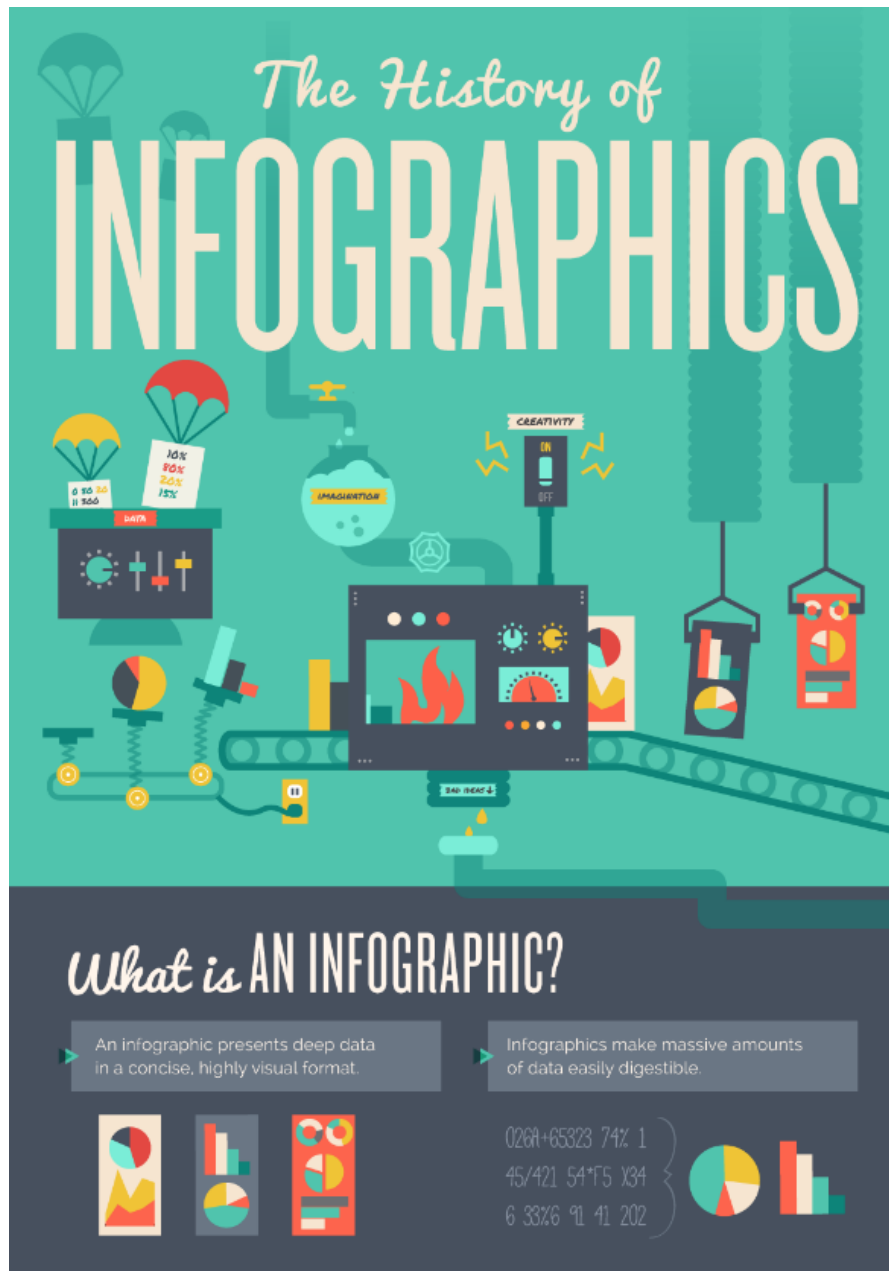
Social Distancing Checklist

- For individuals with respiratory symptoms (fever, cough)
 - You must self-isolate for 14 days, or 24 hours after symptoms have FULLY resolved, whichever is longer.
 - You must not leave your home if you have respiratory symptoms.
 - If your symptoms are worsening to a point where you cannot manage at home, please visit your nearest emergency department.
- For ALL residents (except those listed above)
 - Practice physical distancing – Avoid all non-essential trips in the community.
 - Household contacts (people you live with) do not need to distance from each other unless they are sick, or have travelled within the past 14 days.
 - Cancel ALL group gatherings. Connect via phone, video chat, or social media instead of in person.
 - Talk to your employer about working from home (if possible).
 - Avoid visiting elderly friends or relatives unless the visit is essential.
 - You can go outside (for example - to take a walk). While outside, avoid crowds and maintain a distance of two metres (six feet) from those around you.

Source: <https://www.ottawapublichealth.ca/en/public-health-topics/social-distancing.aspx>


Figure 2.4: Social distancing checklist infographic (Ottawa Public Health 2021)

Some infographics are so comprehensive that they may be considered to contain an overload of data. Some span several pages (in print) or require significant scrolling on a digital device. Figure 2.5 contains excerpts from an extensive infographic on the historical development of infographics. It contains various visual representations of data, such as graphics, photos, timelines, and charts. The full infographic may be viewed [here](#).



(infographic continues on next page)


Prehistoric GRAPHICS



1
SERRA DA CAPIVARA
The earliest graphical depictions of information occurred on cave walls.


ESTIMATED AT
25,000 YRS OLD

The rock art may be the oldest work of its kind in the Americas.




2
DUNHUANG STAR ATLAS
The oldest atlas of its kind, dates back to sometime between 649 and 684 AD.

IT CHARTS MORE THAN
1,300 STARS



★ - 100 stars




• - 5k years 25,000 PRESENT

Early Printed INFOGRAPHICS


WILLIAM PLAYFAIR The father of modern statistical graphs.

Playfair invented the:


TIME-SERIES
LINE GRAPH






PIE CHART



BAR CHART



1600	1686		EDMUND HALLEY	Created the first known bivariate plot .
1700	1701		EDMUND HALLEY	Created the first data-based contour map .
1800	1858		FLORENCE NIGHTINGALE	Created the coxcomb chart .


20th Century INFOGRAPHICS

1915

ALFRED LEETE

A poster designed by Leete and published by the London Underground displays many of the visual and **data elements** still used in infographics today.

London Underground Poster




1972

OTL AICHER

Aicher brought **simplified pictograms** onto the scene in a clean, sleek manner that made them a universal means of communication.

1972 Munich Olympics




1970s+

PETER SULLIVAN

Graphic designer Peter Sullivan created **infographics** for "The Sunday Times" in the **1970s, 80s, and 90s** that would go on to inspire similar graphics in other publications.

"The Sunday Times"



(infographic continues on next page)

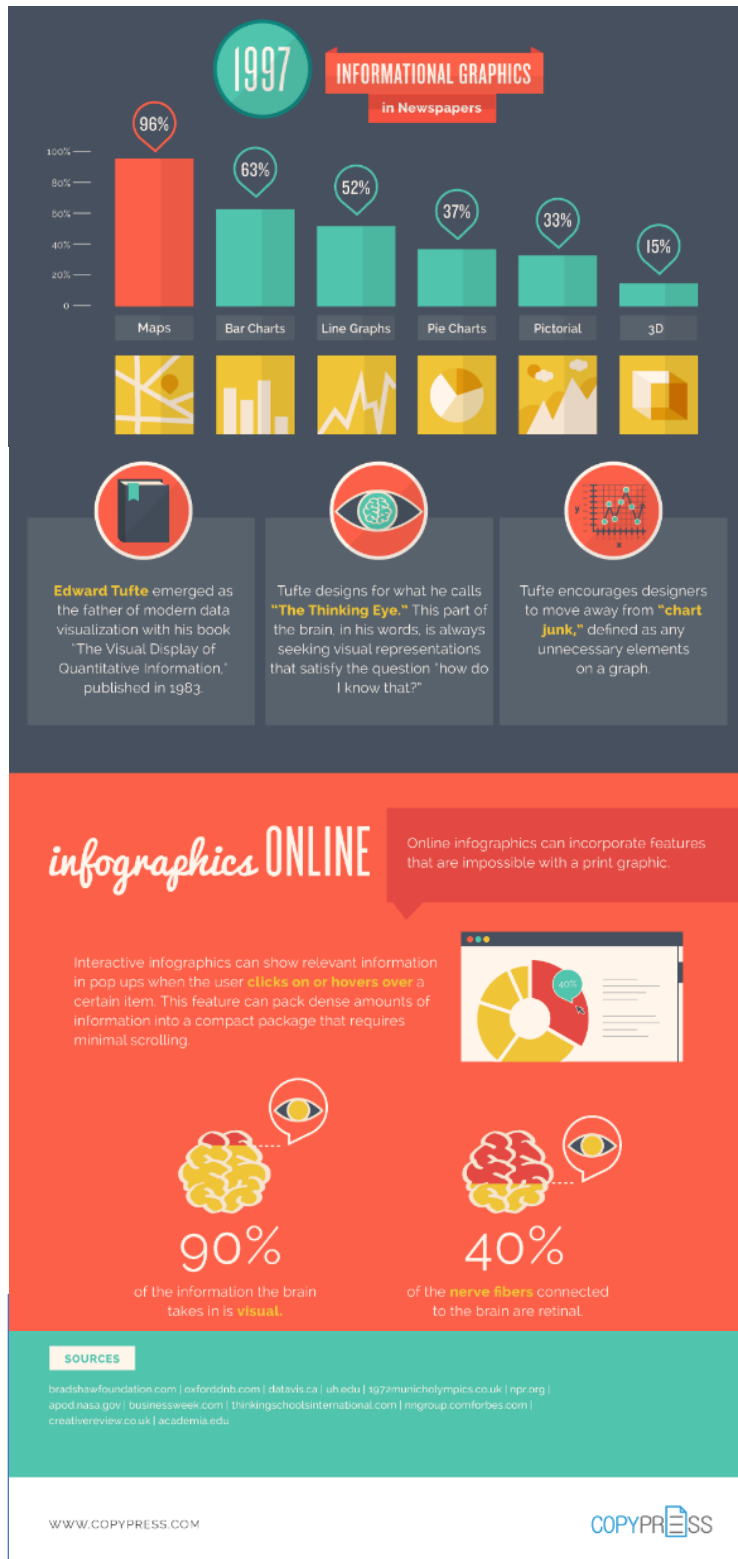


Figure 2.5: Excerpts from an infographic on the history of infographics (Copypress 2021)

Another example of a simple infographic is illustrated by Figure 2.6. This infographic uses a straightforward Venn diagram that effectively illustrates the relationship between categories of writing and how they relate to one another.

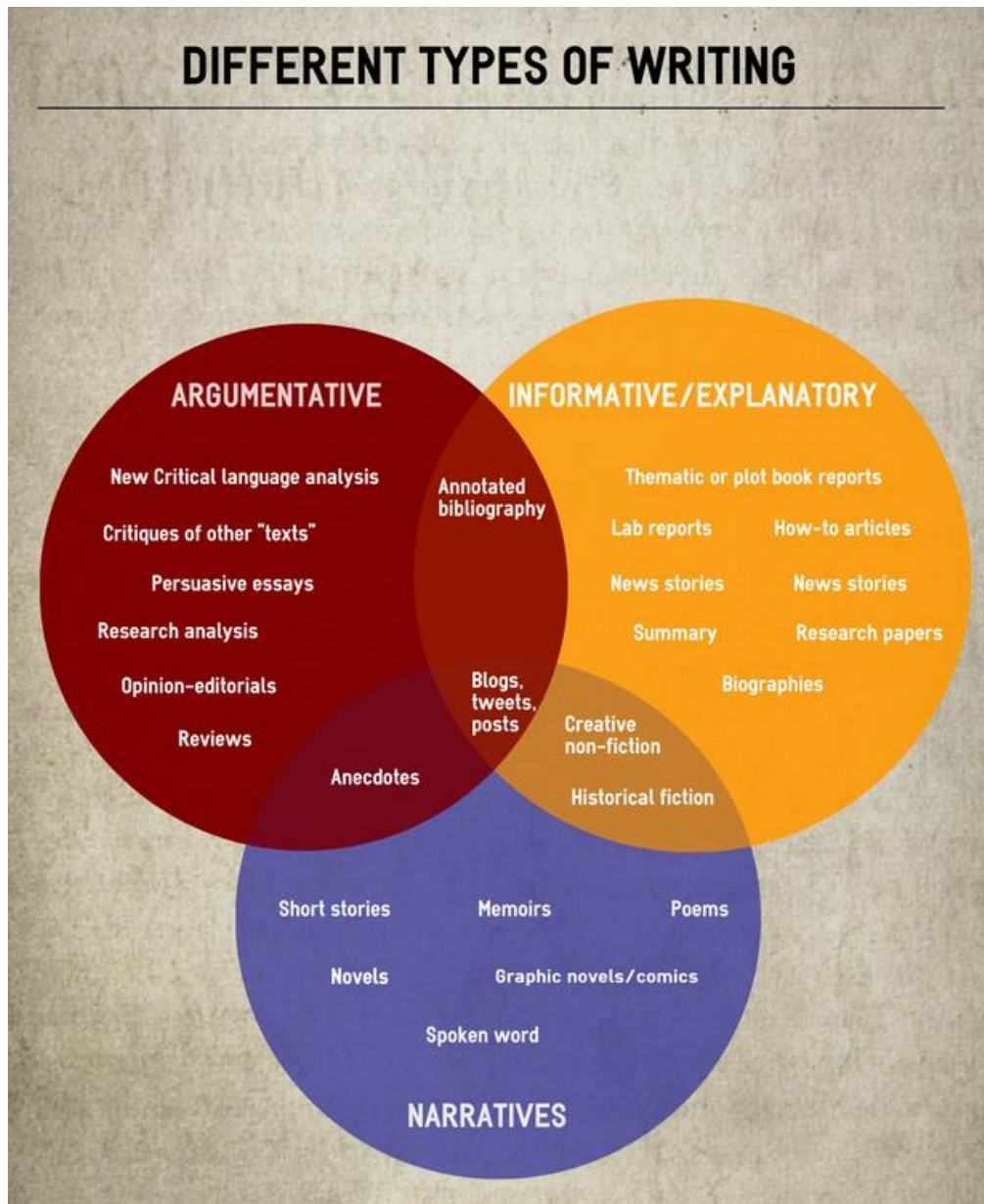


Figure 2.6: Infographic on different types of writing (Tomboc 2020)

The disparity in design and scope of content of these four infographics provides a visual illustration of the varying views of Alrwele (2017), Alyahya (2019), Dunlap and Lowenthal (2016), Lankow, Ritchie and Crooks (2012), and Uyan Dur (2014) on what constitutes an infographic. Based on these descriptions, definitions, and examples it can be concluded that an infographic is a visual representation of content that contains graphic elements to facilitate interpretation and learning by creating context (Alrwele 2017:105; Alyahya 2019:2; Lankow, Ritchie & Crooks 2012:20). For the purposes of this study, an infographic is considered to be a stand-alone visual depiction of content, comprising a combination of textual and visual elements, used to convey an entire message in a comprehensible manner.

2.6.3 Infographics, conveying information at a distance, and DE

The practice of communicating through images started thousands of years ago, when humans first created cave and rock paintings (Bicen & Beheshti 2017:100). Heydenrych and Prinsloo (2010:11) argue that the purpose of these paintings was to inform, and educate following generations, and may therefore be regarded as the early roots of DE. Yarbrough (2019:2) argues that the practice of communicating by means of a combination of text and visuals (in a format that we today accept as an infographic) has been employed for centuries. Florence Nightingale (1820-1910) was one of the first notable individuals to use infographics to communicate (Yarbrough 2019:2). In 1859 she published, what she termed a “rose diagram” (Figures 2.7-2.10), to effectively communicate various causes of mortality affecting British soldiers during the Crimean war (Brasseur 2005:161; Yarbrough 2019:2). These first instances of the combination of graphics and text were used to communicate complex information at a distance.

Educators who teach at a distance are tasked with presenting vast quantities of information to distance learners, who often vary in age, level of prior education, and socio-economic background (Yarbrough 2019:3). Online and distance educators should strive to exhibit course content concisely and in various modalities, to better support the diverse

learning needs of their students. (Yarbrough 2019:3) The pervasiveness of infographics forces the instructional designer to consider the importance of including infographics in course design and online learning materials to enrich the educational experience of distance learners (Alyahya 2019:2). Gallagher et al (2017:133) effectively argue that “[t]he online environment often warrants additional and innovative visual materials to support asynchronous learning, of which summary infographics could be a useful addition.”

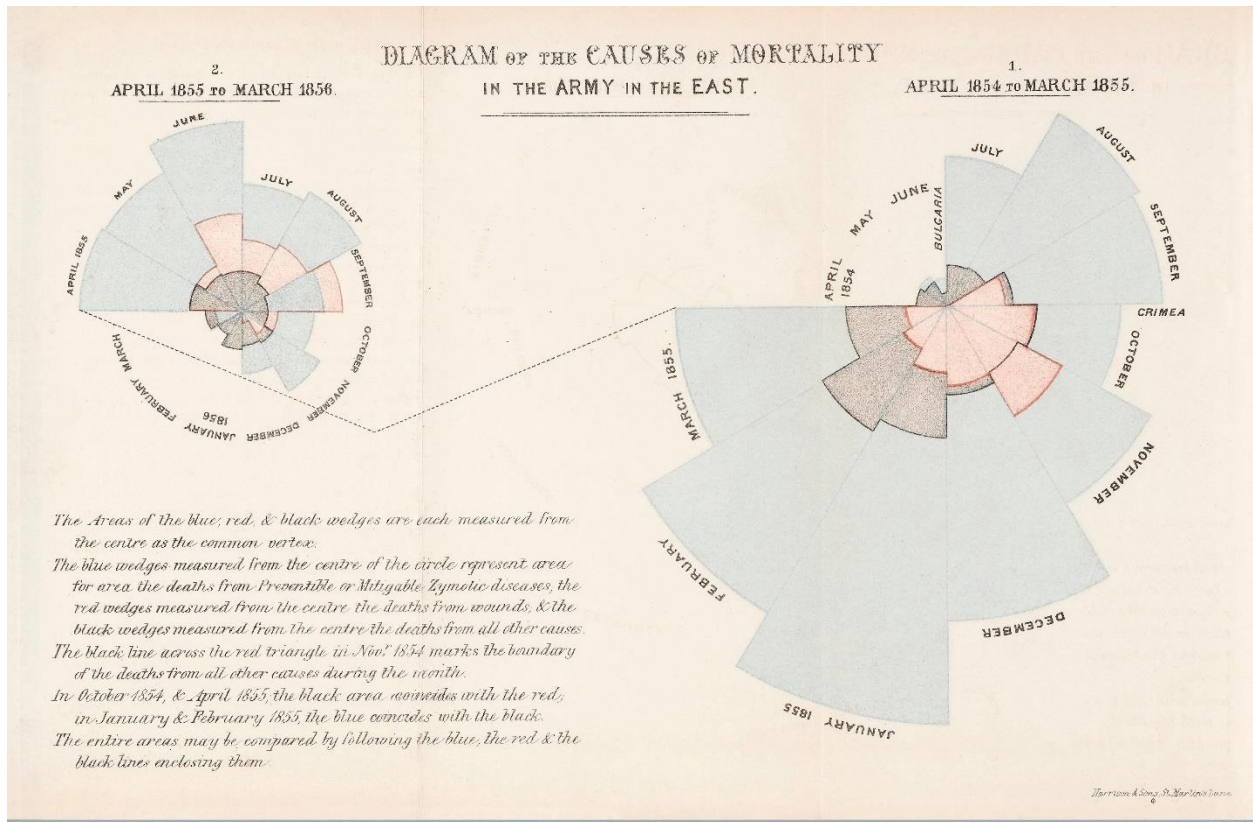


Figure 2.7: Nightingale's rose diagrams (Norman 2021)

The Areas of the blue, red, & black wedges are each measured from the centre as the common vertex.
The blue wedges measured from the centre of the circle represent area for area the deaths from Preventible or Mitigable Zymotic diseases; the red wedges measured from the centre the deaths from wounds; & the black wedges measured from the centre the deaths from all other causes.
The black line across the red triangle in Nov: 1854 marks the boundary of the deaths from all other causes during the month.
In October 1854, & April 1855, the black area coincides with the red; in January & February 1855, the blue coincides with the black.
The entire areas may be compared by following the blue, the red & the black lines enclosing them.

Figure 2.8: Enlarged area of Nightingale's rose diagrams: Narrative text (Norman 2021)

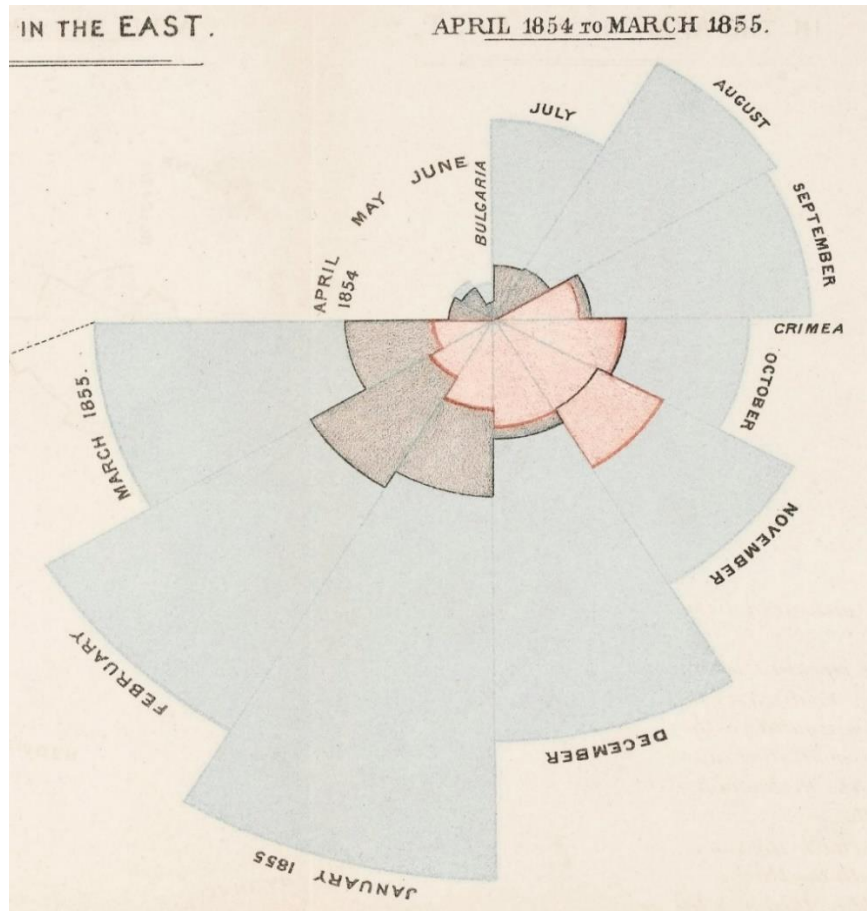


Figure 2.9: Enlarged area of Nightingale's rose diagrams: April 1854 to March 1855 diagram (Norman 2021)

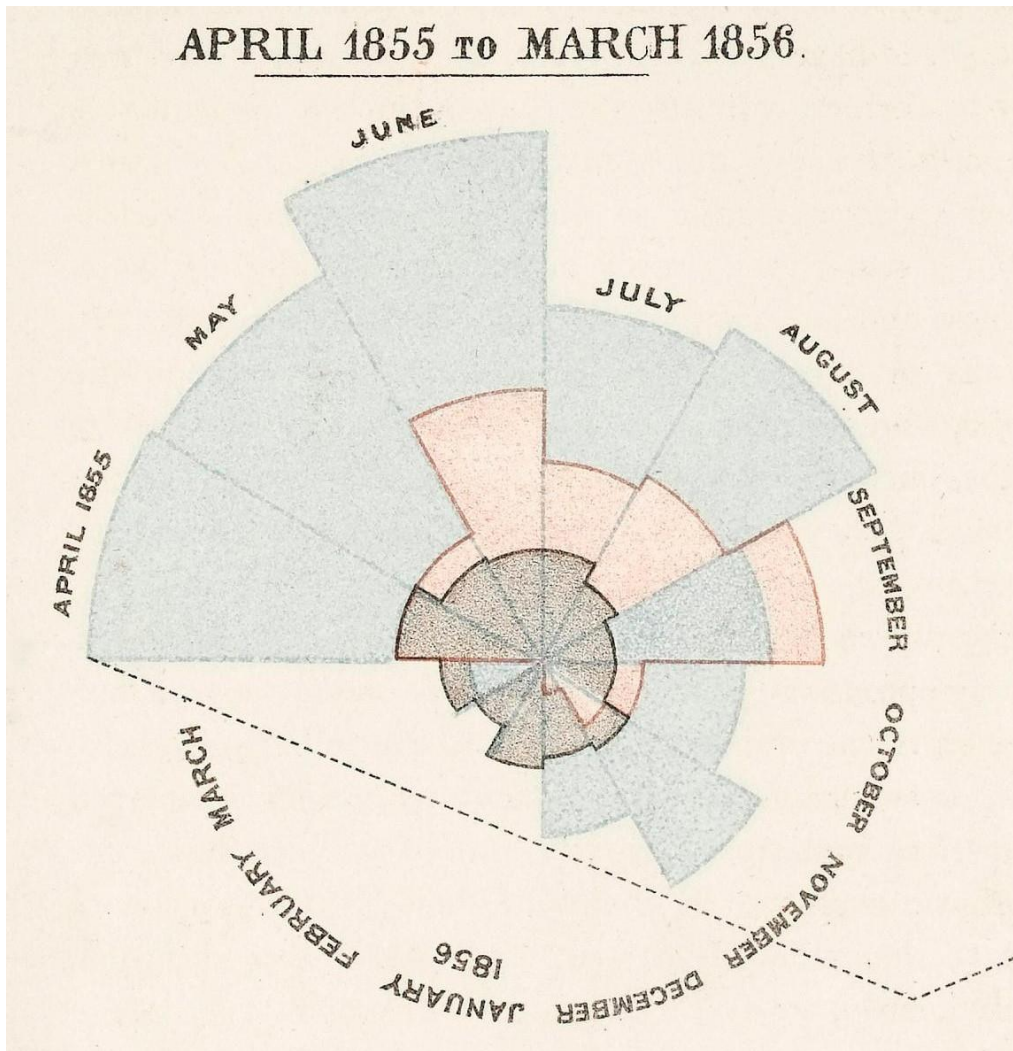


Figure 2.10: Enlarged area of Nightingale's rose diagrams: April 1855 to March 1856 (Norman 2021)

2.6.4 Pedagogy and infographics

Educators must endeavour to produce learning content that is meaningful and supports a vast array of learning needs (Yarbrough 2019:1). They must take cognisance of the infographic as an emerging form of digital communication (Alford 2019:159) and acknowledge that incorporating these in their learning materials will greatly benefit their students. To employ these successfully, lecturers should be sufficiently visually literate

and have been exposed to both reading and creating infographics (Alford 2019:161, 173; Arneson & Offerdahl 2018:1; Bicen & Beheshti 2017:106).

