Accounting students access to social media related resources and the risk of tacit social exclusion

Stephen A. Coetzee , Karin Leith and Astrid Schmulian

Department of Accounting, University of Pretoria, Pretoria, South Africa

*Correspondence to: stephen.coetzee@up.ac.za

Abstract
The use of social media platforms to facilitate teaching and learning requires resources (hardware and Internet access) to enable active student participation. Limited access to these resources may impair students' learning and, should the students consequently fail to graduate, tacitly contribute to their social exclusion. The results of a survey amongst students at a South African university, identified statistically significant differences relating to hardware and Internet access between more affluent students, and lower income students. Using social media may, therefore, be countering the objective of widening the admissions to universities in South Africa as an attempt to address past exclusionary practices. This study raises awareness with instructors and administrators globally, about the risk of tacit social exclusion, as a result of the tools selected to facilitate learning.

Introduction

This study explores student access to the resources necessary to use social media and whether the use of social media, in teaching and learning, may tacitly reinforce the social exclusion of low-income students. Advances in technology, including social media, impacts every facet of life. Most students function every day in the social media environment. Skills and tools used in this environment and with which students are therefore familiar, can be harnessed for teaching and learning. Using these skills and tools, students can actively participate in creating knowledge by collaborating, networking and sharing with their peers (Buddle, 2014; Grover & Stewart, 2010; Gupta, 2015). Social media platforms provide a wide range of tools that students can use to suit their individual learning styles and improve their learning and academic success (Grover & Stewart, 2010).

However, the effectiveness of including social media in the facilitation of online instruction interventions, is dependent upon student access to the necessary hardware (computers, iPads, cell phones, smart phones, e-Readers) and the Internet. Limited or no access thereto by low-income students could impair their learning and possibly result in these students not successfully completing their education programmes. In the modern digital economy, it is crucial to ensure that all of today's students have equal access to digital technology (OECD, 2012). Researchers with an interest in equitable access to educa-

tional technology should, therefore, consider students' access to digital technology (Iivari, Molin-Juustila, & Kinnula, 2016). This is of particular importance in environments where socio-economic inequality exists.

Given South Africa's history of socially excluding Black Africans under Apartheid, one of the most effective apparatuses of social closure in history, failure to successfully complete an education programme may prevent Black Africans from overcoming this legacy of social exclusion (Coetzee, Schmulian, & Kotzé, 2014). Social exclusion refers to the extent 'that individuals, families and communities are able to fully participate in society and control their own destinies' (Warschauer, 2002, p. 4). The Black Africans, in general, continue to be significantly disadvantaged in terms of capital and property ownership and consequently continue to live in lower income urban and rural areas (Sartorius & Sartorius, 2013). Education is crucial to enabling Black Africans greater opportunity to accumulate capital and property and uplift their socio economic status in post-Apartheid South Africa (Hammond, Clayton, & Arnold, 2009). Much has, therefore, been done since the demise of Apartheid to expand university access to Black African students through, *inter alia*, the removal of the systemic and structural barriers of Apartheid, restructuring of secondary school curricula, and assessment and funding of low-income students' higher education primarily through state sponsored financial assistance. The South African university system has consequently more than doubled its student enrolment and significantly transformed its racial, cultural and class diversity (Mouton, 2014). However, many of these Black African first generation university students are not graduating, despite meeting the current entrance requirements (van Zyl, 2017). In 2015, 47.9% of university students did not complete their degrees. Black African student throughput for certificate and bachelor qualifications increased between 1950 and the mid-1980s. This increase began to reverse in the mid-1980s and is now lower than what was achieved in the 1950s (Gumede, 2017). Between 50% and 60% of students at South African universities drop out during their first year of study (van Zyl, 2017). Black African students had the highest drop-out rate, with in 2015, for example, 32.1% leaving in their first year (Gumede, 2017).

The high dropout rate has been attributed to factors characteristic of low-income students. These include inadequate preparation for higher education at school, family responsibilities and lack of emotional support and counselling from parents who were not allowed entrance to the universities on the basis of their race (Letseka & Maile, 2008). In addition to these factors, it is submitted that the teaching approach adopted in South African universities may contribute to the dropout rate. While South African universities have been widening their admission policies over the past two decades, these institutions have simultaneously increased the use of information and communication technologies in their teaching approaches (Mahesh, 2017). In particular, South African universities, including the university providing the background for this study (UP, 2018a), are increasingly adopting online or blended[1] teaching approaches that include digital and flexible learning mediums, such as mobile learning (Mahesh, 2017). It is submitted that these approaches have been necessitated by the significantly increased class sizes as a consequence of the wider admission policies. While student numbers have increased significantly, physical capacity has not increased accordingly. The effectiveness of online learning, is dependent upon student access to the necessary hardware and the Internet. Limited or no access thereto could impair student learning and possibly result in these

students failing to graduate and may tacitly contribute towards the continued social exclusion of Black Africans in South African society.