If used effectively, infographics can support student learning with great success. These graphics are aesthetically appealing artefacts used to link new and existing information and stimulate critical thinking (Dunlap & Lowenthal 2016:56). Infographics are highly effective learning tools, because they are visual depictions of relationships between concepts and knowledge and can convey content within a specific context (Dunlap & Lowenthal 2016:56). Therefore, infographics can be used with great success to teach the content of a specific module and may thus be considered as valuable visual learning artefacts in the HE context (Alrwele 2017:105). To ensure their pedagogically sound use, Yarbrough (2019:10) suggests creating infographics that summarise key course concepts, support memorisation, and that utilise pictures in a meaningful way. She also advises educators who plan on including infographics in their learning materials to “strategically construct infographics to maximize communication transfer and minimize space” (Yarbrough 2019:10).

Studies on infographics have illustrated that infographic-based training has had a substantial effect on academic performance and the development of metacognitive skills (Yarbrough 2019:4). Alyahya (2019:1) argues that the use of infographics in learning materials leads to higher levels of understanding and provides students with opportunities to develop their cognitive abilities. This is achieved through the acts of internalisation and interpretation, which also promote independent learning and creativity (Alyahya 2019:1).

A study by Bicen and Behesti (2017) illustrated that stimulating visual communication through the pedagogic use of infographics had “increased the collaboration, engagement and conceptual understanding of learners” (Bicen & Beheshti 2017:102). The purpose of the study was to explore students’ perceptions of infographic as part of the learning process (Bicen & Beheshti 2017:102). Gallagher et al (2017:139) gathered meaningful data on the psychological impact of infographics in education, focussing on students’ perceptions of the appeal of instructor-provided summary infographics, as well as their

impact on retention and comprehension, from open-ended survey questions. The purpose of their open-ended questions was to gather rich data and detailed information on students' perceptions of the value of the infographics used and created in the course (Gallagher et al 2017:134). They found that many students downloaded or printed the infographics and used them at a later stage and outside the online learning environment. This illustrated how infographics are an effective visual learning tool that allows for the “transposition of learning from the online space to the traditional offline space” (Gallagher et al 2017:142).

2.6.5 Instructor-generated infographics

Infographics can be used for instruction in two distinct ways, namely as instructor-generated (or -provided) infographics, or as student-created infographics (Alford 2019:159). As a result, infographics may represent learning material when provided by the educator, an instructional assignment when created by the student, or both. Learning improves when students both view and create visuals (Porter 2018:9-10), so the use of infographics in either modality improves learning.

A novel category of educational infographic, namely the instructor-provided summary infographic, has recently emerged in the literature. These infographics are visual texts provided (and often created) by the lecturer, the purpose of which is to summarise data, information and concepts encountered by the student in a specific area of the coursework. Gallagher et al (2017:132) found that students regarded instructor-provided infographics that summarised course content as valuable learning materials that clarified complex concepts and assisted with the recall thereof. Leopold, Sumfleth and Leutner (2013) (cited in Gallagher et al 2017:132) compared instructor-provided visual summaries and student-generated summaries and surmised that students who were provided with summaries outperformed those who created their own, when their capacity to apply knowledge to new problems was assessed.

2.6.6 Students' views on infographics

Yarbrough (2019:10) states that her extensive literature reviews found that researchers across the globe are concluding that infographics are learners' preferred learning tools, and that these support learning and content retention. Her own quantitative and qualitative findings illustrated that "students self-report perceptions that the infographics contributed value to their learning experience" (Yarbrough 2019:9). She investigated students' perceptions of the educational value of infographics in an online HE course and found that 95 per cent of students regarded infographics as valuable to summarise key concept; 80 per cent found infographics to be helpful when studying for the final exam; and 95 per cent supported the statement that the infographics aided their content retention (Yarbrough 2019:8).

Other researchers have had similar results. Steyn, Botha and Mennega (2018:75) found that 94 per cent of their students regarded infographic as an effective study aid. Bicen and Beheshti (2017:105) found that 82 per cent of students assessed agreed that including infographic in learning materials was useful. Their research also indicated that male and female students regarded infographics as equally effective in motivating them to study the learning material (2017:105). Gallagher et al (2017:134) found that 87 per cent of respondents found that the instructor-provided summary infographics effectively clarified key concepts, and 89 per cent viewed the infographics as useful in helping them memorise and recall key concepts and important aspects of the course content (Gallagher et al 2017:137-138).

After extensive literature reviews (as described in sections 1.2 and 1.4 in Chapter 1) only one study conducted on the use of infographics in HE in South Africa could be found, namely that of Steyn, Botha and Mennega's (2018). This illustrates the need for more studies on the topic conducted within the South African and ODeL contexts.

2.6.7 Future research on infographics

Gallagher et al (2017:133) argue that insufficient research has been done on the use of instructor-provided infographics in online learning environments. Yarbrough (2019:10) further argues that, while there is copious literature on infographics and learning, insufficient studies have been done on the role infographics could play to support online learning in particular. Future research into infographics should investigate the use of infographics as summary tools in a variety of online learning environments, utilising different teaching methods, and within a variety of disciplines (Gallagher et al 2017:143).

One such potential discipline is law. Legal educational could provide a fertile research field in which the pedagogical use of summary infographics, and students' view thereof, could be investigated with great success.

2.7 EVOLVING LEGAL EDUCATION

Ducato (2019:1) states that law is understood as a textual phenomenon. The verbocentrism, or logocentrism, of law has over centuries guaranteed rationality and objectivity since written and spoken words have always been regarded as the most effective way to communicate complex legal discourse and jurisprudence (Boehme-Neßler (2011) in Ducato 2019:1). Porter (2018:8) confirms that, as is the case in virtually all other spheres of life, the legal field is embracing the realm of multimedia, “despite a long tradition of black-and-white stodginess”. Roberts (2019:65) describes the textual nature of the traditional approach to legal education as harmful and pedagogically unsound since legal practice itself has moved on from the purely written and spoken word.

Legal practitioners and judicial officials are beginning to incorporate images into judgments and legal pleadings (Porter 2018:8). Law graduates will be ill-prepared for the emerging multimedia legal culture since traditional legal education provides no hint of this change in legal practice (Porter 2018:8-9). However, legal courses highlighting design, visual and creative skills, focussed on developing students' critical thinking and soft skills,

are starting to emerge in law curricula across the globe (Ducato 2019:5; Colbran & Gilding 2019:6-7).

2.7.1 Legal education in a digital world

The first two years of the Covid-19 pandemic coincided with various developments in online education, online courts and judicial proceedings, and significant progress in predictive analytics and artificial intelligence (Sundquist 2020:3). All these changes have led law lecturers to call into question their outdated views on the purpose of law schools and the future of legal practice (Sundquist 2020:3, 16). The pandemic has resulted in the adoption of emergency remote teaching practices at residential law schools and Sundquist (2020:4) argues that this has already, and will continue to have, a significant and positive impact on legal education. He claims that one of the many benefits of embracing the move to online and distance education practices, is that it prepares students for virtual courtrooms, which he believes are here to stay (2020:4-5, 19).

Technological innovations, specifically in artificial intelligence, predictive analytics, and remote conferencing, are impacting legal practice and the Covid-19 pandemic has accelerated the adoption of these technologies (Sundquist 2020:16). Law schools have a duty to adequately prepare graduates to enter legal practice situated in “the new AI-enabled technological world by considering both curricular change and program development” (Sundquist 2020:19).

Galloway (2017:2) concurs, arguing that legal education should deliver graduates who are fit for purpose, and who can engage with the law within the context in which it functions. She contends that digital literacies should be included in a law school’s curriculum to produce graduates who can work in a legal sphere influenced by digital technologies. Digital visual literacy, one of the core digital literacies, should be developed to accommodate the needs of the workplace (Colbran & Gilding 2019:2; Portewig 2004:37), and in this context that is the law office and the court. Revitalising legal education through the incorporation of visual elements in learning materials, and the

implementation of online teaching practice and sound pedagogy, are ways to coax legal education into the twenty-first century (Selvaras 2019:72; Sundquist 2020:18).

2.7.2 Pedagogy, literacies, and legal education

Porter (2018:9) argues that, when thoughtfully integrated, images are powerful tools for legal education and legal practice. Criticising the use of text-laden PowerPoint slides in formal lectures, scholars explain that our brains struggle to process slides or other forms of content that are purely or overly filled with text (Porter 2018:9; Roberts 2019:74). Including images in slides allows for easier processing of the information contained therein (Roberts 2019:74). Sherwin (2018:55) maintains that law lecturers have a responsibility to develop their students' visual literacy skills. He further explains that visual literacy for the legal profession entails strategic visual thinking and the ability to critically reflect on how a visual artefact creates meaning (2018:55). A study on the views of law students on the curriculum has provided substantial evidence that students regard the development of their visual literacies as crucial to prepare them for the visually rich world in which they will practise (Colbran & Gilding 2019:2). Sassoubre (2018:83) supports this notion and advocates for a standalone course in visual literacy for law students. Supporting the development of these literacies will allow law students, and ultimately law graduates, to continue learning from ever-evolving networks and information sources, highlighting the relevance of the theory of connectivism to visual learning and the need for a more specific focus on the development of visual and digital literacies from law students.

While Sundquist (2020:19) argues that legal pleadings and evidence will most likely be submitted online in the near future, Murry (2018:64) believes that these will also be in the form of multimedia, by saying "visual rhetoric in legal communication may eventually become the norm in legal practice because of the enormous communicative and rhetorical power of visual media".

2.8 CONCLUSION

This chapter aimed to illustrate an understanding of the existing literature on connectivism, visual learning, digital visual literacy, infographics in online HE, and the changing landscape of legal education. The researcher also provided a visualisation of how this theory and these aspects from the literature can be regarded within a single theoretical and conceptual framework. It has become clear that legal education demands the development of students' digital literacies, specifically digital visual literacy, to produce law graduates ready for their profession. This can and should be done by including visuals in online learning materials. Using infographics as visual learning material has additional pedagogic value, apart from transferring crucial concepts and information to students in an easily understood manner. Their interpretation also allows students to develop their visual literacy.

Acknowledging the need to take steps to develop digital visual literacy in law students has implications for law lecturers who wish to utilise visuals, and specifically infographics in digital learning materials. These lecturers must make a conscious and concerted effort to create graphics that communicate effectively and contribute meaningfully to the course material. It is important to investigate how law students perceive the use of infographics, and the educational value thereof, to assist law lecturers in developing students' visual literacy skills, and ultimately to design and implement engaging and pedagogically sound infographics in their course materials. The value of such a pedagogical approach must be analysed within the South African ODeL environment, and within the context of connectivism as a theory of learning.

The next chapter focusses on the research methodology applied in this study. The methodological approach set out here guided the data collection and analysis phases of this study.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter expounded various concepts from existing literature that are relevant to this study. The researcher further sketched a theoretical and conceptual framework and illustrated how these are interrelated. The discussion now continues with the exposition of the methodological approach adopted to facilitate the empirical research conducted for this study. Research methodology may be defined as the procedural framework that guides how research is conducted (Ibrahim 2017:114). The scientific method utilised to solve problems in the pursuit of knowledge involves the rules, principles, approaches, and procedures employed by researchers while engaged in their research activities (De Vos et al 2011:5).

The exposition of the research methodology employed in this quantitative study is preceded by a brief discussion of the value of empirical research in education, with specific reference to this study. To clarify the research methodology of this study, the researcher discusses both the research design and research methods adopted. As part of the study's research design, the research paradigm, research approach, and research strategy, as introduced in Chapter 1, are set out. This is followed by a description of the applicable research methods, which entails a discussion of the population and sample of the study, data collection method, and data analysis approach. The chapter concludes with a discussion of the measures taken to ensure the validity and ethical compliance of the research conducted for this study.

The research design and research methods described in this chapter are all carefully selected and applied to answer the research question pertinent to this study: What are students' views of the pedagogical value of infographics in the online learning materials of the Bachelor of Laws degree at the University of South Africa?

3.2 RATIONALE FOR EMPIRICAL RESEARCH

Menter (2017:4) states that educational research is focused on the study of curriculum, pedagogy, assessment, and management. Tymms (2017:1, 3) argues that educational research has as an overarching goal to improve the educational system by refining how learning occurs and what we learn through analysing, describing, investigating, correlating, problematising, designing, and exploring. Furthermore, there are three general reasons for participating in educational research, namely exploring the issues in question, shaping relevant policy, and improving on existing educational practices (Tymms 2017:6).

Menter (2017:3) provides more detailed reasons for conducting educational research. Firstly, he argues that educational research is driven by accountability, since such research often aims to evaluate how efficiently public funds are spent to ensure that education is in fact done to foster the “social good” it purports to do (Menter 2017:3). Secondly, he describes the professional driver of educational research, which focusses on ensuring that education results in the greatest possible benefit for students and society at large, by attempting to identify opportunities to improve educational practice (Menter 2017:3). Lastly, Menter (2017:3-4) describes the intellectual reasoning behind conducting educational research; the quest for knowledge and educational researchers’ desire for a better understanding of teaching and learning.

As an academic endeavour, educational research is clearly crucial. Anyon (2009, cited in Menter 2017:6) explains that such research must be based on both theoretical understanding and empirically gathered data, since “they imbricate and instantiate one another, forming and informing each other as the inquiry process unfolds”. Rigorous empirical educational studies are thus paramount if educational scholars wish to improve how and what they teach.

This study required that empirical research practices be employed for a variety of reasons. These reasons relate to the knowledge acquired based on the literature review, the data required to answer the research question effectively, and the potential

contribution of the results of this study. As discussed in section 2.6 of Chapter 2, existing research on infographics as visual learning materials proves its value for students. The literature specifically refers to the crucial role infographics can play in the development of digital visual literacy, which is considered essential in today's digital and graphic-laden world (Asimow & Sassoubre 2018:7; Matusiak et al 2019:124; Yarbrough 2019:4). Gallagher et al (2017:143) mention the necessity of conducting research on the use of infographics as summary tools in a variety of online learning environments and various fields of academic study.

Subsequently, valuable data were gathered as a result of the empirical research conducted for this study. The quantitative questionnaire as data collection instrument, by its nature, produced valuable data from students on the pedagogic value of infographics as digital learning materials in the HFL1501 module. The outcome of the study provided insights that both ODeL lecturers and South African law lecturers may find beneficial if they want to develop their teaching practices to incorporate visual learning materials. The study also contributed to the growing body of knowledge on the use and value of (instructor-generated) infographics in online HE. Therefore, there is sound justification for the empirical research conducted for this study.

The purpose of the study encapsulates a variety of Tymms' (2017) and Menter's (2017) reasons for conducting educational research. These include the desires to enhance existing educational practices, to ensure that education outcomes benefit students optimally, and to acquire a better understanding of teaching and learning.

As has also been established in this discussion, the research required to answer the research question and test the hypotheses demanded access to data on students' ability to learn from the instructor-generated infographics, as well as their views on the value of these infographics, which would only be obtained by way of empirical investigation. The research design employed to facilitate the empirical investigation conducted for this study is discussed in the next section.

3.3 RESEARCH DESIGN

Research design refers to the decisions made throughout the course of planning a study. These include decisions on the type of research design to be employed, the procedures necessary for data collection, and choices on data analysis and the measurement of data (Fouché, Delpont & De Vos 2011:143). The epistemology that guides the research, philosophical position informing the relevant methodology, methodology itself, and methods and practices relevant to the research design are all essential aspects to consider when formulating the research design (Harwell 2011:148).

Quantitative research designs may be categorised into two main classes, namely experimental and non-experimental designs (Maree & Pietersen 2016a:166; Fouché, Delpont & De Vos 2011:144). Experimental research designs are employed to answer “cause-and-effect” research questions, which are investigated when a study aims to test (with consecutive tests) whether a specific treatment or intervention has a measurable effect (Maree & Pietersen 2016a:166). Non-experimental designs are most frequently applied in descriptive studies where information on all variables is gathered at one point in time (Maree & Pietersen 2016a:171). The most popular non-experimental quantitative research instrument is that of the questionnaire, which collects data aimed at describing or exploring research topics (Maree & Pietersen 2016a:171). As the purpose of this study was only to describe information gathered from the respondents at a single point in time to develop a base-level understanding of the topic, a non-experimental research design was adopted.

To expound on this non-experimental research design, the rest of this chapter describes the positivist research paradigm and its relevance, the quantitative research approach and the factors considered before adopting it, and the descriptive research strategy and its suitability to the study in question. Figure 3.1 illustrates the research design adopted for this study. Basing this study on the quantitative research design allowed the researcher to study the views of students on the visual learning materials and infographics used in the learning materials of HFL1501. The research design was also crafted to facilitate empirical research that could build on the body of knowledge discussed in the

literature review. Ultimately, this design led to a clear understanding of the subject under investigation and the subsequent results that reflected the respondents' views truthfully and authentically.

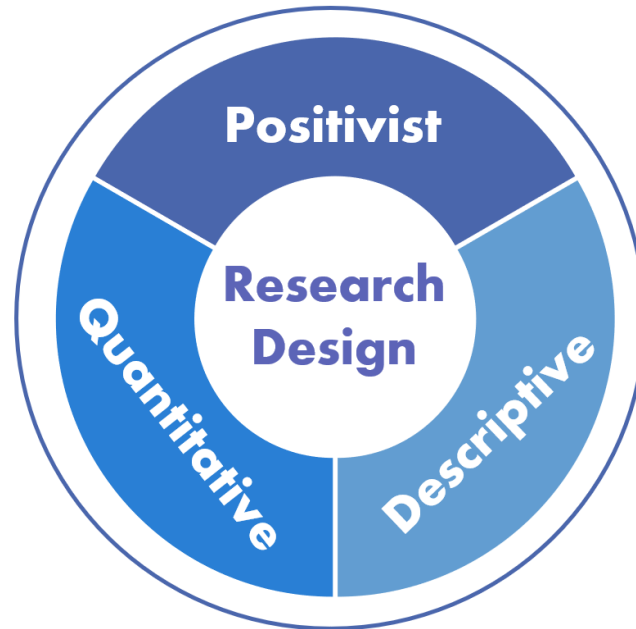


Figure 3.1: Elements of this study's research design

The aspects of the applicable research design are discussed next, starting with the positivist research paradigm.

3.3.1 Research paradigm

Nieuwenhuis (2016:52) describes a paradigm as a system of beliefs about essential features of reality that together gives rise to a specific world view. Delpont, Fouché and Schurink (2011:298) add that these beliefs are rarely questioned or verified empirically. The research paradigm may be considered a design for gathering, understanding, and interpreting data (De Vos & Strydom 2011:40). Scientific research is carried out within a particular research paradigm that demands that the research process and research

materials are considered from a specific vantage point (De Vos & Strydom 2011:41). Kivunja and Kuyini (2017:38) argue that “paradigms as positions about epistemology, ontology and axiology, exert significant influences on the methodology to be used in a research project”. This is true since the methodological consequences of a specific paradigm choice “permeate[s], the research question/s, participants’ selection, data collection instruments and collection procedures, as well as data analysis” (Kivunja & Kuyini 2017:36).

The research paradigm most compatible with the overall research design of this study is that of positivism. Positivism may be described as being based on the philosophical perspective of the natural scientist who busies herself with the observable reality of society, which process ultimately leads to the deduction of generalisations (Helmi Alharahsheh & Pius 2020:41). Put differently, positivism connotes the scientific method of investigation, aimed at interpreting observations as facts or measurable entities before predictions based thereon are made (Boeren 2018:65; Kivunja & Kuyini 2017:30). Positivists assume that objective reality lies outside the boundaries of the personal experiences of the researcher and are, therefore, observable and measurable (De Vos et al 2011:6; Jansen 2016:22). According to De Vos et al (2011:6), “[p]ositivism maintains that it is possible and essential for the researcher to adopt a distant, detached, neutral and non-interactive position”. This position is supported by Kivunja and Kuyini (2017:32), who add that such an approach will ensure that the results “will depend on the nature of the data rather than on [the researcher’s] preferences, personality, beliefs and values”.

The positivist paradigm entails objectivist epistemology, naïve realist ontology, experimental methodology, and beneficence axiology (Kivunja & Kuyini 2017:31). This implies that the application of human reason is required to attain knowledge, the world we wish to investigate is observed and experienced by means of our senses, the research in question will involve the manipulation of variables to measure the effect thereof, and the aim of the research is to benefit the participants and humanity in general by gaining an understanding of the observations made (Kivunja & Kuyini 2017:31). These characteristics of positivistic research relate to the reasoning behind conducting empirical

research in general (Delpont, Fouché & Schurink 2011:298), and in this study, as set out in section 3.2, above. The philosophical approach to research encapsulated in the positivist approach advocates the application of quantitative research methods. This study employed a questionnaire to gather data on students' views on the topic germane to the study. In this manner assumptions are avoided, and scientific results form the basis of the understanding developed on the subject under investigation – in this case students' views on the value of infographics as learning materials.

As Boeren (2018:64) suggests, quantitative research in education is aimed at gathering “static objective data”, which is aligned with the positivist approach to conducting research. Collecting data of this nature for this study allowed for the objective determination of students' views on the use of infographics in the learning materials of HFL1501, therefore suiting the objectives of this study well.

The quantitative research approach, which is aligned with the paradigmatic approach of positivism, is discussed below.

3.3.2 Research approach

Ivankova, Creswell and Plano Clark (2016:307) state that three recognised and accepted approaches to empirical research exist, namely quantitative, qualitative, and mixed methods research. Selecting a specific approach “depends on a researcher's philosophical orientation..., [the] type of knowledge sought... and methods and strategies used to obtain this knowledge” (Ivankova, Creswell & Plano Clark 2016:307). As explained above, the quantitative research approach best suits the positivist paradigm and the aims of this study.

Quantitative research may be defined as “a process that is systematic and objective in its way of using numerical data from only a selected subgroup of a universe (or population) to generalise the results to the universe that is being studied (Maree & Pietersen 2016a:162). The researcher conducting quantitative research derives results from

numerical data by exploring the relationships between variables (Ivankova, Creswell & Plano Clark 2016:307). Boeren (2018:69) argues that gathering facts aimed at observing trends so that they may be quantified, which is the major aim of quantitative research, is referred to as survey research.

Quantitative research methods gather data by means of “predetermined” instruments, like questionnaires, so that the data may ultimately be subjected to statistical analyses (Boeren 2018:66). The role quantitative methods may play in exploratory educational research is explained by Boeren (2018:64):

Although quantitative research is also able to ask about experiences, it is more likely to provide an overview of “what” they are feeling, instead of “why” they are experiencing these feelings, because of the different nature of questions to be answered when using quantitative research approaches, generally more focusing on static objective data instead of subjective meanings.

Both quantitative and qualitative research designs have unique advantages and disadvantages, but “quantitative research seems to provide a better basis for answering pedagogical inquiries and inspecting the effectiveness of pedagogical techniques” (Zaker & Nosratinia 2021:12), which was the aim of this study. Sadly, publications in principal journals on adult education mostly receive submissions that employ qualitative research approaches, implying that quantitative research is regarded as the “methodological underdog” (Boeren 2018:66, 68). Using a combination of a variety of methodological approaches in a single research field may improve the quality of research produced (Boeren 2018:75). By investigating related topics from different methodological angles and collecting both textual and numerical data on a topic, researchers are allowed to develop their understanding of why particular circumstances exist (Boeren 2018:75). The fact that quantitative studies researching pedagogical matters are scarce (Boeren 2018:68), and since the purpose of this study was merely to identify themes and conduct basic exploratory research on the topic, the quantitative design was selected.

This research project employed a descriptive quantitative research study. The data were acquired by means of a questionnaire designed to determine students' views of the value of the visual learning materials and infographics utilised in 2021 in the HFL1501 online learning materials. The questions were also designed to gather information on students' digital visual literacy. To assess the hypotheses, the questions focussed on evaluating students' views on the use of visual elements while engaging with the learning materials, and whether they perceived these visuals as useful in understanding complex concepts. This study also considered variables based on the ages, highest qualifications, and English-language proficiency of respondents, by relating these to their views gathered with the questionnaire. This was done by means of descriptive and inferential statistical analyses, which will be discussed in more detail in sections 3.3.3 and 3.4.3, below. This study, which adopted the quantitative approach, allowed the researcher to describe respondents' views, and present data and results that answered the research question and test the hypotheses. The research strategy applied within this quantitative research approach is discussed next.

3.3.3 Research strategy

The research strategy for the study in question was that of a cross-sectional descriptive study. Descriptive research “presents a picture of the specific details of a situation” (Fouché & De Vos 2011:96), which was helpful in achieving the goal of this research project. The purpose of this study was to obtain a clearer understanding of students' views on the pedagogical value of the infographics used as visual learning materials in the HFL1501 module. This understanding was obtained by employing a descriptive research strategy to present a picture of the respondents' views on the infographics used. Descriptive research demands that the researcher uses a well-defined subject as starting point, and then conducts empirical research to describe the subject as accurately as possible (Fouché & De Vos 2011:96). Descriptive quantitative research involves the exposition of the characteristics of the population in question (Fouché & De Vos 2011:96).

The descriptive study aims to “describe the distribution of one or more variables, without regard to any causal or other hypothesis” (Aggarwal & Ranganathan 2019:34).

A cross-sectional descriptive study requires collecting data on the existence or level of at least one variable of concern as present in a specified population at one particular time (Aggarwal & Ranganathan 2019:35). If the data gathered are analysed purely to verify the distribution of variable(s), the study in question is descriptive in nature (Aggarwal & Ranganathan 2019:35). The advantages of conducting cross-sectional descriptive studies are that they are inexpensive, time-efficient, and straightforward to conduct, and that the ethical considerations regarding their implementation are few (as the study is not duplicated) (Aggarwal & Ranganathan 2019:36).

Two main statistical methodologies exist, namely descriptive and inferential analysis (Kaur, Stoltzfus & Yellapu 2018:60). To analyse and summarise the data collected for a descriptive study, descriptive statistical techniques are utilised (Pietersen & Maree 2016a:204). Descriptive statistics entails the collected data being organised into separate variables, represented by each question in the questionnaire (Pietersen & Maree 2016a:204). This study also made use of inferential statistical techniques to sketch as complete a picture as possible of all the variables of the study, to describe the subject of the study as clearly as possible. A more detailed discussion of the data analysis process and the specific role of descriptive statistics is provided in section 3.4.3, below.

This study regarded the students registered for the HFL1501 module in 2021 as the population. Their views on the use of infographics as visual learning materials were investigated to glean insights into how better to use visual learning materials in online legal education in South Africa. As discussed in sections 1.4, 2.6.4, 2.6.6 and 2.7, research has been conducted on the impact of infographics in the South African HE sector (Steyn, Botha & Mennega 2018), legal education in an ODL context (Selvaras 2019), the value of infographics in developing students’ (digital) visual literacy (Alford 2019; Alyahya 2019; Gallagher et al 2017), and the importance of a specific focus on the development of visual literacy skills in law students (Galloway 2017; Sundquist 2020; Roberts 2019).

However, despite extensive literature searches (as described in sections 1.2 and 1.4), the researcher had not been able to identify any published research on teaching legal history online with the use of infographics as tool to develop visual literacy skills. The cross-sectional descriptive study is therefore well-suited to a study exploring this theme. A basic description of the current position is thus required as a starting point for any research on the topic, justifying the use of the research strategy employed in this study.

This section of Chapter 3 set out the specifics related to the quantitative cross-sectional descriptive study, as informed by the positivist paradigm. An exposition of the practicalities and processes of the research methods necessary to implement the applicable research design follows.

3.4 RESEARCH METHODS

Thus far, this chapter illustrated the necessity of conducting empirical research to answer the research question posed by this study, as well as the research design that informed the empirical research. Outlining the research methods utilised to facilitate this study is essential. To describe the applicable research method, the researcher referred to the population and sampling, data collection method, and data analysis strategy. Figure 3.2 sets out the elements and order of the research methods employed in this study. Thereafter, each aspect thereof is discussed separately.

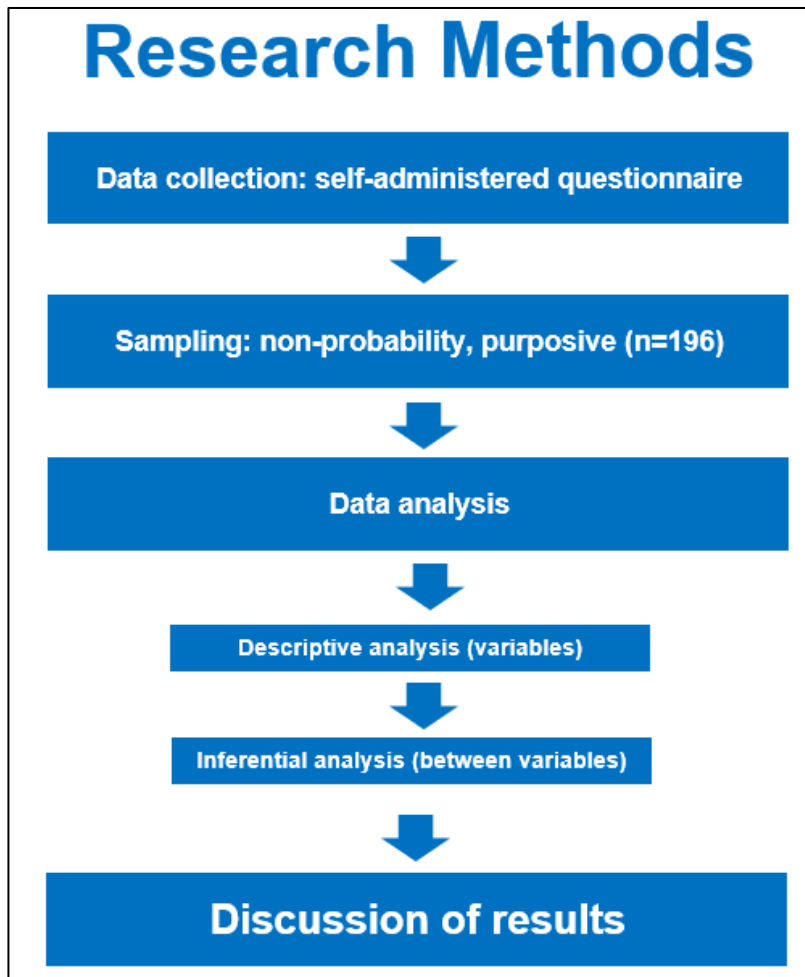


Figure 3.2: Research methods applicable to this study

3.4.1 Data collection

This section discusses data collection instruments and procedures, the questionnaire employed in this study (as well as the type of data collected with it), the development of the questionnaire, and the pilot testing thereof.

Questionnaires are tools used to gather information from persons (Maree & Pietersen 2016a:171). The survey tool employed as data collection instrument in this study was the questionnaire. The chief aim of the questionnaire as research design and data collection instrument is to describe a specific sample by means of gathering information on how

different persons answer the same questions posed to them (Fouché, Delpont & De Vos 2011:156). The questionnaire is simple in design as it “poses a series of questions to willing participants; summarises their responses with percentage, frequency, count or more sophisticated statistical indexes; and then draws inferences about a particular population from the responses of the sample” (Leedy & Ormrod 2005, as cited in Fouché, Delpont & De Vos 2011:156). The questionnaire is the most popular form of non-experimental research design, as no manipulation of the collected data takes place (Maree & Pietersen 2016a:171). Questionnaires may gauge facts, preferences, perceptions, attitudes, opinions, beliefs or prejudices (Fouché, Delpont & De Vos 2011:156).

The following section provides specific details on the data collection instrument utilised in this study, as well as the types of data collected as a result of its implementation.

3.4.1.1 Questionnaire and data collected

The questionnaire consisted of twelve questions. Questions 1 to 3 were multiple-choice questions (MCQs) collecting demographic data on the respondents’ age, English-language proficiency, and highest level of qualification. Questions 4 to 12 gauged the respondents’ views on the use of the visual learning materials and infographics in the HFL1501 module, as well as their ability to benefit from these pedagogically. The latter set of questions related to the research question and hypotheses and consisted of a combination of open- and closed-ended questions. This part of the questionnaire included three MCQs, one question that required of respondents to select items from a list, another to drag and drop the previously selected list-items in a preferred order, and four open-ended fill-in type questions. The questions are provided in Annexure A.

The purpose of including questionnaire questions capturing quantitative data was to collect nominal data that aided in answering the research question and testing the hypotheses. Quantitative questionnaire data is used to “describe and explain the status of phenomena, to trace change and to draw comparisons” (Maree & Pietersen

2016c:174). Maree and Pietersen (2016c:180) argue that the advantages of asking open-ended questions are, inter alia, that participants are afforded the opportunity to provide detailed and honest answers, and participants' thinking processes may be revealed. As proposed by Braun et al (2021:648) the open-ended questions included in the questionnaire were brief, unambiguous, and free of terms or implications that illustrate assumptions on the part of the researcher. By including open-ended questions the researcher could capture rich data from respondents, which provided alternative and more in-depth insights. Some responses to these questions were considered during the data analysis phase to provide anecdotal evidence on students' sentiments towards infographics (see sections 4.3.5 and 4.3.6, in Chapter 4).

The self-administered online questionnaire is a data collection method well-suited to answering the research question of this study. Online questionnaire delivery is the most efficient and popular method, preferred by most researchers today (Braun et al 2021:641). A discussion of how this questionnaire was developed, as well as the research that influenced this process, is provided next.

3.4.1.2 Questionnaire development

The questionnaire was built and administered online with the Qualtrics XM™ software package. Qualtrics XM™ is an online survey tool used by academics for research purposes, and private individuals and companies to conduct market research and other profit- or productivity-driven research projects (Smith 2021:37). Gonzalez (2018:23, 55) describes the Qualtrics XM™ software package as both an application with which an online questionnaire can be built, and a statistical analysis system that can facilitate data analysis and the visualisation thereof.

The process of formulating the questions involved identifying what information would be required to answer the research question and test the hypotheses posed by this study. This was achieved by formulating the questions while considering the research question and hypotheses, both individually and collectively. Specific questions were formulated to

test each hypothesis, ensuring that the data collected by means of the questionnaire would correlate with the research question as posed in section 1.5 of Chapter 1.

The process of developing the questionnaire was also informed by the literature review. While no studies on the use of infographics in online legal education in South Africa could be found, various empirical studies on educational infographics were consulted. The studies in question, which shaped the questions included in the questionnaire employed in this study, include those of Alyahya (2019), Bicen and Beheshti (2017), Gallagher et al (2017), Gonzalez (2018), Steyn, Botha and Mennega (2018), and Yarbrough (2019).

Bielick (2017:11) argues that the general “look and feel” of a questionnaire plays an essential role in how respondents perceive the questionnaire; a good visual impression may likely inspire participation, completion, and thoughtful response to the questions posed. With this in mind, the total number of questions, types of questions selected, their sequence and combination on specific pages of the online questionnaire, and the visual elements included therein were all considered during the development phase. The Qualtrics XM™ tools allows a researcher to preview the questionnaire as it would appear on both computer and mobile device screens. This provided the researcher with the opportunity to edit the formatting of the questions and ensure the logical flow and readability of the questionnaire. This capability of Qualtrics XM™ ensured the creation of a questionnaire that was appealing to the eye, easy to navigate and answer, and short enough to grip respondents’ interest long enough to inspire their completion of the questionnaire. Annexure A provides a visual representation of the questionnaire and contains the questions.

The questionnaire was also pilot tested to assess its ease of use and determine whether it contained any errors. To conclude the discussion on data collection, pilot testing and its applicability to this study is discussed.

3.4.1.3 *Pilot testing*

Piloting the questionnaire was an essential aspect of designing this data collection instrument. Creswell and Hirose (2019:3) explain that when a researcher designs their own data collection instrument, it must be pilot-tested on a few individuals before it is administered. A pilot study may alert the researcher to errors in or weaknesses of the instrument, or whether questions may be misinterpreted (Maree & Pietersen 2016c:174).

Ideally the questionnaire should be piloted by a selection of respondents from the population of the study. However, this was not possible. In response to the impact of the Covid-19 pandemic on both the secondary and tertiary education sectors in South Africa, Unisa put various measures in place to mitigate the challenges posed. Unisa allowed colleges to present modules as year-modules in the 2021 academic year, as opposed to the customary system, which utilises semester modules. This was done to allow students enough time to master the coursework in each module before the summative assessment was completed. Historical Foundations of South African Law was one of the modules presented over the span of the entire academic year. One of the undesirable outcomes of this decision was that students in the College of Law wrote all their examinations at the end of the year, in a significantly longer than normal (three-month) examination period, which was taxing on students. Unisa's Policy for Conducting Research Involving Unisa Employees, Students or Data (Unisa 2016) indicates that studies involving students may not be conducted during the examination period. An exception was made for this study, based on the abnormal nature of the examination period and the undertakings the researcher made in the application to the Research Permission Sub-Committee (RPSC) of the Senate Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC). The applications for clearance to conduct research on Unisa students is discussed in greater detail in section 3.6, below. The implication was that students were to be hindered as little as possible during the examination period and the decision was made not to conduct a pilot study involving them.

The questionnaire was piloted by the researcher's supervisors who are both specialists in HE and ODeL, a group of colleagues (ODeL law lecturers), and relatives who teach at

HE institutions and are familiar with empirical research. One individual indicated that the question which required that she drag and drop her preferred visual learning materials in the order of her preference, did not allow her to do so. No other testers indicated that they experienced this technical challenge, and the decision was made to retain the question. No other feedback indicated that any of the questions needed to be altered or clarified. Both the mobile and desktop versions of the Qualtrics XM™-based questionnaire instrument were piloted.

3.4.2 Selection of respondents

The data collection instrument described above had to be distributed to the respondents to collect the data required to conduct the study. To describe how the respondents were selected, the discussion that follows refers to the population, sample, and sampling methods applicable to this study. The researcher also considered the implications of non-representative data, as relevant to this study.

3.4.2.1 Population and sample of the study

The population of the study consisted of all students registered for HFL1501 in the 2021 academic year (11 444 students). An invitation to participate in the study was sent to all the students in question by means of their official student e-mail accounts. The entire population enrolled for the module was thus granted the opportunity to participate in the study. The target population for the study was identified based on the fact that their knowledge, experiences and views, if collected and analysed, could provide the data required to answer the research question and test the related hypotheses.

The sample was selected according to specific characteristics through non-probability sampling, specifically, the purposive sampling method (Strydom & Delpont 2011:393). Respondents were purposefully selected according to specific inclusion criteria (Maree & Pietersen 2016b:198). For this study, the following inclusion criteria were applied:

- a) The respondents had to be students registered at Unisa in the 2021 academic year.
- b) The respondents had to be registered for the module, HFL1501.
- c) The respondents had to have had access to the module's online learning materials through myUnisa, the institution's LMS.

Upon completion of the data collection period of two weeks, a total of 204 complete responses had been received. Of these, eight respondents had not specifically indicated that they consented to participating in the study. Their responses were thus not recorded. A total of 196 viable responses were received and quantitatively analysed (n=196). The data collection period was limited to two weeks to minimise the hindrance to students who were writing their examinations.

After comparing the population and sample sizes it became evident that the sample was too small. Strydom (2011b:225) contends that the larger the population, the smaller the sample that is required, but in instances where a population consists of 10 000 persons, the sample should comprise at least 450. The sample size of this study is thus non-representative, as it is too small to represent the population. Sivo et al (2006:355) describe inadequate sample size as a sample error, in this case caused by the low response rate. The implication of a sample error is that "generalizing from the sample to the intended population becomes risky" (Sivo et al 2006:352). The next section lays out the effect that the non-representative sample had on this study.

3.4.2.2 The implication of non-representative data

Aggarwal and Ranganathan (2019:36) explain that conclusions drawn from data based on small samples are potentially non-representative, and resultantly unreliable. However, research conducted by Goel, Obeng and Rothschild (2017:16) on opt-in online questionnaires illustrated both "the surprising accuracy of non-representative surveys, as well as ... the surprising inaccuracy of probability-based polls". Since the questionnaire employed in this study was administered online and potential respondents were granted the choice of participating in the study or not, it is comparable to an opt-in online

questionnaire. Goel, Obeng and Rothschild (2017:18) further ask: “Is 2 percentage points of accuracy worth a magnitude or more cost in both time and money?”

The desired degree of accuracy of the results of a study may impact its required sample size (Maree & Pietersen 2016b:199; Strydom 2011b:234). Despite the low response rate of this study, the sample size was still deemed substantial enough to obtain valuable data, although it is not representative of the population. The desired degree of accuracy of the results of this study was impacted by the purpose of the study, as well as its scope. This is because the purpose of the study was not to arrive at generalisable results, but rather to do exploratory research on the use of infographics in the learning materials of law students, which has not been investigated previously (see section 3.4.1). As Boeren (2018:69) suggests, gathering empirical data aimed at identifying trends so that they may be quantified is another major aim of quantitative survey research.

The discussion of the research methods of this study concludes with an exposition of the relevant data analysis procedures and the tools utilised in this regard.

3.4.3 Data analysis

Since data in itself has no meaningful value, extracting meaning therefrom is crucial (Hall 2013:213). To arrive at results that can answer the research question, the raw data obtained from the questionnaire must undergo a process of analysis (Fouché & Bartley 2011:249). This is done through the analysis and interpretation of quantitative data. Data analysis was conducted by means of descriptive and inferential statistics.

Data analysis in quantitative research requires knowledge of a “body of mathematical techniques or processes for gathering, organizing, analyzing, and interpreting numerical data” (Best & Kahn 2006, as cited in Zaker & Nosratinia 2021:14). Two main approaches to statistical methodology relevant to nominal data exist, namely descriptive analysis and inferential analysis (Kaur, Stoltzfus & Yellapu 2018:60). Descriptive statistical analysis is a prerequisite and foundation for inferential statistical analysis, meaning that the former

must be performed on the data first (Kaur, Stoltzfus & Yellapu 2018:60). This is because the initial descriptive analysis supports the process of comparing the variables with inferential statistics (Kaur, Stoltzfus & Yellapu 2018:63). These two types of analyses, and their application in this study, are described below.

3.4.3.1 Descriptive statistics

Descriptive statistics as a data analysis process is utilised to summarise data in a structured and organised way through the process of describing the relationship between variables in the sample or population under investigation (Kaur, Stoltzfus & Yellapu 2018:60). Descriptive statistics refers to various statistical methods that facilitate the organising of data in a meaningful way (Pietersen & Maree 2016a:204). The purpose of descriptive statistics is to condense data into a more manageable and understandable summary, allowing the researcher to recognise certain characteristics of a population (Kaur, Stoltzfus & Yellapu 2018:60).

Descriptive statistics requires that data collected be organised into variables, where each question in the data collection tool represents a separate variable (Pietersen & Maree 2016a:204).

The data collected for this study was analysed and presented by means of frequency distribution, which entails an exposition of “the different response categories of the variable [that] are shown together with the frequency (number) of respondents” (Pietersen & Maree 2016a:204). Examples of these variables are the demographic data of the respondents of this study. All the analysed data were then presented in graphical form, either by means of tabulation or visual representation in a graph. Chapter 4 (sections 4.2 and 4.3) presents these descriptive statistical analyses, as conducted on the data gathered for this study. Here the variables are shown by frequency and represented visually to aid the interpretation thereof. After descriptive statistical analysis was completed, certain variables were selected to compare and relate to one another by

means of inferential statistical analysis. A discussion of these variables, along with a description of the results are provided in section 4.3, in Chapter 4.

3.4.3.2 Inferential statistics

The aim of inferential statistics is to support the process of drawing conclusions (making inferences) based on the data and to learn more about the sample (Pietersen & Maree 2016c:220). The procedure of cross-tabulation, a form of inferential statistical analysis, was applied in this study to certain variables with nominal values. Cross-tabulation may be described as a two-way frequency table that evaluates two variables at the same time, allowing the researcher to investigate response patterns for different sub-groups of respondents (Pietersen & Maree 2016a:205). This means that inferences may be made regarding the relationship between different variables. An example of how inferential statistical analysis was applied in this study was to compare respondents' highest qualifications with their perceived ability to understand the infographics used in the course material of the HFL1501 module (see section 4.3.4, in Chapter 4).

Where cross-tabulations were calculated, the statistical significance of the results were tested by means of the chi-square or Fisher's exact tests. These tests are used to determine whether variables are independent of one another, or whether there is any significant relationship between them (Pietersen & Maree 2016d:275). These tests are discussed in more detail in section 3.4.3.3(b), below.

The two types of data analysis applied in this study has been set out and their application justified. The discussion that follows explains the technicalities of these analyses, as well as the software used to facilitate the data analysis required to conduct this study.

3.4.3.3 Statistical processing software packages and relevant procedures

The statistical analysis required before the interpretation of the results was performed by means of two software packages. These software packages, and the relevant procedures, are now set out.

a) Qualtrics XM™

The Qualtrics XM™ software package, with which the data collection tool was built, captured all the data provided by the respondents in this study. This software package was also used in this study to facilitate the calculation of the frequency of the variables within the dataset (the descriptive statistical analysis, as set out in 3.4.3.1 above). Qualtrics XM™ also allowed the researcher to create visual representations of the statistically analysed data. The researcher used these Qualtrics XM™ tools to create graphs to visually represent the data gathered on the various variables. These are included with the discussion of the results in the chapter that follows.

b) IBM® SPSS® Statistics

The Qualtrics XM™ software package license available to the researcher did not allow for the analysis of data by means of cross-tabulation. As a result, another software package was used to complete the inferential statistical analyses. The complete dataset was downloaded from Qualtrics XM™ in statistical document format, to allow for the upload thereof onto the IBM® SPSS® Statistics software package (SPSS). Cross-tabulation of certain variables was performed with SPSS. This software package was also used to conduct chi-square and Fisher exact tests on the cross-tabulated data, to determine the statistical significance of the results. In some instances, the data used for cross-tabulation had to be recoded to allow for the facilitation of these tests. Recoding quantitative variables to categorical variables decreases the number of subgroups of data relevant to a single variable, allowing the researcher to use the newly coded data to correlate data with other variables to facilitate hypothesis testing (Subedi 2016). In this study, the relevant variables were recoded with the SPSS software package to allow chi-square or Fisher's exact tests to be conducted on the data. An example of the recoding required was reducing the data on the age categories of the respondents from four categories to two (see section 4.2.1.1, in Chapter 4).