Contribution

The exploration in this paper may aid in assisting instructors, whose classes are characterised by large numbers of low-income students, in selecting pedagogical tools that do not impair students' learning as a consequence of their social class. Secondly, administrators may be better able to adopt inclusive teaching policies for their institutions that better align with their more inclusive admission policies. Alternatively, administrators may need to consider means of providing access to the resources and tools necessary to support students' learning in online learning environments. Stakeholders funding students may also find value in understanding that the students' needs for financial support may extend beyond the traditional tuition fees and textbooks to include the hardware and the Internet necessary to access social media. While South Africa is perhaps unique in the number of Black African first generation low-income students gaining access to higher education, the presence of first generation low-income students is a global phenomena. This study may raise awareness with instructors and administrators globally about the risk of tacit social exclusion as a result of the tools selected to facilitate learning. It is submitted that in South Africa, many teachers and administrators grew up in more affluent socio-economic circumstances. In 2015, 66% of all university professors in South Africa were from the White population group, despite less than 10% of South Africa's population being White (Ramoupi, 2017). In making decisions pertaining to their students' learning, these professor's decisions may be framed by their own more affluent socio-economic frame of reference and upbringing. Consequently, they may unintentionally exclude students from learning opportunities based on assumptions such as, 'all children these days have access to the internet'.

The exploration of unintended closure practices in the teaching of accounting contributes to the existing literature documenting more deliberate and intentional processes of professional closure through, inter alia, licencing and credentialing practices that result in exclusion from the accounting profession on the basis of race, class, ethnicity and gender (see Annisette, 2000; Annisette, 2003; Grey, 1998; Hammond et al., 2009; Hammond & Streeter, 1994; Kirkham & Loft, 1993; Sian, 2006, 2007a, 2007b).

Theoretical underpinning: social closure

Tacit social exclusion, as a result of the facilitation of learning via social media, may be understood and interpreted through the lens of Murphy's (1984, 1988) interpretation of Weber's (1946) theory of social closure. The theory of social closure originated with Max Weber and was his attempt to develop a framework that could be used to understand various forms of exclusion and social stratification that exist in society (Larkin, 1983; Larson, 1977). This exclusion may be based on formal or informal rules and practices, such as citizenship, education, language, ethnicity, gender, property, professional licencing or credentials, and race or religion (Larkin, 1983; Larson, 1977). The exclusion results in an individual or a group being excluded from opportunities, many with economic consequences (Larkin, 1983; Larson, 1977).

Parkin (1979), a neo-Weberian theorist who continued to develop Weber's social closure model, contended that the two primary means of exclusion in a modern capitalist society, are property ownership that limits access to the means and fruits of production, and academic or professional qualifications and credentials that restrict access to the key positions in the division of labour. Accordingly, both property ownership and education are more or less equal determinants of a high social status and class and privilege. Collins (1979), another neo-Weberian theorist, argued that wealth inequalities in a capitalistic society resulted from monopolistic restraints that affect labour mobility. This includes gender-based segregation of positions and barriers based on race, ethnicity, religion, social origin and school credentials, which result in wealth inequalities.

Murphy (1984, 1988) criticised these simplified rules and argued that some of the closure rules have primacy over other closure rules so that there is a hierarchy within different types of social closure. He suggested that

> the principal form of exclusion refers to the set of exclusion rules, backed by the legal (and hence ultimately military) apparatus of the state, which is the main determinant of access to or exclusion from power, resources, and opportunities in society. (Murphy, 1984, p. 555)

Drawing on this, Murphy suggested that the legal title to private property in a capitalist society is an example of a principal form of exclusion whilst credentials, like education, are derived from, or are contingent on, the principal form of exclusion, namely property ownership (Murphy, 1984, 1988). He argued that in South Africa, a dual exclusion structure existed, in that under Apartheid, exclusion rules applied to both property ownership and race, in that Black African people were prevented from accumulating capital and property and were therefore consigned to a low-income socio-economic status in South Africa (Murphy, 1984).

Despite the removal of the systemic and structural barriers of Apartheid that resulted in the social exclusion of Black Africans, White people in general continue to be advantaged by the accumulation of property and wealth during Apartheid (Hammond et al., 2009; Murphy, 1988). Consequently, many of the Black African first generation university students may have their efforts to overcome social exclusion undermined by their continued exclusion from capital and property ownership, albeit no longer on the basis of race, but their inherited social class (Hammond et al., 2009; Murphy, 1988).