Chi-square or Fisher's exact tests are non-parametric tests used to determine the statistical significance of results based on the cross-tabulation of data on two nominal variables (Pietersen & Maree 2016d:275). The two hypothesis statements applicable to these tests are:

"H₀: the variables are independent (or there is no statistically significant association between the variables)

H₁: the variables are dependent (or there is a statistically significant association between the variables)" (Pietersen & Maree 2016d:275-276).

The chi-square test determines whether the null hypothesis may be accepted based on the data in the cross-tabulation by producing a *p*-value (Pietersen & Maree 2016d:276). If the *p*-value is less than 0.05, the null hypothesis may be accepted, indicating that there is no statistically significant relationship between the variables (Pietersen & Maree 2016d:276-277). Fisher's exact test is used to test the same null hypotheses and is based on the same principle, but it is used when any cell in the cross-tabulation table has a value of less than five, in which case the chi-square test is not valid (Pietersen & Maree 2016d:277). Where the inferential statistical analyses are discussed in detail in Chapter 4 (see section 4.3), either the chi-square test or the Fisher exact test was conducted in each instance to determine the statistical significance of the results.

The discussion of the applied data analyses processes concludes the exposition of the research methods adopted for this study. The discussion continues with a description of the measures taken to ensure the validity of the research conducted.

3.5 VALIDITY AND RELIABILITY

When formulating a standardised measuring instrument, such as a questionnaire, the reliability and validity thereof must be determined (Pietersen & Maree 2016b:238). Validity refers to how effective a data collection instrument is at measuring what it is intended to measure (Pietersen & Maree 2016b:239). Reliability concerns ensuring the consistency of results when the same instrument is administered multiple times (Pietersen & Maree

2016b:238). Different guidelines for determining the validity and reliability apply to experimental and non-experimental quantitative research designs.

Experimental designs have strict requirements regarding the validity and reliability of the research design, as the aim is to determine cause and effect and, therefore, these studies are often duplicated (Maree & Pietersen 2016a:166). Since this study was facilitated by means of a non-experimental design in which the questionnaire was only administered once, it was not necessary to determine the reliability of the data collection instrument.

This discussion continues by focussing on the aspect of validity. As explained earlier, the validity of a data collection instrument concerns “the adequacy of the developed test for sampling the universe of knowledge and skills which is being inspected” (Zaker & Nosratinia 2021:18). It is of paramount importance that researchers are aware of the potential threats to research validity (Zaker & Nosratinia 2021:13). Four types of validity may be investigated, namely face, content, construct, and criterion validity (Maree & Pietersen 2016a:166). Face validity and content validity are the only types of validity applicable to this study, due to the nature thereof and the type of questions contained in the questionnaire. The applicable validity criteria will now be discussed within the context of this study.

3.5.1 Face validity

This type of validity concerns “the extent to which an instrument ‘looks’ valid” (Pietersen & Maree 2016b:240). Put differently: On the face of it, does the instrument appear to measure what it is intended to? This is a subjective measure that cannot be tested conclusively, and therefore experts’ advice must be gathered to enquire about this type of validity. In this study the researcher relied on her supervisors’ ODeL expertise and experience in determining whether the instrument embodied face validity. They did not express any concerns in this regard.

Face validity also concerns what the instrument looks like physically when presented to the respondent. Dörnyei (2010, as cited in Zaker & Nosratinia 2021:18) argues that:

producing an attractive and professional design is half the battle in eliciting reliable and valid data. A properly designed questionnaire which looks nice to the eyes convinces respondents to spend time and effort on responding a questionnaire.

Annexure A provides a visual representation of what the questionnaire looked like onscreen. The researcher took care to ensure that both the desktop and mobile device versions of the questionnaire were neat and easy to understand.

3.5.2 Content validity

Content validity concerns the extent to which an instrument comprehensively covers the content of the construct it is designed to measure (Pietersen & Maree 2016b:240). At issue is the varying meanings that may be attributed to a particular concept or construct (Delpont & Roestenburg 2011:173). To determine the presence, or not, of such validity in a specific instrument one could ask “Is the instrument really measuring the concept we assume it is? [and] Does the instrument provide an adequate sample of items that represent the concept being measured?” (Delpont & Roestenburg 2011:173). Expert opinion is again sought to make this subjective finding (Pietersen & Maree 2016b:240). Again, the researcher’s supervisors did not raise any concerns related to the validity of the instrument.

Boeren (2018:69) argues that “borrowing questions that have been used before will increase the validity and reliability of your results”. The questionnaire that facilitated the data collection process in this study included questions previously employed in studies by Bicen and Beheshti (2017) and Gallagher et al (2017). This improved the content validity of this study as these questions’ validity and reliability had been scrutinised and proven before (Bicen & Beheshti 2017:104; Gallagher et al 2017:135). An additional layer of validity and reliability may be applicable to a study if the data collection instrument has been pilot tested (Boeren 2018:69). The pilot testing phase of this questionnaire has been

discussed in section 3.4.1. This discussion illustrates that ample consideration was given to the aspect of content validity throughout the drafting process of this questionnaire.

One of the chief advantages of centring a research study within the positivist research paradigm is that it compels the researcher to remain objective and, resultantly, the validity of the knowledge acquired remains intact and unaffected (De Vos et al 2011:6). This discussion has illustrated that the researcher had taken care to ensure the face and content validity of the questionnaire utilised in this study. The purpose of these steps and considerations were all in service of ultimately reaching results that reflected the views of the respondents who make up the sample truly. To further illustrate the adherence to standards for empirical research, as set by the academic community, the following discussion focusses on the ethical considerations adhered to in order to conduct sound, valid and safe research.

3.6 ETHICAL MEASURES

When research involving humans is conducted, it is crucial to consider the ethical guidelines intended to protect these respondents against harm, and their human dignity and fundamental rights must be at the heart of the researcher's consideration (Zaker & Nosratinia 2021:14). To conduct this study in line with the ethical standards for research involving human participants and Unisa students as set out by the institution, the researcher applied for permission from two Unisa bodies. The College of Education Research Ethics Committee granted permission to conduct research for the purposes of this study. The reference number for this clearance certificate is 2021/09/08/58549900/16/AM (Annexure B). The Research Permission Sub-Committee (RPSC) of the Senate Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC) also granted permission to conduct research using Unisa students as respondents. The reference number for this clearance certificate is 2021_RPSC_089 (Annexure C).

Both applications to conduct this research considered the cover letter to the questionnaire, sent to all prospective respondents as the invitation to participate in the study. This letter (Annexure D) informed the respondents of the purpose of the study, that their submissions would be anonymous, and stored securely. Respondents were also notified that they were free to withdraw from the study at any time prior to submitting their responses. The first question of the questionnaire also requested that respondents indicate that they understood the purpose of the research and that they were providing their informed consent to participate therein.

The Qualtrics XM™ software collects all answers provided, regardless of whether the respondents complete the questionnaire and click on the “submit” button after the last question. To adhere to the undertaking that students may withdraw from the study at any time, all incomplete submissions that were not finalised by clicking on “submit”, were regarded as withdrawals from the study and were not included in the sample for analysis.

Additional ethical measures relevant to the study, as influenced by legislation, also dictated that the researcher had to take special care with the personal information of the respondents. In terms of section 1 of the Protection of Personal Information Act 4 of 2013 (the POPI Act), the e-mail address of an identifiable, living, natural person qualifies as personal information. To distribute the invitation and hyperlink to the online questionnaire to the prospective respondents, this information had to be sent via their student e-mail accounts. Unisa put in place safety measures to protect both researchers and their respondents, as intended by the Act. To adhere to these requirements the researcher requested Unisa’s ICT Directorate to disseminate the questionnaire to the prospective respondents on her behalf, thereby prohibiting the researcher access to the respondents’ e-mail addresses.

3.7 SUMMARY

This chapter provided a rationale for the necessity of research on infographics as online visual learning materials in HE. The researcher also explained why conducting empirical

research was required to ensure the valid results necessary to answer the research question of this study.

The researcher specified the research design of the study by describing the positivist research paradigm and its relevance to this study, the quantitative research approach and the reasons for its adoption, and the descriptive research strategy and its suitability to the study in question. This chapter also contains an exposition of the research methods adopted to conduct the research necessary to facilitate this descriptive quantitative study as described. An online self-administered quantitative survey was the appropriate data collection tool to collect the respondents' demographic data and their answers to questions directly related to the purpose of the study. This type of survey and its suitability to the study was discussed, as well as the target population, inclusion criteria, sample, and non-probability sampling method used to determine the data to be analysed. The researcher further provided justification for the value of the knowledge gained from the data analyses conducted for this study, in spite of the fact that the sample does not represent the population and the results are not generalisable. The quantitative data analysis strategies of descriptive and inferential statistics were described in detail and correlated to the purpose and design of this study.

The researcher discussed the procedures considered to ensure the validity of the data collection instrument and the quantitative data. The chapter culminates in a discussion of the ethical aspects applicable to this study, as well as the measures taken to ensure adherence thereto.

Chapter 4 discusses the results based on the empirical research conducted for this study. The steps taken to reach these results were guided by the methodological approaches set out in this chapter.

CHAPTER 4 RESULTS AND DISCUSSION OF EMPIRICAL RESEARCH

4.1 INTRODUCTION

The previous chapter presented the research methodology employed in this study and described the relevant data collection and analysis processes. In this chapter the researcher presents the results of the study based on the analysis of the data gathered to answer the research question. This discussion is structured in a manner that allows for the analysis of each research sub-question and testing and accepting or rejecting each research hypothesis. Answers to these sub-questions will ultimately assist in answering the research question: What are students' views of the pedagogical value of infographics in the online learning materials of the Bachelor of Laws degree at the University of South Africa? The nine sub-research questions and relevant hypotheses are provided in 1.5.

The discussion that follows evaluates the analysed data gathered from the questionnaire using a positivist perspective, and within the confines set out by a quantitative research method and non-experimental design. Since this study is descriptive in nature and aimed at exploring the research topic, the data gathered is described. Only thereafter may conclusions be drawn based on the analysed data. The demographic information is discussed first, whereafter the results are sketched. To validate the results, a literature control will be included throughout to demonstrate how the data relates to previous research findings and results.

The three demographic questions provided a demographic profile of the respondents, which is discussed alongside the results. The results are presented visually in the form of tables and graphs. The consolidated results are discussed alongside each research sub-question. Thereafter the results are related to the theoretical framework and presented before the conclusion of this chapter. The questionnaire questions under analysis in this chapter are provided in Annexure A.

4.2 BIOGRAPHICAL PROFILE OF RESPONDENTS

The discussion of the study's results, based on the data obtained from the responses of all 196 respondents, starts off with an exposition of their biographical information. The researcher regarded it as important to understand more about the respondents before analysing their responses to the questionnaire. The biographical profiles of respondents in this study consisted of information gathered about their age, English-language proficiency, and highest qualifications. Before these biographical characteristics are discussed, it is prudent to consider the value or not of collecting data on the respondents' gender.

Bicen and Beheshti (2017:105) found that respondents' gender had no significant effect on whether or not they regarded infographics in the learning material as having a motivating effect in their study processes. Furthermore, Heilmann (2021:180) and Braun et al (2021:647) contend that social researchers who are not focussed on or informed in the intricacies of gender identity may unknowingly offend or discriminate against respondents. To avoid inadvertently offending the respondents the researcher decided against collecting data on gender identity.

4.2.1 Age of respondents

In Table 4.1 the respondents' ages are set out in categories. Based on Mannheim's theory of social generations (1928 as cited in Roberts 2018:275), the generational divisions of the age categories as defined by Barhate and Dirani (2021:139) are also provided. In this context, a 'generation' connotes a classification of persons, based on their close age, who are considered to have corresponding general characteristics regarded as typical of a certain period (Bozark 2021:115).

Table 4.1: Age distribution of respondents

Age Category	Generation	Frequency	Percentage
18-24	Generation Z	76	38.77%
25-40	Millennials	96	48.97%
41-56	Generation X	20	10.20%
Older than 57	Baby Boomers / Silent Generation	4	2.04%
Total		n=196	99.98%⁷

The largest age category represented in the study is that of Millennials, aged 25 to 40 years, making up nearly half of the sample population (48.97 per cent), followed by 38.77 per cent of the respondents, aged 18 to 24, making up the Generation Z-segment of the sample population. Generation X consisted of 20 respondents (10.2 per cent) aged between 41 and 56. Only 2 per cent of the respondents were older than 57 years of age, categorising them as either Baby Boomers or being of the Silent Generation.

4.2.2 English-language proficiency of respondents

The pie chart in Figure 4.1 represents the English-language proficiency of respondents visually. More than three-quarters of the respondents (77.55 per cent (n=152)) speak English as a second language, 19.39 per cent of the respondents (n=38) were first-language speakers and 3.06 per cent (n=5) spoke English as a third, fourth or fifth language.

⁷ Due to the rounding of figures to the second decimal point, the totals indicated in Tables 4.1, 4.12, and 4.17 do not equal 100. This was kept as is, for the sake of mathematical accuracy.

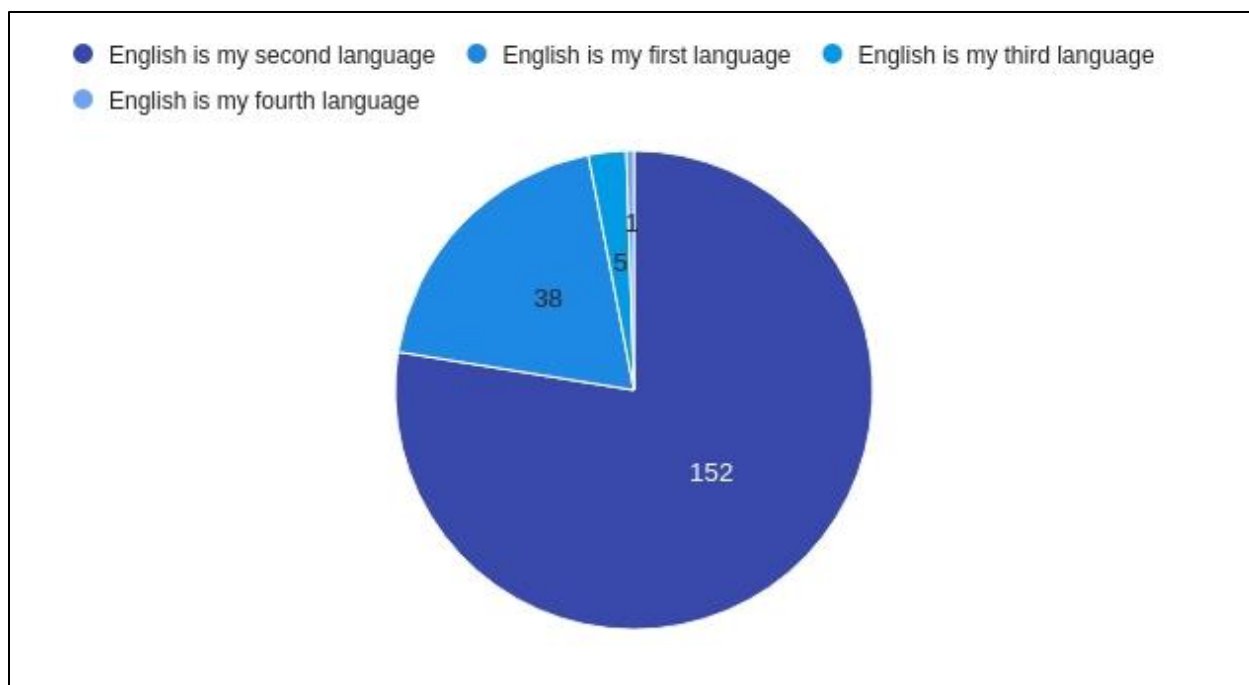


Figure 4.1: Pie chart indicating respondents' English-language proficiency (n=196)

4.2.3 Highest qualification of respondents

Figure 4.2 represents respondents' highest qualifications. Nearly half (47.45 per cent (n=93)) of those students who participated in the study indicated matric as being their highest qualification. 25 and 45 respondents respectively completed diplomas and certificates, in total making up 35.71 per cent of the population. 16.48 per cent of respondents (n=33) had completed degree qualifications, and of these six had completed post-graduate qualifications (five master's degrees and one doctorate). Most of the respondents were thus novice HE students or enrolled for their first degree qualification.

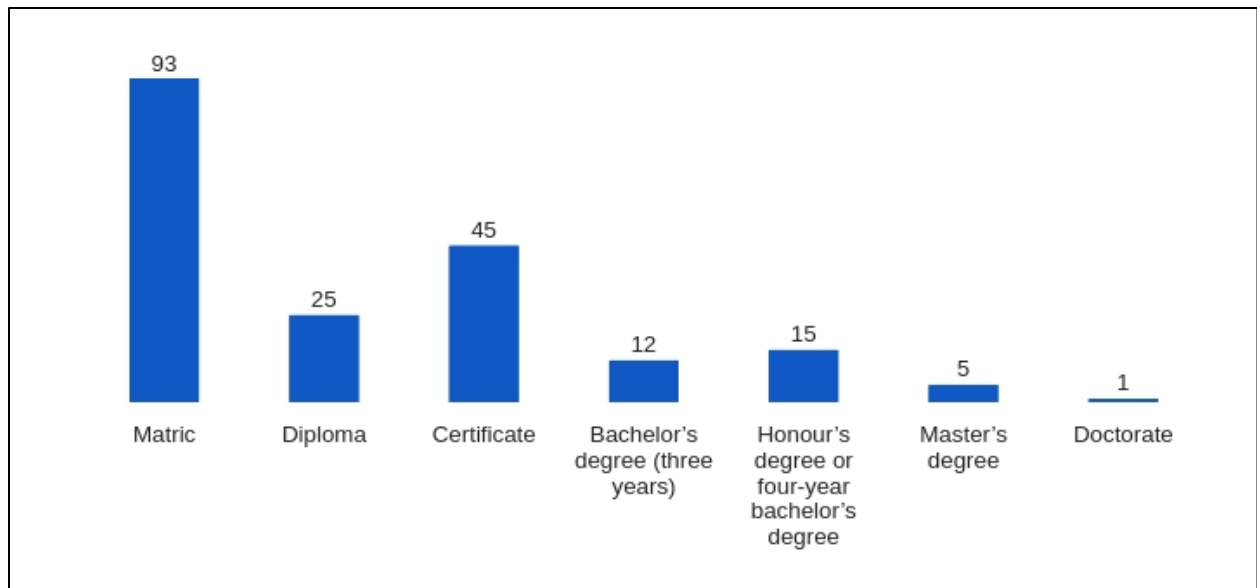


Figure 4.2: Bar chart of respondents' highest qualifications (n=196)

In the next part of this chapter, the researcher continued the discussion by setting out the results of the study, based on the data gathered from the responses to the questionnaire that related to infographics and visual learning.

4.3 RESULTS ON RESPONDENTS' VIEWS ON THE VALUE OF INFOGRAPHICS AND VISUAL LEARNING MATERIALS

This discussion is divided into sections, by discussing the responses to each question individually. The researcher also provides visual representations of the responses received in the form of graphs and tables. These results are based on descriptive statistical analysis, and more specifically the frequency of responses in terms of each variable. The researcher related the results discussed here to previously published research. Thereafter, several variables are related to each other to draw inferences based on the data. This is done by means of cross-tabulation of the data to identify relationships, if any, between various variables and certain demographic data, as discussed in the previous section. Where cross-tabulations of the data were conducted, the statistical

significance, or not, of the relationship between the variables was tested with either the chi-square or Fischer exact tests. These processes are discussed in more detail in section 3.4.3.3, in Chapter 3 and the results of these tests are considered more specifically in section 4.4, below. This discussion of the results starts with an exposition of the data on the visual learning materials the respondents' found to be most beneficial.

4.3.1 Respondents' views of the most beneficial visual learning materials

Respondents were asked two questions on their views on the most beneficial online visual learning materials used in Historical Foundations of South African Law. Responses to these questions were first evaluated separately, whereafter they were considered in parallel.

4.3.1.1 *The visual learning materials regarded as valuable*

Respondents were asked to consider their experience of studying the HFL1501 course material and asked to indicate which visual learning elements they found to be most beneficial in aiding their understanding of the course content. Table 4.2 sets out the options respondents had to select from when indicating which materials they found useful. These options encapsulated all the visual learning materials used in the online learning material in this module. This table also indicates the frequency with which a specific visual learning material was selected as useful.

Table 4.2: Visual learning materials perceived as useful by respondents

Response	Frequency	Percentage
Infographics	114	58.16%
Live lectures or video recordings thereof	110	56.12%
Still images, such as photos or illustrations	105	53.57%
Diagrams	95	48.47%
Tables	75	38.27%

External video content, for example YouTube videos	64	32.65%
Humorous visuals, such as memes or cartoons	40	20.41%
Total responses	603	
Total respondents	n=196	

Infographics were regarded to be useful by the largest number of respondents (58.16 per cent), but video material of live lectures or their recordings ranked very closely, with 56.12 per cent of respondents regarding them as useful. Many respondents also indicated that they found still images (53.57 per cent) and diagrams (48.47 per cent) to be of value. Tables, external video content (such as YouTube videos), and humorous visuals (memes or cartoons), were not favoured as significantly. These were only regarded as useful by 38.27 per cent, 32.65 per cent, and 20.41 per cent of respondents, respectively.

The results evident from this question correlate with those of Yarbrough (2019:9-10), that are based on both extensive literature reviews and her own empirical results. She found that infographics are learners' preferred visual learning materials (Yarbrough 2019:10). These results are also supported by those of Steyn, Botha and Mennega (2018:75) and Bicen and Beheshti (2017:105).

The next question under analysis required of respondents to rank the visual learning materials they had selected.

4.3.1.2 Preferred order of visual learning materials

Respondents had to indicate their order of preference for the visual learning materials they had selected in the previous question. Table 4.3 indicates the orders in which respondents ranked the module's visual learning materials. 18.37 per cent of respondents (n=36) regarded the lectures as the most useful visual material available to them, while only 15.3 per cent (n=30) regarded the infographics to be their most preferred visual learning material. Still images were regarded the third most-preferred visual learning material, which correlates with the data depicted in Table 4.2 above. Significantly fewer

respondents regarded tables, diagrams, external video content, or humorous visuals as beneficial, and therefore fewer respondents regarded these as their most preferred visual learning materials.

Table 4.3: Respondents' ranking of visual learning materials in order of preference

Visual learning materials	1st choice	2nd choice	3rd choice	4th choice	5th choice	6th choice	7th choice
Live lectures or video recordings thereof	36	15	12	4	6	6	1
Infographics	30	22	19	9	2	2	0
Still images, such as photos or illustrations	19	17	18	14	5	0	0
Tables	12	18	10	12	5	1	0
Diagrams	9	21	19	13	7	1	0
External video content, for example YouTube videos	5	15	7	9	12	3	1
Humorous visuals, such as memes or cartoons	5	1	4	5	8	5	5

The line chart provided in Figure 4.3 is based on the data in Table 4.3 and illustrates how significantly respondents favoured the three most popular visuals (lectures, infographics and still images). The line chart illustrates that, if a student selected the lectures, infographics or still images as being of value, they were significantly more likely to rank these as most valuable.

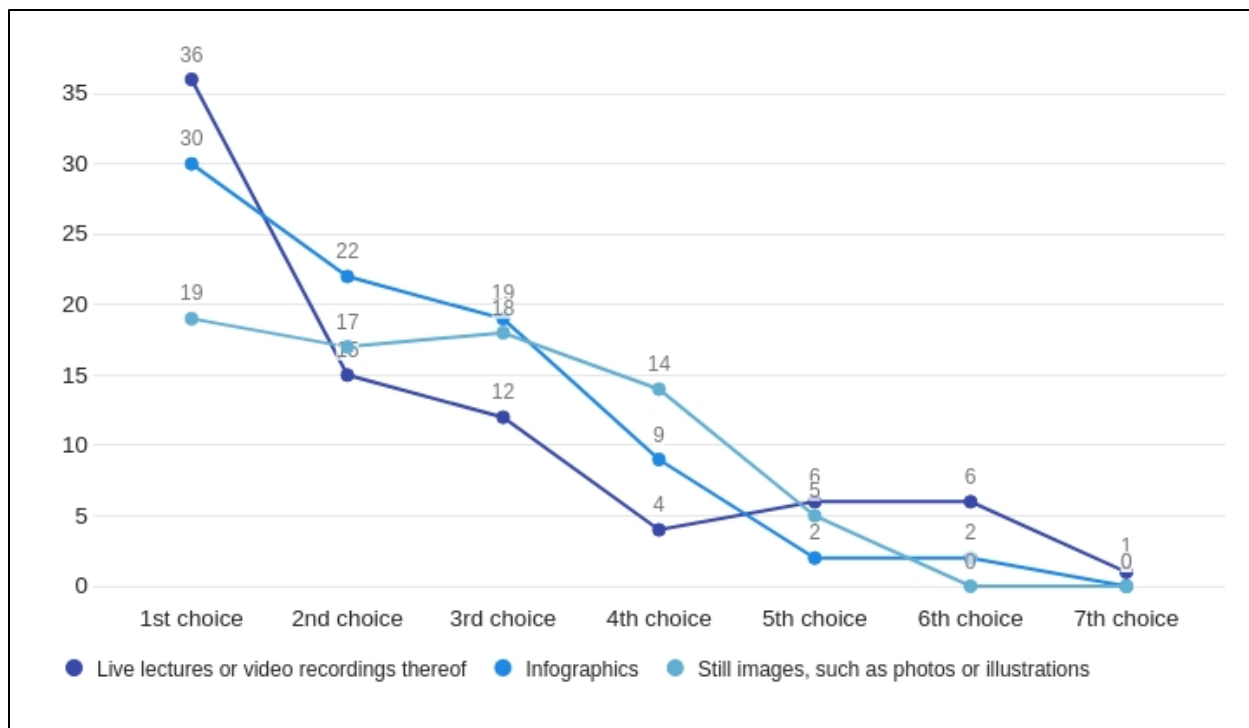


Figure 4.3: Line chart of respondents' first three preferences for visual learning materials

When the results based on the two questions on respondents' preferred visual learning materials are considered together, it is clear that while infographics were the most popular visual learning material (most frequently selected by respondents as valuable), they were not respondents' most preferred visual learning material. Students regarded the video lectures (live or recorded) as being their most preferred visual learning material employed in the course. This might be because video, as multimedia, employs both audio and visual elements, conveying information more effectively by communicating through both visual and audio "channels", which allows two separate areas of the brain to process the information received (Mayer 2001:11; Mayer 2019:154).⁸ Of the still visual learning

⁸ The great (instructional) media debate between Clark (1983; 1994; 2001) and Kozma (1991; 1994) falls beyond the ambit of this study. The purpose here is not to investigate the pedagogical value of various educational media, but merely respondents' perceptions of the value of infographics as an example thereof.

materials provided in this course, infographics were the most popular, and most respondents regarded these as their first choice.

What is evident from the demographic data of the respondents (as discussed in section 4.2, above) is that they make up a varying group, as is the case with most groups of ODeL students. Yarbrough (2019:3) states that these students often differ in age, degree of prior education, and socio-economic background. As a result, they have disparate learning needs and preferences, and providing course content by means of various approaches is one way of catering for these divergent learning needs (Yarbrough 2019:3). The results discussed in this section support Yarbrough's (2019:3) results and indicate that respondents' preferences for specific types of visual learning materials differ. It is therefore important to include various types of visual learning materials, to support the learning of as many students as possible.

The next variable under consideration concerns students' preference for more visual learning materials in the LLB degree programme.

4.3.2 Respondents' desire to see more visual learning materials

The respondents were asked whether they would appreciate more visual learning materials in their other LLB modules. Figure 4.4 presents the data gathered from the responses to this question in a pie chart. A resounding 93.88 per cent of respondents (n=184) indicated that they would appreciate the inclusion of more visual learning materials. This is a highly significant finding. For a deeper analysis of the data, this variable will be evaluated against two others, namely the ages and English-language proficiency of the respondents.

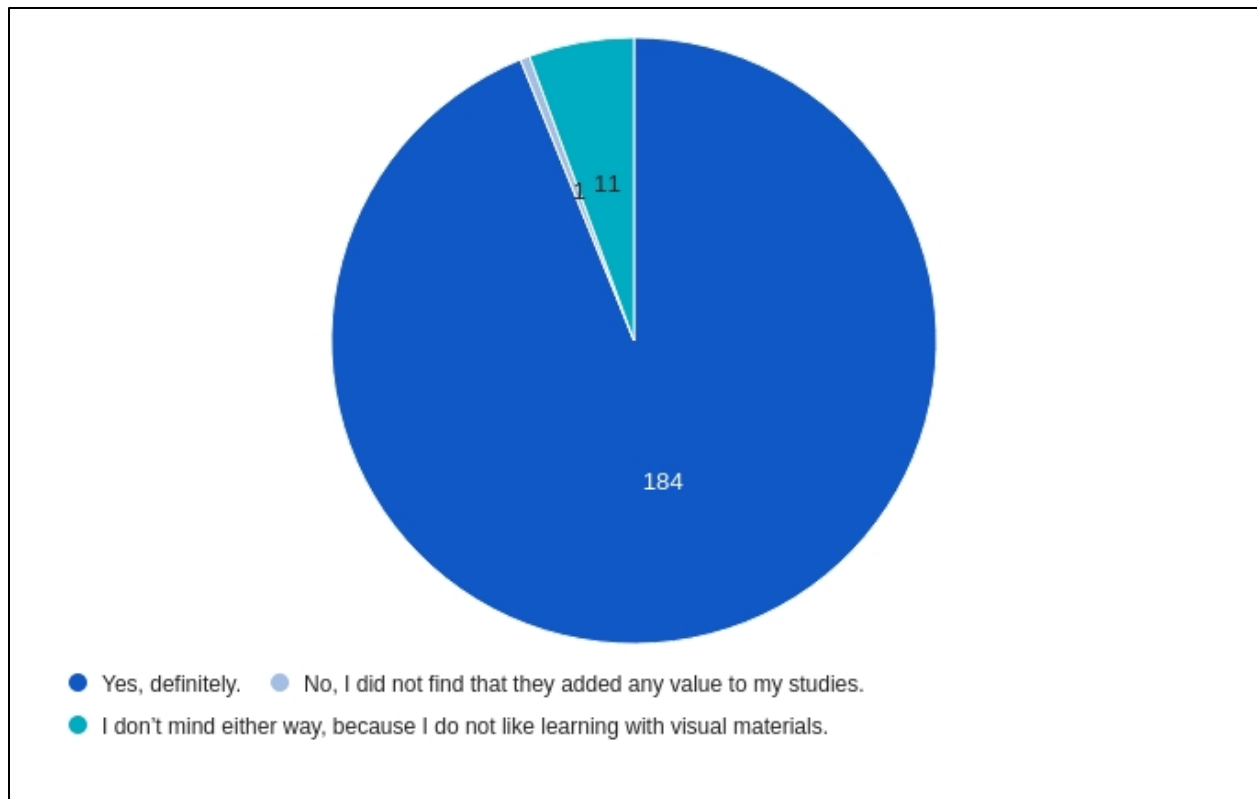


Figure 4.4: Pie chart indicating respondents' desire to see more visual learning materials in LLB modules (n=196)

To facilitate the cross-tabulation necessary for such analyses the data depicted in Figure 4.4 was recoded, according to the procedure set out in section 3.4.3 of Chapter 3. Those respondents who expressed the desire for more visuals were tabulated alongside those who did not think they added value combined with those who did not use visuals as learning materials. The recoded variable is expressed in Table 4.4.

Table 4.4: Recoded variable – Respondents’ desire for more visual materials

Desire for more visual learning materials	Frequency	Percentage
Yes, I want more visual learning materials	184	93.88%
No, I do not want more visual learning materials	12	6.12%
Total	n=196	100.00%

4.3.2.1 Respondents’ desire for more visual materials regarded alongside their ages

Firstly, this variable will be analysed alongside the ages of the respondents. It should be noted that 87.74 per cent of respondents (n=172) had come of age in a digitally driven world. Millennials are considered the first generation to be “immersed in technology” (Sandeem 2008:18) and Generation Z is described as comprising society’s “digital natives” (Barhate & Dirani 2022:140), being the first generation to be born into a digital world. A total of 12.24 per cent of respondents (n=24) from the pre-digital generations (Generation X, Baby Boomers and Silent Generation) participated in the study.

To allow for cross-tabulation, the data was recoded, to combine the respondents born into, and familiar with, the digital world (Millennials and Generation Z), and those born in a pre-digital world (Generation X, Baby Boomers, and Silent Generation). The recoded data are depicted in Table 4.5:

Table 4.5: Recoded variable – Respondents’ age categories

Age category	Frequency	Percentage
Digital era (aged between 18 and 40)	172	87.76%
Pre-digital era (aged 41 and older)	24	12.24%
Total	n=196	100.00%

The cross-tabulation of these two sets of recoded variables is depicted in Table 4.6. Because at least one cell in the cross-table had a value of less than five, inferential

statistical procedures dictate that the Fischer exact test, and not the chi-square test, must be conducted to determine the statistical significance (or not) of the results (Pietersen & Maree 2016d:275). The Fischer exact test produced a p -value of 0.53639, indicating that the result is not significant as the p -value was higher than the significance level of 0.05. Therefore, the null hypothesis may be accepted, indicating that there is no correlation between students' desire to see more visual learning materials and whether or not they grew up before or during the digital age. It may thus not be assumed that respondents who have been exposed to digital (visual) media from a younger age, enjoyed them any more in a learning milieu than those who were introduced to these media later in life.

Table 4.6: Cross-tabulation of variables – Students' expressed desire for more visual learning materials and their ages

		Age category: Digital or Pre-digital eras		
		Digital era	Pre-digital era	Total
Desire for more visual learning materials	No	9	2	11
	Yes	163	22	185
	Total	172	24	196
<i>Fisher exact statistic: 0.3823</i>			<i>P-value: 0.53639</i>	
<i>1 cell has expected count less than 5.</i>			n=196	

Barhate and Dirani (2022:140) argue that the various social generations differ in their approaches to learning and preferences for communication styles as being either visual or textual. Neither this argument, nor Bozak's (2021:115), that the generations have varying cognitive perspectives and expectations of education, as these relate to learning with visual materials, is supported by the results of this study. What is evident is that, where visual learning materials are concerned, there is no clear preference for visual materials relevant to one social generation of respondents that is not equally relevant to the other.

4.3.2.2 *Respondents' desire for more visual materials regarded alongside their English-language proficiency*

This discussion is continued with an evaluation of respondents' desire for more visual learning materials in the LLB degree, as assessed alongside their English-language proficiency. Their English-language proficiency was discussed in section 4.2.2, above. For the purposes of this evaluation the data was recoded (combining speakers of English as third, fourth or fifth language into one variable), to allow for cross-tabulation (Table 4.7):

Table 4.7: Recoded variable – Respondents' English-language proficiency

Students' English-language proficiency	Frequency	Percentage
First-language English speakers	38	19.39%
Second-language English speakers	152	77.55%
Third-, fourth, or fifth-language English speakers	6	3.06%
Total	n=196	100.00%

The recoded variable on respondents' desire for more visual materials (set out in Table 4.5, above) was then cross-tabulated with the recoded variable considering respondents' English-language proficiency. This data is set out in Table 4.8.

Table 4.8: Cross-tabulation of variables – Students' expressed desire for more visual learning materials and their English-language proficiency

		Do you want more visual learning materials, like infographics?		
		No	Yes	Total
English-language proficiency	First-language speaker	2	36	38
	Second-language speaker	8	144	152
	Third-, fourth, or fifth-language speaker	1	5	6
	Total	11	185	196

<i>Fisher exact test statistic: 1.4278</i>	<i>P-value: 0.489756</i>
<i>2 cells (0.0%) have expected count less than 5.</i>	n=196

The Fischer exact test produced a *p*-value of 0.489726 (greater than the significance level of 0.05), signifying that the null hypothesis may be accepted. The implication thereof is that there is no relationship between students' desire to see more visual learning materials and their English-language proficiency.

The empirical findings of Bell (2005:74, 77) indicate that learners less experienced in a particular language were more likely to make use of a visual interpretive aid, if available, than learners more experienced with learning in a particular additional language. He also found that learners learning in an additional language grasped concepts faster when making use of visual aids, such as images, as opposed to learning only with definitions and multilingual glossaries (Bell 2005:94). Abraham and Farís (2016:61) describe "redundancy" in learning content design as concerning "the duplication of information via the same visual channel, text and image". They argue that this redundancy can help second-language learners retain concepts better than if only communicated via text (Abraham & Farís 2016:61). This redundancy helps students learn effectively in domain or discipline learning (Abraham & Farís 2016:61), such as in the field of law. Lee and Mayer (2015:451) also support the value of redundancy in the education of second-language learners. The results of this study are not supported by the literature discussed, as the language proficiency of the respondents of this study had no impact on whether they reported preferring more visual learning materials.

Considering these cross-tabulations (presented in Tables 4.7 and 4.9) together illustrates that neither respondents' age, nor how well they communicate in English had an impact on whether they preferred more visual learning materials. The 93.88 per cent of respondents (n=184) who preferred more visual learning materials thus represented respondents of all ages and levels of English-language proficiency.

Next, the discussion turns to respondents' prior interaction with infographics.

4.3.3 Previous exposure to infographics in an educational environment

The respondents were asked to indicate whether they had previous exposure to infographics in any prior learning or training environment. If they answered in the affirmative, they had to indicate what this context was. Figure 4.5 represents respondents' responses to the "yes" or "no" aspect of this question. Only 27.55 per cent (n=54) of respondents indicated that they had previously come across infographics in educational materials.

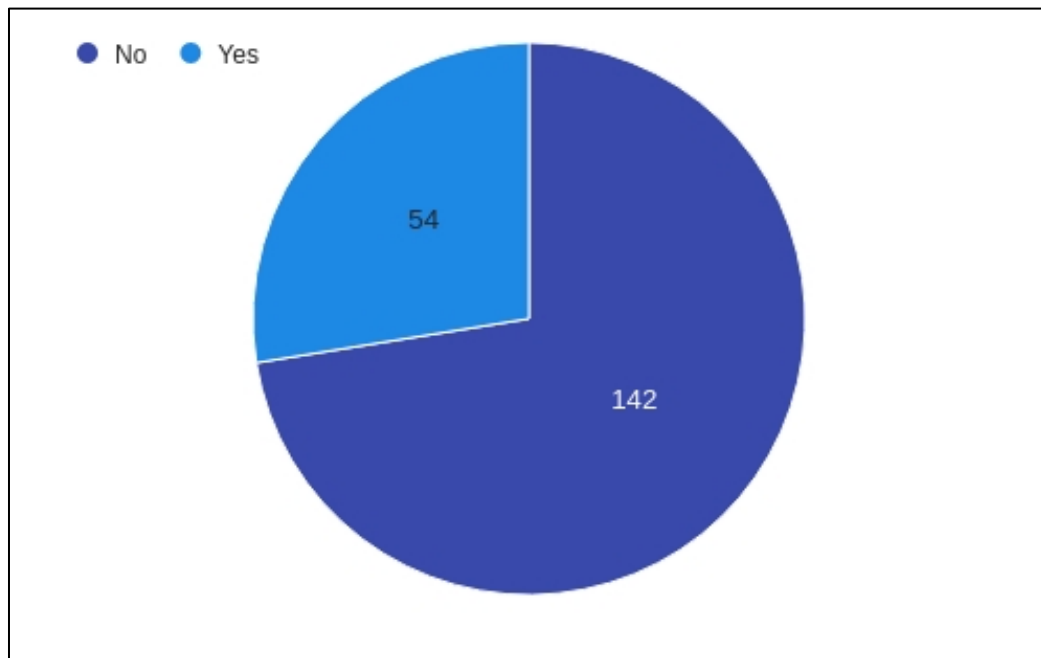


Figure 4.5: Pie chart indicating the number of respondents who had been introduced to infographics before this module (n=196)

This question provided additional data, as the respondents who had answered in the affirmative were requested to provide further details. Hearst et al (2020:2748) state that information in the form of text is by its nature complicated to visualise quantitatively. A

This word cloud indicates that most respondents who had previous contact with infographics had indicated that this had taken place during their (high) school studies. Several respondents also specified that they had been introduced to infographics in their professional capacities (indicated by the words “career”; “employer”; “work”; and “workplace”). The word cloud also indicates that respondents had (to a lesser extent) been introduced to infographics in other university courses. Some respondents also revealed through which materials, or in which contexts, they encountered education infographics (by referring to “online”; “textbook”; “PowerPoint”; “presentation”; and “video”). Some respondents referred to the subject matter of the infographics they had previously encountered (referencing “economics”; “engineering”, “health”, “retail”, and “wealth”). This word cloud correlates with the results of Gonzalez (2018:69, 93), which state that most respondents who were asked this question had indicated university, the working environment, books, online sources, retail settings, and television to be spaces in which they first encountered (educational) infographics.

Analysing all the results based on this question collectively indicates that while only 27.55 per cent of respondents had previous exposure to educational infographics, this contact had occurred in a variety of contexts and learning spaces. This illustrates the proliferation of educational infographics in a variety of fields of education and workplace training, as confirmed by Alyahya (2019:2).

The results based on the next questions under investigation focus on the respondents’ view of the pedagogical value of the visual learning materials employed in the module, HFL1501.

4.3.4 Respondents’ perceived ability to understand the infographics provided

Respondents were asked to indicate whether they thought they had understood the infographics included in the online learning materials of HFL1501. This variable provided insightful data, which called for its correlation with other variables. In this section the data

on respondents' perceived understanding of the infographics used is set out, recoded, and then analysed alongside their previous exposure to infographics and highest level of education.

Table 4.9 sets out the respondents' responses to the question, as well as the frequencies thereof. Interestingly, only 46.94 per cent of respondents (n=92) indicated that they understood all parts of the infographics. 14.79 per cent of respondents (n=29) stated that they had not made use of the infographics as learning materials at all. A total of 38.27 per cent of respondents (n=75) indicated that they did not understand some aspects of the infographics, or that they did not understand them at all.

Table 4.9: Respondents' views of their understanding of the infographics (n=196)

Response	Frequency	Percentage
Yes, I understood all parts of the infographics.	92	46.94%
Some aspects of the infographics were unclear.	48	24.49%
No, I did not understand the infographics.	27	13.78%
I did not make use of the infographics as learning resources during the course of this module.	29	14.79%
Total	n=196	100%

These results on respondents' previous exposure to and perceived understanding of infographics were cross-tabulated to allow the researcher to draw inferences from the data, which are aimed at identifying the factors that potentially influence the respondents' understanding of the infographics used in HFL1501. For the purposes of cross-tabulation, this data was recoded according to the method indicated in section 3.4.3.3 in Chapter 3. Respondents who understood only some parts or none of the infographics were grouped together. Those respondents who indicated that they did not make use of the infographics as learning material were disregarded for the purposes of this analysis. The recoded variable is expressed in Table 4.10:

Table 4.10: Recoded variable – Respondents’ perceived understanding of the infographics

Recoded variable categories	Frequency	Percentage
Yes, I understood all parts of the infographics.	92	55.09%
No, I did not understand the infographics.	75	44.91%
Total	n=167	100.00%

4.3.4.1 Respondents’ perceived understanding of the infographics and their previous exposure to infographics

Respondents’ previous exposure to infographics in an educational environment was discussed in section 4.3.1. When this data is viewed alongside respondents’ perceived understanding of the infographics, it is possible to draw inferences from the correlation between these two variables. Table 4.11 contains the cross-tabulated data.

Table 4.11: Cross-tabulation of variables – Respondents’ perceived understanding of the infographics and their prior exposure to infographics

		Have you ever been exposed to infographics in any other learning or training environment?		
		No	Yes	Total
Did you understand the infographics used in the HFL1501 module?	No	66	9	75
	Yes	49	43	92
	Total	115	52	167
Chi-square statistic: 23.2542		P-value: <0.00001		
0 cells (0.0%) have expected count less than 5		n=167		

The chi-square test produced a p -value smaller than 0.00001, which was lower than the significance level of 0.05, indicating that the result is significant and that the null hypothesis may be rejected. This means that there is a correlation between students’ perceived understanding of the infographics and whether or not they had previous contact

with infographics in an educational environment. Based on the data, it may therefore be concluded that those respondents who had seen educational infographics before had a better self-reported rate of understanding of the infographics used in this module.

4.3.4.2 Respondents' perceived understanding of the infographics and their highest qualification

Next, the researcher cross-tabulated the variables of the respondents' highest qualification (discussed earlier in section 4.2.3) with that of their perceived understanding of the infographics (Table 4.10). To group the data more sensibly, it was recoded by clustering various qualifications together. To convert the seven sub-groups of qualifications into four, pre-degree post-school qualifications (certificates and diplomas), undergraduate degrees (bachelor and honour's degrees), and post-graduate degrees (master's and doctoral qualifications) were grouped together. Respondents who had only completed matric remained in a separate group. The recoded data of those respondents who used the infographics are depicted in Table 4.12:

Table 4.12: Recoded variable – Respondents' highest qualifications

Highest qualification	Frequency	Percentage
Matric	78	46.7%
Pre-degree HE qualifications	58	34.73%
Undergraduate degrees	25	14.97%
Post-graduate degree	6	3.59%
Total	n=167	99.99%

When this data are viewed in conjunction with respondents' perceived understanding of the infographics, inferences may be drawn from the cross-tabulation (Table 4.13) thereof:

Table 4.13: Cross-tabulation of variables – Students’ perceived understanding of the infographics and their highest qualification

		Did you understand the infographics used?		
		No	Yes	Total
Highest qualification	Matric	42	36	78
	Pre-degree qualification	25	33	58
	Undergraduate degree	7	18	25
	Postgraduate degree	0	6	6
	Total	75	92	167
Fisher exact test statistic: 7.7771		P-value: 0.05085		
1 cell (0.0%) has expected count less than 5		n=167		

When looking at the frequencies expressed in this table, it initially appears to indicate that a higher level of education resulted in a better understanding of the infographics. For instance, all respondents with post-graduate qualifications indicated that they understood the infographics, while the majority of those who only had matric, did not. However, the Fischer exact test produced a p -value of 0.0585 (which was higher than the significance level of 0.05), signifying that the null hypothesis may be accepted. This means that there is no statistically significant relationship between students perceived understanding of the infographics and their highest qualification.

When these two cross-tabulations of data on students’ perceived understanding of the infographics are considered, it is evident that students understood the infographics better if they had encountered them in an educational milieu before. However, the fact that they were (or were not) more qualified than their peers had no significant impact on their understanding of the infographics as visual learning materials.

The finding that many respondents did not regard the infographics to be easily understood is corroborated by the literature. Educators must place specific focus on developing visual

literacy skills, as these skills are not honed purely because a student interacts with visuals (Asimow & Sassoubre 2018:7; Matusiak et al 2019:134; Jordaan & Jordaan 2013:77; Kędra 2018:68). It is, however, interesting to note that the results of this study indicate that prior contact with infographics increased the likelihood that respondents understood the infographics used in this course. Alford (2019:158), Gonzalez (2018:144), and Islamoglu et al (2015:1) argue that visual literacy, specifically as it relates to infographics, is crucial and that lecturers should place specific focus on developing this complex literacy. The results of this study support the need to purposively focus on developing LLB students' visual literacy, since only 55 per cent of respondents (n=92) indicated that they fully understood the infographics used in the learning materials of HFL1501.