While attempts have been made to sponsor low-income students' university admission, admission is only the starting point towards graduation and the attainment of the qualification necessary to overcome social exclusion. Support for low-income students during their studies is needed to assist them in graduating. Education is perhaps the only enduring and successful means, by which the social exclusion can be overcome (Butler & McAvoy, 2008). South African universities consequently offer various language, academic literacy and preparedness courses (UP, 2018b). However, success in these courses and the students' degree or certificate programme is fundamentally dependent on their access to the hardware and Internet necessary to access the social media that is used to facilitate their learning in online teaching environments. Digital technology either increases social exclusion or eases it (Trauth & Howcroft, 2006). If students are unable to access the means in which learning is facilitated, their chance of graduating and overcoming any social exclusion may be impaired.

This gives rise to the following two research questions, namely:

RQ1: Do undergraduate students have access to the resources necessary to use social media to facilitate online teaching interventions?

RQ2: Is there a risk of tacit social exclusion of some undergraduate students if social media is used to facilitate online teaching interventions?

Social media

Social media has been defined, inter alia, as web-based applications and tools that enable users to connect, create, share and exchange content or media (Correa, Hinsley, & de Zúñiga, 2010; Grover & Stewart, 2010; Junco, Heiberger, & Loken, 2011; Kaplan & Haenlein, 2010) in a social space (Rodriguez, 2011). Social media includes social networking sites (Towner & Klemz, 2016), whilst Instant messaging, either as a stand-alone feature on the Internet or as an embedded feature of social networking sites, is also included in the scope of social networking sites (Correa et al., 2010; Towner & Klemz, 2016).

More specifically, the following categories can be included in the social media offering: microblogs (e.g. Twitter, Tumblr, Yammer), social networks (e.g. Facebook, Google+), professional networks (e.g. LinkedIn), visual networks (e.g. Instagram, Pinterest), ephemeral media (e.g. SnapChat), video-sharing services (e.g. YouTube), video telephony (e.g. Skype, FaceTime), collaboration technologies (e.g. Google Docs, Quip, Wikis), discussion services (e.g. blogs, discussion threads), email and texting/short message service (sms) (Towner & Klemz, 2016).

Social media in teaching and learning

Social media is increasingly embraced in the facilitation of learning (Buddle, 2014; Gupta, 2015). This form of facilitation may improve student grades (Krasilnikov & Smirnova, 2017; Orús et al., 2016) as social media enables the sharing and generation of knowledge and content through increased student engagement and collaboration with peers (Biasutti, 2017; Sadowski, Pediaditis, & Townsend, 2017; Schoper & Hill, 2017) and instructors (Knight & Kaye, 2016). The use of social media in facilitating learning may even encourage participation by shy and introverted students (Luo & Gao, 2012). Social media extends the classroom beyond its physical space and time parameters (Henderson, Selwyn, & Aston, 2017; Schoper & Hill, 2017) enabling situated learning (Gikas & Grant, 2013) and learning to network in a professional environment (McCabe, 2017; Sloane & Gaffney, 2016) with external experts (Petersen & Dover, 2014) and members of a student's future professional community (McCorkle & McCorkle, 2012; West, Moore, & Barry, 2015).

While findings in favour of the use of social media in teaching and learning have been observed, a number of criticisms and concerns have also been raised with negative correlation between social media use and academic performance being reported in some instances (Kuznekoff & Titsworth, 2013; Lau, 2017). Students are disinclined to participate and contribute when their learning is facilitated by social media, unless their course grade is clearly linked to these activities (Graham, 2014; Towner & Klemz, 2016). Social media could be distractive (Bosch, 2009; Ivala & Gachago, 2012; Kuznekoff & Titsworth, 2013; Shirky, 2014) and stifle oral contributions in class (Elavsky, Mislan, & Elavsky, 2011). Multitasking by students, whilst using social media, had detrimental effects on their cognitive

abilities (Wang & Tchernev, 2012) as students 'used the social media applications as a "sponge" for accumulating more information with little or no effort on their own behalf' (Graham, 2014, p. 20). The students were, therefore, 'evolving from cultivators of personal knowledge into hunters and gatherers in the electronic data forest' (Carr, 2010, p. 6), and in the process 'skimming is becoming our dominant mode of thought' (Carr, 2010, p. 5). Privacy and Internet safety concerns are also noted (Sadowski et al., 2017). There is an increasing risk of student data collected by social media platforms (FBI, 2018) being used maliciously in, for example, social engineering, bullying, tracking, identity theft, or other means for targeting children.

Social media penetration in South Africa

In South Africa, 15 million people (27%) use social media platforms, accessed primarily on mobile phones (78%), which in many cases, is often the user's only available device (Qwerty Digital, 2017). The three most highly ranked social media platforms used in South Africa for the period 2016–2017 are Facebook (49%), YouTube (47%) and What-sapp (45%) (Figure 1) (Qwerty Digital, 2017).