4.3.5 Respondents' sentiments towards the value of infographics in aiding understanding

Respondents were asked two open-ended questions on whether they believed the infographics included in the HFL1501 course materials aided their understanding thereof. One question focussed on their general sentiment, while another concentrated on a specific infographic that focussed on the elements and definition of a delict.⁹ Due to the nature and scope of this study a thorough thematic analysis of the individual responses was not conducted, but the researcher provided a selection of responses to provide context to the discussion. Responses that provided the most complete information were selected and these represented both positive and negative sentiments.

The results on these questions are discussed separately, starting with the general question. Using in Microsoft Excel, the researcher counted the responses illustrating positive sentiments (containing words and phrases such as “yes”, “definitely”, “absolutely”, “I agree”) and the negative sentiments (expressed by responses like “no”;

9 In law a delict constitutes a wrongful and culpable act that causes damage to another person and that creates a legal obligation between the wrongdoer and the victim, in which the wrongdoer has a duty to compensate the victim for the damage caused (Du Plessis 2015:325).

“not helpful”, “I don’t think so”; “not really”). These results are captured in Table 4.14, below. Responses from which no sentiments could be determined are also indicated.

Table 4.14: Respondents’ sentiments towards the value of infographics in aiding their understanding of the course material

Sentiments	Frequency	Percentage
Positive	144	73.47%
Negative	50	25.51%
No clear sentiment expressed	2	1.02%
Total	n=196	100.00%

A total of 73.47 per cent (144 respondents) illustrated a positive sentiment, while 25.51 per cent (n=50) indicated that they did not regard the infographics as adding value or assisting them to understand the course content. The individual responses provide insight into why a selection of respondents expressed either a positive or negative sentiment towards the value of the infographics used in the course in supporting their understanding.

The positive sentiments expressed by the respondents provided rich and interesting data. Many respondents indicated that the fact that instructor-generated infographics were provided meant that they did not have to create their own visual learning materials to support their learning in the module:

“Yes. They eliminated the need for me to make up the colorful imagery myself.”
(Respondent 1)

“Yes. In my experience, my brain likes pictures, charts, graphics, etc. a lot more than pages full of text. In order to learn, I usually have to make my own graphic representations of the learning material as study notes in order to organize the information in my head.” (Respondent 184)

Some respondents referred to the solitary nature of studying at a distance and indicated how the infographic supported their learning. Respondent 176 expressed the following

sentiment in this regard: *“Yes, since we could not attend classes the infographics made me feel like I was in a physical class”*. Gallagher et al’s (2017:133) statement that summary infographics can be a useful addition to the online environment because they support asynchronous learning is reinforced by this response. Respondent 73 discussed the value of the infographics in supporting their learning as a person with a so-called “hidden disability” (Rosales 2020:7): *“Yes, as a Dyslexic person I have to rely on other methods to comprehend material. Pictuers, coulors, graphs or comparisons”*. This response provides an indication of how visual learning materials may potentially support learners with cognitive disabilities. Yarbrough’s (2019:3) argument in favour of exhibiting online course content for DE students in various modes is also reiterated, as the responses indicate the students have diverse learning needs and providing a variety of learning materials assists a greater number of students.

Negative sentiments towards the value of the infographics in supporting students’ ability to grasp the course content centred around respondents inability to understand the infographics themselves:

“No, I dont know what infographics are” (Respondent 21)

“No because I had no understanding of infographics” (Respondent 158)

“The infographics are unclear” (Respondent 169).

The importance of developing the specific visual literacy aimed at scrutinising infographics (as evident from the results discussed in section 4.3.4) was reiterated by these results. Again, the results of this study echo those of Alford (2019:158), Gonzalez (2018:144), and Islamoglu et al (2015:1) who stress the importance of a specific focus on the visual literacies required to effectively interpret infographics.

The question that focussed on the value of a specific infographic on the law of delict is discussed next. This infographic is included in Figure 4.7, below, and focussed on the elements of a delict, one of the core legal concepts discussed in the course content. It was devised to be simple in design, containing a limited number of visual elements, yet

able to illustrate the intended concept effectively. It is an example of an instructor-generated summary infographic, as expounded in section 2.6.5.



Figure 4.7: Infographic portraying the elemental aspects of a delict

Respondents' sentiments towards the value of this infographic in supporting their understanding of the relevant course material are set out in Table 4.15.

Table 4.15: Respondents' sentiments towards the impact of the delict infographic on their understanding of the concepts

Sentiments	Frequency	Percentage
Positive	158	80.61%
Negative	32	16.33%
No sentiment	6	3.06%
Total	n=196	100.00%

A large majority of the respondents (80.61 per cent (n=196)) illustrated a positive sentiment towards this infographic and its value in supporting their learning. Only 16.33 per cent of respondents (n=32) illustrated a negative sentiment in this regard. An evaluation of a selection of the individual responses provided interesting information on why respondents regarded the infographic as being of value, or not.

Several respondents indicated that they found the infographic helpful because it illustrated an interrelationship between concepts: “*Yes, making it in the form of a puzzle fitting together helps make it clear that all 5 elements need to be present*” (Respondent 30); “*Yes, because you can actually see and relate an image to an element. Pictures are more easy to remember than words.*” (Respondent 181). Dunlap and Lowenthal (2016:56) explain that one of the requirements of an infographic is that it should contain graphic elements that illustrate the correlation between concepts, to provide perspective and insight into the information conveyed. Respondents’ feedback illustrate that this infographic efficiently communicates the relevant correlation and context.

Respondent 26 expressed that they would be using the infographic in their future studies in the LLB degree, articulating clear support for the inclusion of this infographic in the learning material: “*Yes, I even save them to use in the law of delict module. How i wish the modules like law of delict can use them.*”

To a lesser extent, responses also expressed a negative sentiment towards the value of this infographic in aiding respondents’ understanding of the material. While some of the positive sentiments reflect respondents’ appreciation for the simplistic design of this infographic, others regarded it as being too simple, and therefore not being of sufficient pedagogical value: “*... It does not explain what a delict is, the importance of the order of these five elements and the description of these elements*” (Respondent 193). Respondents 8 and 118, respectively, expressed similar views, with mixed feelings, in the following statements: “*It helps understanding but it does seem elementary. This info could work just as well in bullet point form*”; and “*Yes and no, as it is a bit too little to really explain, but it could help as well.*” These sentiments provide guidance on how this

infographic can be revised in future. The infographic could contain a definition of a delict (which states the elements thereof in relation to one another), as well as an example of a specific delictual act, illustrated with an additional graphic element.

When respondents' sentiments towards the value of the infographics in supporting their learning are considered, both in general and in relation to a specific infographic (Figure 4.7), it may be concluded that their sentiments are overwhelmingly positive in nature. Evaluating individual responses indicated that those respondents who found the infographics to be valuable did so because the infographics illustrated interrelationships between various elements, effectively supported studying at a distance and with a learning disability, and supported revision of the material by minimising the need to create their own visual leaning materials. Negative sentiments mainly illustrated criticism of the simplistic design and respondents' inability to effectively interpret infographics.

Finally, the discussion of the results of this study considered respondents' sentiment towards the value that the visual learning elements had, or not, on their enjoyment of the module and its course content. This is discussed in the next section.

4.3.6 Respondents' sentiments towards the role of visual learning elements in their enjoyment of the study materials

Two open-ended questions asked of respondents to indicate whether they perceived the inclusion of visual learning elements in the module's study material as having an impact on their enjoyment thereof. The first question gauged their general sentiment, and the second asked whether they regarded timelines, as contained in one of the infographics used in the course, as being valuable in legal historical learning material. Due to the nature and scope of this study, a detailed thematic analysis of the responses was not conducted.

Respondents' general sentiments towards the enjoyment caused by the infographics as visual learning elements in the study material are analysed first. Microsoft Excel was used

to count the respective sentiments in the same manner as indicated in section 4.3.5. These results are expressed in Table 4.16:

Table 4.16: Respondents’ sentiments towards the value of infographics in aiding their enjoyment of the course material

Sentiments	Frequency	Percentage
Positive	136	69.39%
Negative	56	28.57%
No clear sentiment expressed	4	2.04%
Total	n=196	100.00%

Only 69.39 per cent of respondents (n=136) demonstrated a positive sentiment, which is comparable to the number of respondents who generally regarded the infographics to aid in their understanding of the study material (73.47 per cent (n=144)). 28.57 per cent of respondents (n=56) stipulated that they did not regard the visual learning materials used in the course material as adding to their enjoyment thereof. Taking individual responses into consideration offers more detailed information on respondents’ sentiments.

Many respondents referred to the value of the infographic in supporting recall, attention, and the completion of assessments:

“Yes. It definitely made the learning more enjoyable. It was refreshing and because its more visual, it was easy to recall and remember the content of the module.”
(Respondent 175)

“Yes, having infographics helps me remember important notes quickly and also if I get tired of reading long paragraphs I just look at them for distraction, then get back to studying properly.” (Respondent 181)

“Yes, they serve as a good summary, especially when revising work before an assignment or portfolio exam. Instead of having to read paragraphs of work, I can

simply look over the infographics and recall what I'd previously learned." (Respondent 20).

Several respondents mentioned the gratification the infographics imparted on the learning process alongside the fact that they felt the infographics made their studying in this module easier. Respondent 1 stated: "Yes. *They make the tasks of learning less daunting because it's not just a bunch of words that I have to stare at and make sense of myself.*" Respondents 16 and 123, respectively, added: "Yes, *because it was eye catching and more learner friendly. It was not a monotonous module crammed with page after page of just words.*"; "Yes, *it makes it easier to remember and understand concepts, thus making studying easier and more fun*".

These respondents are alluding to what Porter (2018:8) refers to as the "black-and-white stodginess" of law and traditional legal education. The respondents confirm that visual learning elements like infographics help online lecturers to avoid "*page after page of just words*", as criticised by Respondent 123. Gallagher et al's (2017:133) statement that summary infographics can be a useful addition to the online environment because they support asynchronous learning is also echoed by these responses. The results also confirm that infographics support students' recall of complex concepts and course content, as expressed by Gallagher et al (2017:132).

Most respondents who expressed negative sentiments towards the value that infographics have in increasing their enjoyment of the study material again mentioned their unfamiliarity with, and inability to understand infographics. Respondent 21 stated: "No, *I don't know what infographics are.*" And Respondent 162 expressed the following: "No...*because I didn't understand some of them*". Other negative sentiments revolved around respondents' preferences for other types of learning support: "No, *had more value from their online classes which were excellent.*" (Respondent 144). The need to develop students' visual literacy skills for infographic interpretation (Alford 2019; Gonzalez 2018; Islamoglu et al 2015) was highlighted again. The responses also indicated the importance

of including various formats of digital visual materials, including video, as suggested by Gallagher et al 2017:129.

Next, the researcher addresses the sentiments expressed towards the enjoyment contributed by specific visual elements, such as timelines. Respondents were requested to consider a specific timeline infographic included in the learning material as contextualising this question. This infographic is included in Figure 4.8. This timeline depicts the historical development of constitutionalism in South Africa over time and is another example of an instructor-generated summary infographic.

Respondents' sentiments towards the inclusion of similar timelines in the study material are set out in Table 4.17.

Table 4.17: Respondents' sentiments towards the relationship between the potential inclusion of more timelines and their enjoyment of the module

Sentiments	Frequency	Percentage
Positive	169	86.22%
Negative	14	7.14%
No clear sentiment expressed	13	6.63%
Total	n=196	99.99%

Respondents expressed a definitively positive response, with 86.22 per cent of respondents (n=196) illustrated a positive sentiment towards timelines. Only 7.14 per cent (n=14) stated that the inclusion of more timelines in the course material would not increase their enjoyment of the module. This indicates a resoundingly positive sentiment towards inclusion of timeline infographics in the course material. Considering individual responses provided more detailed information on respondents' views.

Constitutional development and constitutions in South Africa

The principle of “constitutionalism” refers to the fact that the government of a country is obliged to act in accordance with guidelines laid down in a constitution, which limits the power of the state

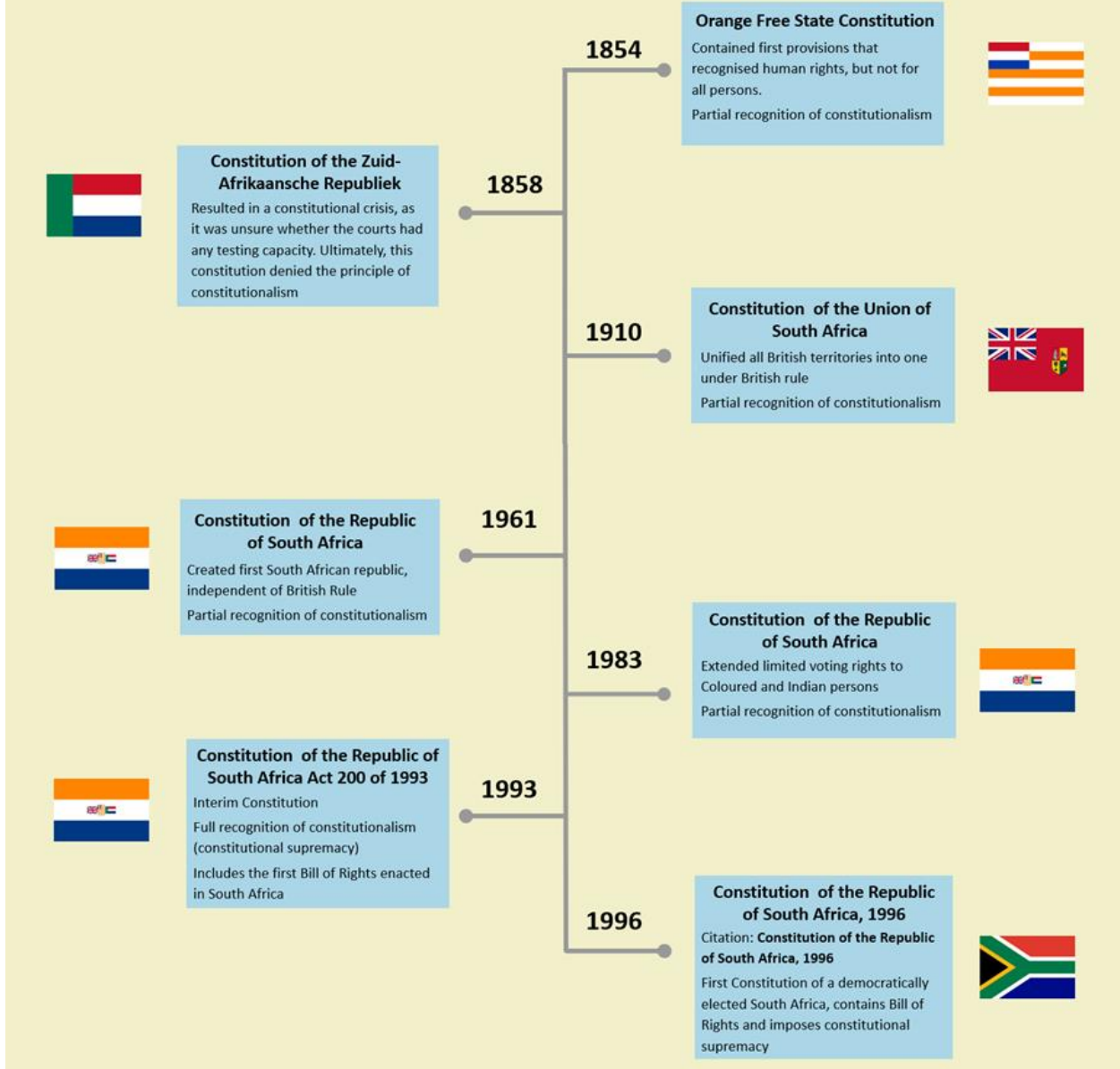


Figure 4.8: Infographics depicting timeline of constitutional development in South Africa

Various responses included specific mention of the timeline infographic's ability to spark enjoyment in the course material to the extent that respondents were inspired to learn, and to learn more: These sentiments support Alyahya's (2019:2) opinion that infographics enrich the online educational experience:

"Yes. With law there is a lot of reading and through these graphics and timelines, you enjoy learning and want to know more." (Respondent 125)

"Yes - time lines, graphics makes studying simpler and enjoyable. Plain words, reading looks exhausting and can influence one to be lazy to even start" (Respondent 165).

One respondent expressed a desire for the inclusion of more timeline infographics, as they believed these would support their ability to regard the course content in a more cohesive context: *"yes, if more timelines of such nature were included it would have been more enjoyable because I visualize the whole book as a Law timeline that starts from the medieval development of Law down to how it is linked and interwoven with today's Law."* (Respondent 82). Alrwele (2017:105) states that infographics can tell a story with a single visual and it is this potential of the infographic that this respondent alludes to. Their argument is that more timeline infographics would allow for understanding the course content, which centres around historical events and developments, as a single and unified story. Infographics are valuable visual learning artefacts that can be individualised and designed to successfully teach the content of a particular module (Alrwele 2017:105) and these results indicate that the infographics used in this module are relevant to the nature of the course content. The addition of more infographic timelines in future will aid students' understanding further.

Negative sentiments towards the timeline infographic represented varying views, related to the content in the study guide as sufficiently conveying the relevant information, and a preference for other visual learning modalities:

"No it makes it too simple" (Respondent 81)

“No, still prefer the video clips or classes with study guide and form my own metal pictures” (Respondent 144).

When respondents’ sentiments towards the value of the infographics in improving their enjoyment of the materials are evaluated, both in general and in relation to the timeline infographic (Figure 4.8), it is clear that their sentiments are decisively more positive in nature. Assessing individual responses showed that those respondents who found the infographics to be enjoyable learning materials based their arguments on the fact that the infographics sparked their interest in the learning material, aided their recall, and allowed them to understand various parts of the course content in tandem. Negative sentiments were centred around respondents’ inability to understand the infographics, or preference for video materials.

This concludes the discussion of the results based on the data collected for this study. In the following section, the researcher considered each sub-research question and hypothesis of the study to determine whether the sub-research questions were answered by the results.

4.4 RESULTS ON RESEARCH QUESTIONS AND HYPOTHESES

The discussion continues with a response to the research questions and hypotheses set out in section 1.5 of Chapter 1. For the purposes of this discussion, the results will be grouped together and discussed based on the types of data gathered and assessed to answer the research questions.

4.4.1 Results on respondents’ views on the relative benefit of each of seven different categories of visual learning elements

With this study the researcher sought to understand respondents’ views on the comparative benefit of seven categories of visual learning elements. The aim was to determine which visual learning elements respondents regarded as most beneficial. The

three digital visual materials regarded to be most useful, according to their frequency and the order of preference, are considered in this discussion. Figure 4.9 indicates the visuals most frequently selected by respondents in a bar chart, with a line chart overlaid, indicating how frequently a specific visual was selected as the most beneficial.

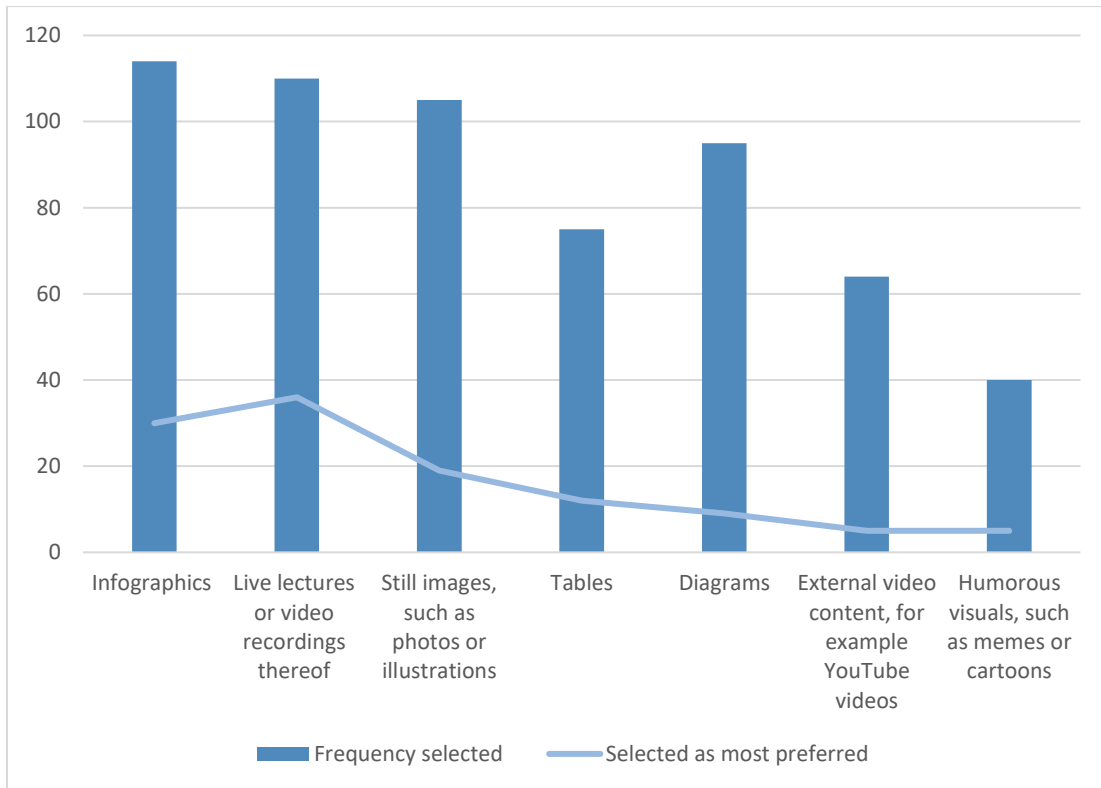


Figure 4.9: Combined results of respondents' visual learning material preferences

As indicated, infographics were regarded to be beneficial by the largest number of respondents (58.16 per cent), and video material of live lectures were ranked slightly lower (56.12 per cent). Many respondents also specified that they found still images (53.57 per cent) to be valuable learning tools. Infographics were thus considered as useful by the largest number of respondents. This correlates with the findings of Yarbrough (2019:9-10); Steyn, Botha and Mennega (2018:75); and Bicen and Beheshti (2017:105).

However, when asked to rank these visuals in the order in which respondents preferred to make use of them 18.37 per cent of respondents regarded the lecture video content as the most useful visual material, while 15.3 per cent considered the infographics as the most beneficial visual learning material. Still images were regarded the third most-preferred visual learning material, with 9.69 per cent of respondents favouring these.

4.4.2 Results on respondents' views on their desire to see more infographics and their ability to understand these

The results relevant to respondents' desire for more visual artefacts in their learning materials and their self-reported visual literacy is discussed together. In these instances, the sub-research questions had a corresponding null-hypotheses, which were examined alongside a decision test. This determined whether a specific hypothesis should be accepted. This decision rule is provided below:

If the calculated p -value was greater than the level of significance of 0.05, the null hypothesis was accepted; and if the p -value was less than the level of significance of 0.05, the hypothesis was rejected.

The chi-square and Fischer exact tests were used to determine the statistical significance of the relationship in question by providing a p -value in each instance. This process was described in section 3.4.3, in Chapter 3. Table 4.17 sets out the data used for the decision test, as well as the test results.

Table 4.17: Decision test results – respondents’ desire to see more visual materials and their visual literacy

Variable		Yes	No	Total	Decision test
Respondents’ desire to see more visual learning materials					
Age	Digital generation	163	9	172	Fisher exact statistic: 0.3823 p -value: 0.53639 → Null-hypothesis may be accepted
	Pre-digital generation	22	2	24	
	Total	185	11	n=196	
English-language proficiency	First-language	36	2	38	Fisher exact test statistic: 1.4278 p -value: 0.489756 → Null-hypothesis may be accepted
	Second-language	144	8	152	
	Third-language or more	5	1	6	
	Total	185	11	n=196	
Respondents’ perceived ability to understand infographics					
Previous exposure to infographics	Yes	43	9	52	Chi-square statistic: 23.2542 p -value: <0.00001 → Null-hypothesis may be rejected
	No	49	66	115	
	Total	92	75	n=167	
Highest qualification	Matric	36	42	78	Fisher exact test statistic: 7.7771 p -value: 0.05085 → Null-hypothesis may be accepted
	Pre-degree	33	25	58	
	Undergraduate	18	7	25	
	Post-graduate	6	0	6	
	Total	92	75	n=167	

A definitive 185 respondents indicated that they desired the inclusion of more infographics and visual elements in their learning materials. From Table 4.17 it is clear that neither respondents' ages nor English-language proficiency had an impact on desire to see more infographics. In both instances the Fischer exact test produced a p -value greater than the significance level of 0.05 and therefore, the null-hypotheses were accepted. The results in this regard do not support those of Barhate and Dirani (2022:140) or Bozak (2021:115), who argue that the social generations have varying cognitive perspectives and expectations of communication styles in education.

It was crucial that this study determined whether respondents had the capacity to interpret the infographics used in the course. Only 92 respondents believed that they understood all parts of the infographics. This finding is significant and is supported by the work of Alford (2019:158), Gonzalez (2018:144), and Islamoglu et al (2015:1). When comparing respondents' self-reported visual literacy in this regard with their previous exposure to infographics, and applying the decision test to the results, a correlation is found in the data. A p -value lower than the significance level of 0.05 was obtained by conducting the chi-square test. This indicated that there was a statistically significant relationship between the variables, and that the null hypothesis may be rejected. However, when applying the same test to the data indicating the relationship between respondents' self-reported visual literacy and their level of qualification, no significant relationship was found within the data and the null-hypothesis is accepted in this instance.

4.4.3 Results on respondents' sentiments towards infographics

Two sub-research questions concentrated on respondents' sentiments towards infographics, focussing on infographics ability to explain complex concepts, and whether their inclusion in study material makes the course more enjoyable.

Table 4.18: Respondents' sentiments towards the infographics

	Sentiments		
	Yes	No	N/A
Value of infographic: Aiding comprehension			
Generally	73.47%	25.51%	1.02%
Specific infographic: Elements of a delict	80.61%	16.33%	3.06%
Average of sentiments towards comprehension	77.04%	20.92%	2.04%
Value of infographics: Aiding enjoyment			
Generally	69.39%	28.57%	2.04%
Specific infographic: Constitutional development timeline	86.22%	7.14%	6.63%
Average of sentiments towards enjoyment	77.80%	17.86%	4.34%
Overall average of sentiments towards the value of infographics	77.42%	19.39%	3.19%

Respondents illustrated resoundingly positive sentiments in both these regards. On average, 77.04 per cent of respondents regarded the infographics in the course material as supporting their understanding of the materials, while 77.80 per cent expressed sentiments that illustrated their belief that the infographics made them enjoy the module more. An overall average of respondents' sentiments towards the infographics in the HFL1501 module was calculated. Overall, 77.42 per cent of the sentiments expressed towards the infographics were positive. This supports the findings of Yarbrough (2019:9-10).

The next section of this chapter relates the results discussed in this chapter to the theoretical framework of connectivism as leaning theory and pedagogical approach.

4.5 DISCUSSION OF THE RESULTS RELATED TO CONNECTIVISM AS A THEORY OF LEARNING

The research conducted for this study was guided by Siemens's (2005) learning theory of connectivism, which posits learning as a connected, or networked, engagement. Connectivism describes the goals of learning as making connections between the self and sources of external knowledge, understanding how to sift and shift through these

connections (or networks), and developing the ability to create different networks in future, when existing knowledge is no longer suitable (Siemens 2005; Downes 2019:113).

The theory of connectivism is based on the understanding that learners continuously attain new information and that they must develop the capacity to determine whether new information is of value (Siemens 2005). Educational research considering the theory of connectivism should determine whether it is a useful learning theory within specific contexts (Downes 2019:124). The results of this study indicate that connectivism has an important contribution to make in research focussed on visual learning in law, and digital visual literacy development. Accepting connectivism as a theory of learning implies that lecturers must accept that students will continue to learn throughout their lives, from a variety of sources of knowledge (Downes 2019:113). To do so, they need to have the skills to identify valuable sources of information, as well as the skills to interpret these sources (Utecht & Keller 2019:117). It is evident from our every-day experiences that the world has become more visually driven, and it is imperative that educators accept this visual turn (Jordaan & Jordaan 2013:78). The results of this study, as it relates to the respondents' insufficient digital visual literacy skills, indicates that students do not have the capacity to effectively learn from visual learning materials or the growing number of visuals they are exposed to outside the formal learning environment. To prepare students to learn continuously in this ever-evolving visual world, concentrating on the development of their digital visual literacy is essential. If this is not a clear and specific focus of online HE, students might disregard visual artefacts (such as infographics) as important sources of knowledge, exclude these from their networked learning activities, and fail to make the most of all the knowledge available to them.

What the results of the study also indicate is that students prefer the inclusion of visual learning materials, and in a variety of modalities. Students' varying learning needs influence their visual preferences. Since "[d]ecision-making is itself a learning process" (Siemens 2005), educators need to be prepared for the fact that students enjoy learning with visual learning elements, and will therefore select these, when available. It is thus

the educator's duty to make sure that the visual materials included in a module's learning material is of value and contributes to their learning in a pedagogically sound manner.

Siemens' (2005) argument that connectivism has implications for learning design is supported by the results of this study. The results indicate that connectivism relates to and should inform the design of individual learning artefacts, such as infographics. Where educators design their own visual materials, such as infographics, these must be clear, concise and make use of the infographic's capacity to share a great deal of information in a limited space. The results indicated conflicting sentiments towards a relatively simplistic infographic included in the module's course content (Figure 4.7), but it was evident that students did not find simplistic infographics as being of significant value when making connections between different aspects of the course material.

Siemens' (2005) argument that the student's understanding that their "[c]apacity to know more is more critical than what is currently known" encapsulates the core of connectivism. ODeL educators, as well as law lecturers, should keep in mind that visual learning materials are highly valuable learning resources. When educators include these in their learning material this should be done with care and consideration, and it is imperative to help their students develop the literacy skills to learn from these and other visuals. This is necessary to support the greater networked learning experience.

4.6 CONCLUSION

With this chapter the researcher presented the results of the study to answer the research question. The demographic information was discussed first, providing information on respondents' ages, English-language proficiency, and highest level of qualification. The results of the study, designed to answer the sub-research questions and test the hypotheses, were discussed. The discussion of respondents' views of the most beneficial visual learning materials considered both the most popular visuals and those most frequently regarded as the most useful. Results on respondents' desire to see more visual materials include in online coursework were set out and then analysed alongside their

ages (categorised as identifying them from either the digital or pre-digital social eras) and English-language proficiency. Thereafter respondents' self-reported visual literacy and ability to understand the infographics provided in the course were evaluated. These results were then analysed within the contexts of their prior exposure to infographics in an educational setting and their highest level of qualification. The discussion on the results of this study was concluded with an exposition of data on students' sentiments towards infographics as being of value in explaining complex course materials, and in increasing their enjoyment of the module by virtue of being included in the learning materials. Visual depictions of all the results were presented in the form of tables and graphs and a literature control was integrated throughout the discussion of the results. The results were then analysed together, according to the types of data collected analysed. Here the research questions and hypotheses were considered alongside the results. Lastly, the results were evaluated against the connectivist theory of learning. The final chapter summarises and draws together all aspects of this study.

CHAPTER 5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The final chapter of this study provides an overview and synopsis of the study in its entirety. Summaries of the literature review and research methodology are provided, and thereafter the results of the study are synthesised with existing literature relevant to the study. Conclusions are drawn, based each sub-research question and hypothesis, to answer the main research question of this study: What are students' views of the pedagogical value of infographics in the online learning materials of the Bachelor of Laws degree at the University of South Africa? The purpose is to determine whether the aims of the study have been achieved. The chapter concludes with a discussion of the limitations of the study, recommendations, and suggestions for further research on infographics, visual learning and digital visual literacy.

5.2 SUMMARY OF LITERATURE

The second chapter of this study consisted of an exposition of the theoretical framework of the study and literature published on the topic at the focus thereof. This discussion provided an underpinning for both the empirical research and choices on research methodology that followed. The theoretical framework adopted to guide the focus of this study was connectivism, as originally developed by Siemens (2005). The connectivist theory of learning and pedagogical approach is centred on the notion of learning as a networked practice. Learning requires making connections between the self (the learner) and sources of knowledge, with the aim of developing the capacity to make more connections in future when current knowledge becomes defunct (Siemens 2005). Connectivism contends that the act of deciding what (and from what) to learn equates learning. This understanding is relevant to visual learning and educators' curation of visual learning artefacts.

Chapter 2 further provided an exposition of the existing literature on visual learning, digital visual literacy, infographics, and the changing landscape of legal education. The researcher discussed the immense value of visual learning, indicating how this supports all learners by supporting recall, stimulating engagement, and developing critical thinking skills and those skills necessary to navigate and understand our ever-changing digital world (Alrwele 2017:105; Alford 2019:158). The literature discussion also analysed the importance of digital visual literacy as a core competency essential to today's learners. Technological advances have influenced educational practice and how information is transferred (Alyahya 2019:1; Matusiak et al 2019:124). As a result, visual literacy has emerged as a crucial digital literacy, which may well be successfully developed through the pedagogically sound use of visual resources (Galloway 2017:11). Here infographics have a vital role to play. Section 2.6 of Chapter 2 set out the varying views on what constitutes infographics, and their vastly divergent definitions. The researcher concluded, within the context of this study, that an infographic is a stand-alone visual representation of content, consisting of a combination of textual and visual elements, employed to convey an entire message in an easily understandable way. This discussion also included an exposition of the value of infographics in ODeL, based on their uncanny ability to effectively communicate complex information at a distance. The pedagogical value of infographics, as well as the necessity of using them in a pedagogically sound manner, and the immense worth of instructor-generated summary infographics in course materials (Gallagher et al 2017:132) were also evaluated. Students' positive sentiments towards the value of studying with infographics, as supported by empirical research (Yarbrough 2019:8), were also expounded. The discussion also set out the need for new research on the value of infographics in ODeL and various teaching disciplines, such as law.

The literature review also considered the changing landscape of legal education and the dire need to instil digital visual literacy skills in law graduates. A standalone course in visual literacy for law students would be the ideal (Sassoubre 2018:83), as the current textually-focussed approach to legal education is pedagogically unsound, has detrimental consequences and, therefore, needs to change (Roberts 2019:65). The researcher

discussed the emerging views among law lecturers that a specific focus on developing digital visual literacy is required to produce law graduates who are fit-for-purpose and ready to serve their communities. The literature review culminated in a conclusion that it is essential to include digital visual learning materials in online and legal education (in South Africa), and in this regard the inclusion of infographics in study materials could be used to develop crucial visual literacy skills.

5.3 SUMMARY OF METHODOLOGICAL PROCESSES AND PROCEDURES

Chapter 3 set out the research methodology employed in this study. The study was based on a non-experimental quantitative research design, executed as a questionnaire. The positivist research paradigm best suited the research design and purpose of this study. Positivism is concerned with the observable reality of society, requires the interpretation of unbiased data, and allows for objective deduction independent of the views or influences of the researcher (Boeren 2018:65). The positivist paradigm was pertinent to the study as it prescribes objectivist epistemology, naïve realist ontology, and beneficence axiology (Kivunja & Kuyini 2017:31). This cross-sectional descriptive study employed a single online self-administered questionnaire as the survey instrument. This research design suited the purpose of this study, which was merely to describe information gathered from the respondents at a single point in time. This allowed the researcher to develop a basic understanding of the topic, on which little is currently known (in this regard see sections 1.4 and 2.6.7 in Chapters 1 and 2). The questionnaire was designed to determine students' views on the value of the visual learning materials utilised in the HFL1501 online learning materials presented on the LMS.

The questionnaire, as data collection instrument, contained demographic questions as well as open- and closed-ended questions focussed on gathering data aimed at reaching the aim of the study. To this end, the data collection instrument gathered information based on the respondents' preferences, views, and visual literacy skills. The questionnaire was developed and administered online with the Qualtrics XM™ software

package. The population of the study consisted of all students registered for the module, HFL1501, in the 2021 academic year (11 444 students). This sampling strategy is that of probability sampling, which dictates that each member of the population should have an equal chance of constituting the sample. The sample (n=196) was made up of all the respondents who returned the completed questionnaire. The data analysis techniques used in this study were descriptive and inferential statistical analysis. This achieved the purpose of the quantitative study as it allowed for the interpretation of numerical data to ultimately reach conclusions on the views and preferences of the respondents. Descriptive techniques facilitated the exposition of the basic characteristics of the nominal data and the inferential analysis techniques enabled the process of drawing conclusions from data on more than one variable simultaneously. Both the Qualtrics XM™ and SPSS software packages were used to complete the statistical analyses mandated by the data analysis phase of this study.

5.4 SYNTHESIS OF THE RESULTS

Tight (2017:2-3) argues that “the overall theoretical relevance and the quality of an inquiry tend to be enhanced if existing theories (of various types) are carefully integrated in the work so that the researcher can make a critical contribution to the wider knowledge field through new interpretations of data.” With this discussion the researcher analyses the results of the study alongside existing literature on the topic, to understand the findings within the context of what is currently known.

The findings of this study, as discussed in Chapter 4 (section 4.3.1), indicated that infographics were considered useful by the largest number of respondents. This correlates with the findings of Yarbrough (2019:9-10); Steyn, Botha and Mennega (2018:75); and Bicen and Beheshti (2017:105). However, when respondents’ preference for their most preferred visual learning materials were considered, conflicting findings resulted. The results indicated that respondents regarded the lecture video content as the most useful visual material. When these preferences are considered in concert, it is

evident that infographics were the most popular visual learning material, but they were not respondents' most preferred visual learning material. Yarbrough's (2019:3) findings indicate that respondents' preferences for specific types of visual learning materials differ, because they have varying learning needs and preferences. This study supports her findings, as not all the respondents preferred the same visual learning materials.

As indicated in section 4.3.2, in Chapter 4, a definitive 93.88 per cent of respondents indicated that they desired the inclusion of more infographics and visual elements in their learning materials. This finding is supported by the research of Sandford-Couch (2013), Porter (2018), and Roberts (2019) who indicated that law students do not enjoy text-heavy learning materials, and that this approach to legal education is pedagogically unsound. Further evaluation of these results by means of inferential statistical analysis indicated that respondents' ages, categorised as being representative of being from either the pre-digital or digital eras, had no impact on their preference for more visual learning materials. The initial assumption that this study would find that younger respondents who grew up surrounded by digital technology and visuals would enjoy visual materials more, was thus incorrect. These results do not support those of Barhate and Dirani (2022:140) or Bozak (2021:115), who argue that the social generations have varying cognitive perspectives and expectations of communication styles in education. They argue that younger students prefer more visually laden learning materials, which was not found in this study. The study also considered whether there is a notable difference between the views of students in three different groups (English first-language; English-second language; and English third- or more language speakers) regarding their desire for the inclusion of more infographics in their learning material. The results in this regard are set out in Table 4.14 and indicated that there is no relationship between respondents' desire to see more visual learning materials and their English-language proficiency. Again, the results in this regard are not supported by the literature. Bell's (2005:74, 77) results illustrated that the learner less familiar with learning in a second language made use of visual aids, such as photos and graphics, more frequently than the learner more experienced in learning and reading in that language. Abraham and Farís (2016:61) and Lee and Mayer (2015:451) also found

that second-language learners learn more effectively from a combination of textual and visual learning materials.

To determine whether respondents had the capacity to interpret the infographics used in the course was crucial, since the literature consulted before the questionnaire was administered (as discussed below) indicated that many students lack the digital visual literacy skills required to interpret infographics effectively. The results on respondents' self-reported visual literacy capabilities are expressed in section 4.3.4, in Chapter 4. Only 55.09 per cent of respondents believed that they understood all parts of the infographics provided in the course material. These results are supported by the work of Alford (2019:158), Gonzalez (2018:144), and Islamoglu et al (2015:1), who argue that a specific visual literacy skill must be developed in students before they can learn from infographics effectively. Educators may, therefore, not assume that by merely including infographics in their course material all students will automatically benefit.

These results were considered further by evaluating the impact, or not, of respondents' previous exposure to infographics and their highest level of education to determine whether these factors impacted their ability to understand the infographics. The results, set out in section 4.3.4 of Chapter 4, indicated that there was no significant difference between students grouped in terms of their previous qualification and their perceived understanding of infographics. A respondent's tertiary qualification, or lack thereof, had no significant impact on whether they thought they understood the infographics used in the online learning material. These results are aligned with Sassoubre (2018:83) and Colbran and Gilding's (2019:2) argument that it is imperative to purposefully develop the visual literacy skills of students. As the results indicated, merely completing a qualification does not automatically endow a student with skills, such as visual literacy, that are not specifically developed as part of the curriculum.

The results on respondents' self-reported visual literacy did, however, indicate that there was an association between students' ability to understand the infographics and whether they had prior exposure to infographics in an educational environment. Table 4.11 set out

the results in detail. Respondents more frequently reported understanding the infographics if they had encountered them in an educational milieu before. This is a significant finding. Asimow and Sassoubre (2018:7), Matusiak et al (2019:134), Jordaan and Jordaan (2013:77), and Kędra (2018:68) all state that mere exposure to and interaction with visuals does not result in the development of visual literacy skills. They argue that directed intervention is required in this regard. While this seems to be the accepted position on general interaction with visual learning artefacts, this study indicates that this may not be accurate in the case of infographics. The results of this study illustrate that the more students engage with infographics, the more likely they are to understand them.

With this study the researcher also investigated students' sentiments towards the value of infographics in helping them understand complex course materials. When asked how they regarded this capacity of the course infographics, both in general and with reference to a specific infographic used in the course, 77.04 per cent of respondents indicated that they regarded the infographics as aiding their understanding of the materials (see sections 4.3.5 and 4.4.3, in Chapter 4). When a selection of respondents' individual sentiments in this regard were considered, it became evident that those respondents who found the infographics to be valuable did so because the infographics illustrated interrelationships between different aspects of the content, effectively supported learning at a distance, and supported revision efforts. Negative sentiments mainly illustrated respondents' inability to effectively interpret infographics. The results support those of Gallagher et al, who argue that innovative visual materials support asynchronous learning (2017:133) and infographics support comprehension and recall of complex materials (2017:137-138). Yarbrough's (2019) results also mirror those of this study. She reported that exceptionally high numbers of students regarded infographics as valuable tools that summarise key concepts, effectively supporting studying for the final exam; and aiding their content retention Yarbrough (2019:8). Alyahya's (2019) work further supports the results. He (2019:1) argued that the inclusion of infographics in learning materials resulted

in higher levels of understanding and supported the development of cognitive abilities by promoting independent learning and creativity.

The results of the study also provided valuable data on respondents' sentiments towards their increased enjoyment of the material, as attributed to the inclusion of infographics therein. The results discussed in sections 4.3.5 and 4.4.3 of Chapter 4 illustrate that 77.08 per cent of respondents confirmed a positive sentiment in this regard. Individual responses indicated that respondents who found the infographics to be enjoyable did so because the infographics renewed their interest in the module's learning materials, supported their recall, and allowed for a holistic understanding of the course content. Negative sentiments mainly concentrated on respondents' inability to understand the infographics, or their preference for video materials. Bicen and Beheshti (2017:102, 105) have also found that the inclusion of infographics in course content increased students' engagement with course materials and their motivation. Their findings thereby supported the results of this study, illustrating the need to develop law students' visual literacies, as supported by Colbran and Gilding (2019:2), who go on to argue that these skills are crucial to prepare them for legal practice in an ever-developing visual world.

5.5 CONCLUSIONS ON THE RESEARCH QUESTIONS AND HYPOTHESES

With this study the researcher aimed to gauge students' views on the pedagogical value of infographics as online learning materials. The main research question, sub-research questions (SRQ) and hypotheses (H) were presented in Chapter 1. In this section these questions are answered, and the hypotheses addressed.

SRQ 1: What are students' views of the relative benefit of each of seven different categories of visual learning elements, namely: still images; tables; diagrams; infographics; external video content; recorded live lectures; and humorous visuals?

Students regarded infographics, recordings of live lectures, and still images as the three most useful digital visual materials used. However, when asked to rank these it became

evident that students most frequently preferred the recordings to the infographics and still images. It is thus concluded that students regard infographics as useful visual learning materials, but that the use of a variety of visual learning materials, including class recordings should be employed when curating online visual learning materials.

SRQ 2: What are students' views of the extent to which they would like to see visual learning materials included in future study material?

Students (93.88 per cent of respondents) indicated that they support the inclusion of visual artefacts in their online learning materials. It is concluded that the inclusion of visual learning materials is supported by students.

SRQ 3: Is there a significant difference between the views of students in two age categories (pre-digital generation; digital generation) regarding their desire or not for the inclusion of more infographics in their learning material?

H₀1: There is no significant difference between students grouped in terms of age categories (pre-digital generation; digital generation) and their desire for more infographics in learning materials.

The null hypothesis was retained, and the conclusion was that students supported the inclusion of visual learning materials in their coursework, regardless of whether they represented the pre-digital or digital generations.

SRQ 4: Is there a significant difference between the views of students in three different groups (English first-language; English-second language; and English third- or more language speakers) regarding their desire or not for the inclusion of more infographics in their learning material?

H₀2: There is no significant difference between students grouped in terms of their English-language proficiency (English first-language; English-second language; and English third- or more language speakers) and their desire for more infographics in learning materials.

The null hypothesis was retained, and it was concluded that students support the inclusion of visuals elements in their online learning materials regardless of their level of English-language proficiency.

SRQ 5: What are students' views of their own visual literacy skills required to understand the infographics in their learning material?

Nearly half of the students indicated that they did not understand the infographics, or all parts thereof. Based on these results, it was concluded that an alarming number of students who participated in this study do not have a sufficient level of digital visual literacy to effectively learn from infographics without additional interventions to develop this literacy.

SRQ 6: Is there a significant difference between the views of students who were, or not, previously exposed to infographics in an educational context, and their perceived understanding or not of infographics in their learning material?

H₀₃: There is no significant difference between students who have previously been exposed to infographics or not, and their understanding of infographics.

The null hypothesis was rejected, which allowed for the conclusion that there is an association between students' prior exposure to infographics and their self-reported ability to understand these.

SRQ 7: Is there a significant difference between the views of students in four different groups of previous qualifications (matric; certificate / diploma; bachelor's degree; postgraduate degree) regarding their perceived understanding or not of infographics in their learning material?

H₀₄: There is no significant difference between students grouped in terms of previous qualification (matric; certificate / diploma; bachelor's degree; postgraduate degree) and their perceived understanding of infographics.

The null hypothesis was retained, and it was concluded that students' self-reported ability to understand the infographics was not significantly affected by their level of qualification.

SRQ 8: What is students' sentiment towards the value of infographics in understanding complex concepts and definitions contained in the learning material?

Students indicated positive sentiments towards the value that infographics have in supporting their understanding of complex course materials. It was concluded that the inclusion of infographics in online learning materials help students to understand complex concepts and definitions.

SRQ 9: What is students' sentiment towards their increased enjoyment of the material attributed to the inclusion of infographics therein?

Students expressed positive sentiments towards the statement that infographics increase their enjoyment of the course materials employed in the module. Therefore, it was concluded that the inclusion of infographics in online learning materials increases students' enjoyment thereof.

Main research question: What are students' views of the pedagogical value of infographics in the online learning materials of the Bachelor of Laws degree at the University of South Africa?

With relation to students' views on infographics, digital visual learning elements, and their perceived visual literacy, the researcher draws the following conclusions:

- Students regarded infographics as useful visual learning materials, but also indicated a preference for the inclusion of additional types of visuals, such as video recordings and other still images.
- Students supported the inclusion of more visual elements in their online learning materials, and neither their ages nor English-language proficiency impacted their views in this regard.
- Many students indicated that they did not perceive themselves as sufficiently visually literate to learn effectively from the infographics. While their highest level of

qualification had no impact on their perceived literacy, prior exposure to infographics in an educational context did positively impact their ability to understand infographics.

- Students indicated that infographics helped them to better understand complex course materials.
- Students indicated that the inclusion of infographics in the course material increased their enjoyment of the module.

5.6 LIMITATIONS

Due to the novel nature of this study, and the fact that it was limited in scope to meet the requirements of a dissertation of limited scope, it had several limitations. The questionnaire had a very low response rate. Only 1.78 per cent of the population completed the questionnaire, so the results based on the small sample cannot be generalised to the population (Aggarwal & Ranganathan 2019:36). While some responses on the open-ended questions included in the study were considered to provide context to the quantitative data based on respondents' sentiments towards the infographics, a more detailed thematic analysis, as required by a qualitative research approach and strategy, would have provided a more detailed picture. Conducting a detailed thematic analysis of the respondents' written responses would have provided additional insight into the topic under investigation, but the scope of the study did not allow for the inclusion thereof.

5.7 RECOMMENDATIONS

From the results of this study, it is clear that students perceive instructor-generated summary infographics as being of pedagogical value. The researcher has made recommendations on how these perceptions may be leveraged to improve online learning materials and support the development of students' digital visual literacy skills.

5.7.1 Recommendations to Management of ODeL Institutions

- Since the results of the study show that developing students' visual literacy is imperative, it is essential that academic staff who teach at ODeL institutions develop this same literacy. Managers at these institutions should make a concerted effort to focus on providing professional development opportunities to develop the visual literacy of academics.
- Managers should ensure that training in creating pedagogically sound infographics is available. This further involves making templates and tools available to academics to support them in designing these graphics. Purchasing repositories of electronic infographic templates with the required creative commons licences will facilitate this process.
- Managers should encourage academics to create and share their infographics as open educational resources (OER) to allow these infographics to be distributed within institutions, across Africa, and in the world. Collaboration among ODeL institutions will greatly support these attempts.
- Managers of ODeL institutions should purposefully create awareness among academics about the urgency of developing students' digital and visual literacy skills, to ensure that the institution produces graduates who are fit for purpose.

5.7.2 Recommendations to ODeL practitioners

- When drafting learning materials ODeL practitioners should consider the nature of learning (and not just teaching) at a distance and how more can be done to engage learners and keep them interested in learning materials. One of the strategies that may be used is to include visuals, such as infographics, in learning materials. These should be used to communicate a great deal of information in a limited amount of space, illustrate the relationship between concepts, and stimulate students' learning experience in a particular course.

- Learning designers who aid academics in drafting their learning materials should encourage the inclusion of more pedagogically sound visuals in learning materials. Special efforts should be made in the case of traditionally text-laden fields and subjects.
- To encourage the development of students' digital visual literacy, ODeL practitioners should include visuals, such as infographics, as sources of information in their materials. Images and graphics should not merely be included in learning materials to increase their visual appeal. This approach will help students to develop an understanding of and regard for graphics as crucial learning elements and valuable sources of information.
- The principles of connectivism should guide ODeL practitioners' efforts to facilitate learning with visual materials. Adopting a connectivist approach to learning design in general, as well as the development of individual visual learning elements, will guide practitioners in developing pedagogically sound visual learning materials.

5.7.3 Recommendations to South African law lecturers

- A concerted effort should be made to develop LLB students' digital and visual literacy skills. Developing these skills should become an additional focus of the existing skills courses presented to first-year law students as soon as possible. Individual law faculties may consider focussing on developing these skills when (re)developing modules, but a more standardised approach would have a greater impact. When the CHE determines that it is again time to evaluate and revise the LLB curriculum, it may be valuable to advocate for a compulsory stand-alone module in the LLB curriculum that focusses on the development of digital and visual literacy skills. The South African Law Deans Association and the Society of Law Teachers of Southern Africa could prepare a proposal and provide a draft curriculum to be considered by the CHE in future.

- Law lecturers should endeavour to include visual learning elements, directly relevant to their specific courses, in their online and blended course materials. These visuals should illustrate and explain legal principles and rules relevant to the module, ensuring their pedagogically sound use. Images, such as infographics, diagrams, illustrations, and photos, should add value to the course material and not be included purely for the sake thereof.
- Law lecturers, regardless of the modality in which they teach, should include a variety of visual materials (specifically infographics, lecture recordings, and still images) in the online learning materials available to students. Lecturers who teach via ODeL exclusively should consider uploading video recordings of classes or creating short videos on key concepts of course materials. For law lecturers teaching at a distance, this is also crucial, as it helps bridge that physical gap between educator and learner.
- South African law lecturers should create an OER repository relevant to teaching law in South(ern) Africa. Infographics, illustrations, and other visual learning materials could be shared to lessen the burden of creating valuable visual learning materials for students.

5.7.4 Recommendations to ODeL students

- ODeL students should consider visuals as potential sources of valid and valuable information, both inside and outside the formal learning environment. Where course materials include visuals that they do not understand, ODeL students should contact their lecturers to seek clarity.
- ODeL students should be open to provide constructive feedback to their lecturers on the (visual) course materials used in their modules. Where course content is too heavily text-laden, or where visual materials are of little value, students should bring this to the attention of their lecturers through course evaluations or other channels.

- Students should take up the challenge to develop their visual literacy skills. In this regard they should seek out infographics online and practise interpreting these.

The next section of this chapter provides suggestions for future research on infographics in ODeL, developing students' visual literacy skills, and teaching law (online) with a focus on visual learning materials.

5.8 SUGGESTIONS FOR FURTHER RESEARCH

Since the aim of this study was to identify themes on the topics of visual learning and the use of infographics in online learning materials, the researcher can make several suggestions for further research. Future research on infographics as valuable visual learning materials and the use of infographics in both legal education and ODeL could adopt a variety of approaches.

Additional research with a more specific focus on the theory and practice of learning design, and how practitioners may be supported in developing and implementing visual learning materials, will have immense value. Studying the use of infographics in the course content of modules in other fields of study could provide all practitioners with an interest in infographics with a more rounded understanding of the topic. Experts in the field of visual literacy could provide insight into how to develop stand-alone courses focussed on developing the visual literacy for students studying outside the visual arts. Future research could further investigate what constitutes a valuable instructor-generated summary infographic. Research focusing on students' preferences for complex versus elementary infographics, or students' most preferred infographic layouts and components could be of value to instructors who wish to design infographics for their courses. More detailed research on law students' visual literacy needs, and the demands of legal practice, could guide how visual learning materials for law students are designed. There is still much to learn about how visual learning materials, and specifically infographics, can support students with learning disabilities. Conversely, research on how visually

impaired students may be supported with alternative learning materials may also be of value.

Alternative methodological approaches should also be considered. Studies based on experimental and longitudinal research designs, assessing interventions with infographics as visual learning elements, could evaluate the impact of the inclusion of these materials and how students' performance and engagement in a module may be improved. Mixed methods studies could gather valuable data of both a qualitative and quantitative nature, thereby providing a deeper understanding of the use and impact of infographics and visual literacy development in online learners. Finally, it is recommended that a similar study be done, in an attempt to obtain a larger sample size, allowing for the generalisation of results.

5.9 CONCLUSION

With this study the researcher aimed to determine the views of first-year LLB students studying at Unisa on the use of infographics in their online learning materials. In this regard, nine sub-research questions were investigated. The study was informed by Siemens' (2005) learning theory and pedagogical approach of connectivism and a review of literature on the key concepts under investigation. The study was situated in the positivist research paradigm and adopted a quantitative approach and descriptive strategy. An online self-administered questionnaire was completed by a sample of 196 students registered for the module HFL1501 in the 2021 academic year. They were selected by means of probability sampling. The collected data were analysed statistically with the Qualtrics XM™ and SPSS software packages.

Results of the study indicated that the respondents perceived infographics as useful visual learning materials, but that they would also like the inclusion of additional types of visuals, such as video recordings and still images, other than infographics. Students endorsed the inclusion of additional visual elements in their online learning materials, and neither their ages nor English-language proficiency affected their preferences in this

regard. Students' positive sentiments indicated both that infographics helped them to better understand complex course materials and increased their enjoyment of the module. Worryingly, the results also indicated that almost half of the respondents did not perceive themselves as adequately visually literate to benefit from infographics in learning materials. It was, however, evident that previous interactions with infographics in an educational context improved the students' perceived ability to understand the infographics, but their level of qualification had not. Considering the synthesised and analysed results enabled the researcher to arrive at suggestions for ODeL and legal educational practice, and also revealed an array of areas for further research on both the use of educational infographics in online and legal education. Thereby the ultimate goals of the study were achieved.

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ANNEXURE A: VISUALISATION OF ONLINE QUESTIONNAIRE



Historical Foundations of South African Law: Survey on the use of infographics as learning materials

This questionnaire is designed to develop an understanding of your opinion on the infographics used as digital visual learning materials in the HFL1501 module. An infographic (or information graphic) is a visual depiction of content that combines text and graphic elements to explain complex concepts or course content in a specific context or situation.

Thank you for your interest in this survey.

Please indicate whether you have read the description and purpose of the study, as provided in the e-mailed invitation to participate, and whether you provide your informed consent to participate in the study.

Yes, I understand the purpose of the study and I hereby consent to participate therein.

No, I do not wish to participate in the study.

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What is your age?

Younger than 18

18-24

25-40

41-56

Older than 57

Are you a first-language English speaker?

Yes, English is my first language

No, English is my second language

No, English is my third language

No, English is my fourth language

Other

What is your highest qualification?

Matric

Diploma

Certificate

Bachelor's degree (three years)

Honour's degree or four-year bachelor's degree

Master's degree

Doctorate

Back

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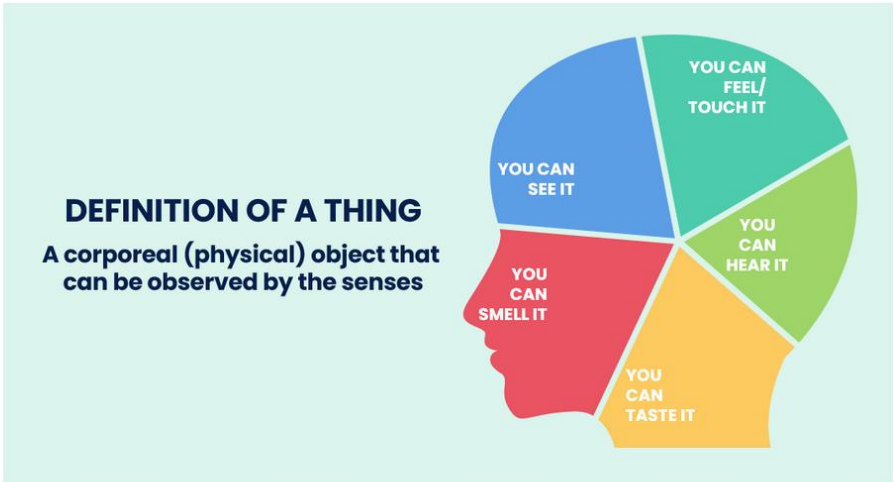
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Various infographics were included in the online learning materials for this course. These were included in the myUnisa online lessons, uploaded as additional resources, and included in the slides for the live lectures. To provide context for the upcoming questions, please see the three examples of infographics on the law of property. These infographics are only some of those included in the learning materials and merely serve as examples.



RIGHT TO PROPERTY

s25	<p>READ AND UNDERSTAND</p> <p>Read all nine subsections of this section of the Constitution carefully (ss 25(1)-(9)).</p> <p>What is the purpose of this section? How does it differ from section 26?</p>
<p>IMPORTANT LEGISLATION</p> <p>Since the enactment of the Interim and final constitutions, various acts have been passed.</p> <p>Read pp94-95 of the study guide carefully.</p>	<p>IMPORTANT CASE LAW</p> <p>Various cases have been decided on s25, but for the purposes of HFL1501, please study:</p> <p><i>Daniels v Scribante</i> Read pp 95-97 of the study guide carefully.</p>

RIGHT TO HOUSING

s26

READ AND UNDERSTAND

Read all three subsections of this section of the Constitution carefully (ss 26(1)-(3)).

What is the purpose of this section?
How does it differ from section 25?

IMPORTANT LEGISLATION

Prevention of Illegal Eviction from and Unlawful Occupation of Land Act 19 of 1998 (PIE Act)

Extension of Security of Tenure Act 62 of 1997 (ESTA)

IMPORTANT CASES

PE Municipality v Various Occupiers
Occupiers of Erven 87 & 88 Berea v De Wet NO
Baron v Claytile

Read pp 99-103 of the study guide carefully.

Please click "Next" to continue to the questions that follow.

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Before being introduced to infographics as part of the study material in this course (HFL1501), have you ever been exposed to infographics in any other learning or training environment? If yes, please provide details in this regard.

Yes

No

Did you understand the infographics used as part of the online learning material in the HFL1501 module?

Yes, I understood all parts of the infographics.

Some aspects of the infographics were unclear.


No, I did not understand the infographics.

I did not make use of the infographics as learning resources during the course of this module.

Consider the infographics that were included in this module's online learning materials. Did these infographics make you enjoy the learning material more than you would have if they were not included in the learning materials? Please indicate "yes" or "no" and explain your answer.

Did you find that the infographics improved your understanding of the complex concepts and definitions described in the study guide? Please indicate "yes" or "no" and explain by providing a description of your experience.

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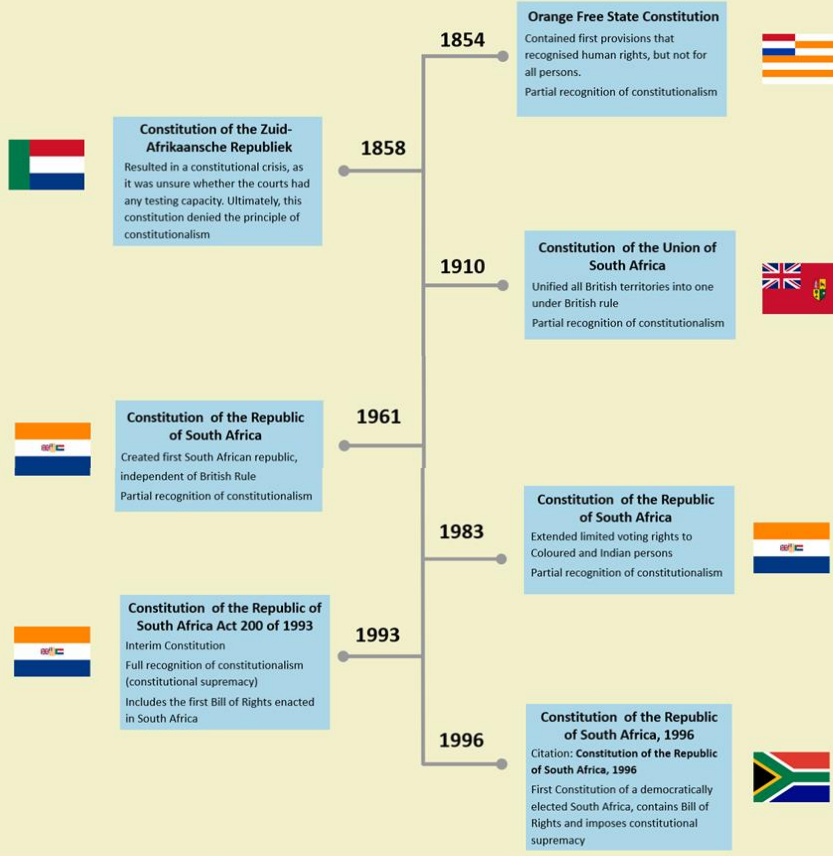
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UNISA 
university
of south africa

Consider this infographic on the historical development of constitutionalism in South Africa. Do you think you would find the module's learning materials more enjoyable if it contained more timelines or similar descriptive images? Please provide reasons for your answer.

Constitutional development and constitutions in South Africa

The principle of “constitutionalism” refers to the fact that the government of a country is obliged to act in accordance with guidelines laid down in a constitution, which limits the power of the state



Please type your answer here:

Consider this infographic on the elements of a delict. Do you think that this infographic helped you to understand the five elements of a delict and their interrelationship better than if you had only read the description thereof in the HFL1501 study guide? Please provide a “yes” or “no” and explain your answer.



Please type your answer here:

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Consider your experience of studying the HFL1501 course material. Which of the following visual learning elements would you say has been most beneficial for you in terms of understanding the the course content? (You may select more than one.)

Still images, such as photos or illustrations

Tables

Diagrams

Infographics

External video content, for example YouTube videos

Live lectures or video recordings thereof

Humorous visuals, such as memes or cartoons

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You have selected Still images, such as photos or illustrations, Tables, Diagrams, Infographics, External video content, for example YouTube videos, Live lectures or video recordings thereof, Humorous visuals, such as memes or cartoons as beneficial to your learning experience in this module. Please rank these in order of preference by dragging and dropping them in order.

- 1 External video content, for example YouTube videos
- 2 Still images, such as photos or illustrations
- 3 Infographics
- 4 Diagrams
- 5 Live lectures or video recordings thereof
- 6 Tables
- 7 Humorous visuals, such as memes or cartoons

Would you like to see more visual learning materials, such as infographics, included in the study material for your other modules presented by the College of Law?

Yes, definitely.

No, I did not find that they added any value to my studies.

I don't mind either way, because I do not like learning with visual materials.

Back

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Submit

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We thank you for your time spent taking this survey.
Your response has been recorded.

0%  100%

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ANNEXURE B: ETHICAL CLEARANCE CERTIFICATE



UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2021/09/08

Ref: **2021/09/08/58549900/16/AM**

Name: Ms A Bauling

Student No.:58549900

Dear Ms A Bauling

Decision: Ethics Approval from
2021/09/08 to 2024/09/08

Researcher(s): Name: Ms A Bauling
E-mail address: baulia@unisa.ac.za
Telephone: 072 433 7520

Supervisor(s): Name: Dr F Gani
E-mail address: ganif@unisa.ac.za
Telephone: 079 921 9222

Name: Prof G van den Berg
E-mail address: vdberg@unisa.ac.za
Telephone: 012 429 4895

Title of research:

Students' perception of the value of infographics as learning materials in the Bachelor of Laws degree

Qualification: MEd ODL

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2021/09/08 to 2024/09/08.

The low risk application was reviewed by the Ethics Review Committee on 2021/09/08 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.

The proposed research may now commence with the provisions that:

1. The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.



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2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
8. No field work activities may continue after the expiry date **2024/09/08**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

The reference number 2021/09/08/58549900/16/AM should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.

Kind regards,



Prof AT Motlhabane
CHAIRPERSON: CEDU RERC
motlhat@unisa.ac.za



Prof PM Sebate
EXECUTIVE DEAN
Sebatpm@unisa.ac.za

ANNEXURE C: PERMISSION TO CONDUCT RESEARCH USING UNISA STUDENTS AS RESPONDENTS: POSTGRADUATE DEGREES AND COMMERCIALISATION COMMITTEE (SRIPCC)



RESEARCH PERMISSION SUB-COMMITTEE (RPSC) OF THE SENATE RESEARCH, INNOVATION, POSTGRADUATE DEGREES AND COMMERCIALISATION COMMITTEE (SRIPCC)

4 November 2021

Decision: Permission approval 4
November 2021 to 31 December
2022

Ref #: 2021_RPSC_089
Ms. Andrea Bauling
Student #: 58549900
Employee #: 90186419

Principal Investigator:

Ms Andrea Bauling
Department of Jurisprudence
College of Law
baulia@unisa.ac.za; 0724337520

Supervisor: Dr Faiza Gani: ganif@unisa.ac.za; 0799219222
Prof Geesje van den Berg: vdberg@unisa.ac.za; 0829219771

STUDENTS' PERCEPTIONS OF THE VALUE OF INFOGRAPHICS AS LEARNING MATERIALS IN THE BACHELOR OF LAWS DEGREE

Your application regarding permission to involve Unisa staff, students and data in respect of the above study has been received and was considered by the Research Permission Subcommittee (RPSC) of the UNISA Senate, Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC) on 18 October 2021.

Approval for this study was granted on 3 November 2021 based on the review and approval of the memorandum submitted specifying the Unisa Teaching and Learning and ODL policies that you are requiring access to via Unisa e-connect.

You may invite all HFL1501 students registered for the 2021 academic year to participate in an online questionnaire that will be distributed with the gatekeeping assistance of ICT.



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You may access the following secondary data on students:

- Statistics from HFL1501-21-ALL myUnisa site;
- Number of students registered for HFL1501 in the 2021 academic year;
- The number of students actively participating on the HFL1501 myUnisa module site.

You may access the following secondary data from the Unisa e-connect on Unisa operations:

- Tuition policy;
- Open Distance e-Learning policy;
- Curriculum policy;
- Framework for the implementation of a team approach to curriculum and learning development at Unisa;
- Implementing the UNISA Curriculum.

The personal information made available to the researcher(s)/gatekeeper(s) will only be used for the advancement of this research project as indicated and for the purpose as described in this permission letter. The researcher(s)/gatekeeper(s) must take all appropriate precautionary measures to protect the personal information given to him/her/them in good faith and it must not be passed on to third parties. The dissemination of research instruments through the use of electronic mail should strictly be through blind copying, so as to protect the participants' right of privacy. The researcher hereby indemnifies UNISA from any claim or action arising from or due to the researcher's breach of his/her information protection obligations.

You are requested to submit a report of the study to the Research Permission Subcommittee (RPSC@unisa.ac.za) within 3 months of completion of the study.

Note: The reference number 2021_RPSC_089 should be clearly indicated on all forms of communication with the intended research participants and the Research Permission Subcommittee.

Kind regards,



Dr Retha Visagie – Deputy Chairperson



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ANNEXURE D: COVER LETTER OF QUESTIONNAIRE

Invitation to participate in an anonymous online questionnaire on the use of online visual learning materials in HFL1501

Dear Prospective participant,

You are invited to participate in a questionnaire conducted by Ms A Bauling, under the supervision of Dr F Gani (a senior lecturer in the Department of Language Education, Arts and Culture) and Prof G van den Berg (a professor in the Department of Curriculum and Instructional Studies), towards a Master of Education degree at the University of South Africa.

This questionnaire has been designed to study students' perception of the value of infographics as learning materials in the Bachelor of Laws degree. You were selected to participate in this questionnaire because you were registered for the HFL1501 module in 2021. By completing this questionnaire, you agree that the information you provide may be used for research purposes, including dissemination through peer-reviewed publications and conference proceedings. It is anticipated that the information we gain from this questionnaire will help us to determine whether students believe infographics in learning materials for law are useful in stimulating engagement with the learning materials. We are also interested in learning whether students think these infographics improved their ability to learn complex concepts contained in the study material.

You are under no obligation to complete the questionnaire and you can withdraw from the study prior to submitting the questionnaire. The questionnaire is developed to be anonymous, meaning that we will have no way of connecting the information that you provide to you personally. Consequently, you will not be able to withdraw from the study once you have clicked the submit button because of the anonymous nature of the questionnaire. If you choose to participate in this questionnaire it will take up no more than 5 to 10 minutes of your time. We advise you to select a period of 10 minutes of free time, in which you are not participating in any examination or assessment activity, not preparing for an upcoming assessment, or are not involved in any other academic activity.

You will not benefit from your participation as an individual, however, it is envisioned that the findings of this study may grant educators in law valuable information that will allow them to design more stimulating learning materials. We do not foresee that you

will experience any negative consequences by completing the questionnaire. The researcher undertakes to keep any information provided herein confidential, not to let it out of her possession, and to report on the findings from the perspective of the participating group and not from the perspective of an individual.

The records will be kept for five years for audit purposes, where after it will be permanently destroyed. Electronic records will be permanently deleted from the secure online storage facility used. You will not be reimbursed or receive any incentives for your participation in the questionnaire.

The research was reviewed and approved by the College of Education Research Ethics Committee (Ref: 2021/09/08/58549900/16/AM) and the Research Permission Sub-Committee (RPSC) of the Senate Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC) (Ref: 2021_RPSC_089). The primary researcher, Ms A Bauling, can be contacted at baulia@unisa.ac.za. The study leaders, Dr F Gani and Prof G van den Berg, can be contacted at ganif@unisa.ac.za or vdberg@unisa.ac.za. Should you have any questions regarding the ethical aspects of the study, you can contact the chairperson of the College of Education Research Ethics Committee, Prof Abraham Motlhabane, at motlhat@unisa.ac.za. Alternatively, you can report any serious unethical behaviour at the University's Toll-free Hotline 0800 86 96 93.

By continuing to and starting the questionnaire, you are indicating that you have read the information above and are willing to participate in this study. You are free to withdraw from the study at any time prior to clicking the submit button.

To participate in the questionnaire, please click on the following link:

https://unisa.qualtrics.com/jfe/form/SV_51DmxnEFdjwpedw