Internet penetration, and by implication social messaging use, in South Africa, is dependent on disparities in income, with South Africans earning more than R30 000 per month having an Internet penetration of 82.4%, which is similar to that for many developed countries (Goldstuck, 2017). However, this Internet penetration rate declines rapidly as income declines, falling to below 30% for low income earners (Goldstuck, 2017). The cost of Internet access in South Africa is one of the highest in the world, and this has a significant impact on low-income users (Goldstuck, 2017). Internet access in South Africa is also affected by infrastructure differences between major metropolitan areas that have Internet access penetration levels of 67.7% compared to only 32.3% in the smaller cities and towns, whilst it is assumed that outside of the urban areas, Internet penetration would be significantly lower than this (Goldstuck, 2017).
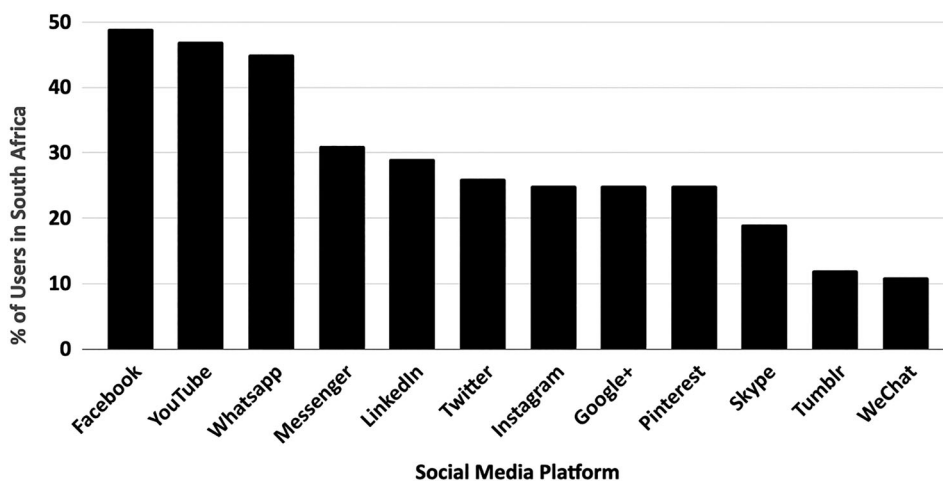

Figure 1. Most used social media platforms in South Africa 2016–2017.

Method

To explore the research questions (RQs), an anonymous survey instrument was used (available at https://goo.gl/9xF3aS), following approval by the Institutional Review Board (IRB) of the university for the research design and the survey instrument. The survey instrument used for this study is based on that developed to explore student access to social media offerings in the United States of America (Towner & Klemz, 2016). The survey instrument was modified to reflect the differing context of this study. In particular, additional demographic questions were included to reflect the South African context and to explore RQ 2. The survey instrument was pre-tested, resulting in minor clarification adjustments. Despite the perceived length of the questionnaire, 54 items in total, the pre-test participants reported no survey fatigue and were able to complete the survey in approximately 10 min. No respondent is required to complete all 54 items. The majority of the questions direct the respondent to respond only to the appropriate follow-up questions based on their response in the first instance (Figure 2). The pre-test participants were not included in the survey results.

In response to RQ 1, the survey instrument explored student access to hardware and the Internet. The students were asked to identify what hardware device(s) (e.g. laptop computer, smartphone) they have access to, be they the university's devices that are available on campus or privately owned. Further, they were asked what primary device they would use to access the Internet, if they did not have access to the university's devices on campus. Students were then asked to identify the nature of their Internet access (e.g. self-funded or free WiFi on the university campus) and also whether they would be able to access the Internet if the university's free WiFi was not available. Finally, an open-ended question asked students to give reasons for not having regular Internet access, if applicable.

In response to RQ 2, the students were asked to provide the name of the secondary school from which they exited. This information was used to determine the applicable quintile category of the school, using the Schools Masterlist Data.[2] The quintile categorisation of schools serves as a proxy for a student's socio-economic circumstances (Coetzee et al., 2014) which is dependent on the accumulation of capital or property (Murphy, 1988). In South Africa, the Department of Basic Education assigns a poverty score[3] to schools. This poverty score categorises schools into quintiles, based on the socio-economic status of the surrounding community in which the schools are situated. This score is used to allocate state funding to individual schools. Quintile 1–4 schools are typically schools in lower income Black African communities, while quintile 5 schools are typically schools in more privileged and wealthy former White communities. The use of a student's school quintile, rather than race, as a proxy for socio-economic

24. Do you use Social Networks (e.g., Facebook, Google+)? *
Mark only one oval.

◯ Yes   *Skip to question 25.*
◯ No   *Skip to question 26.*

Figure 2. Extract from the survey instrument.

circumstances, is necessary, given that while many Black Africans have not yet overcome the legacy of Apartheid, there are many who have. Inclusion of a variable for an individual's schooling environment, therefore, ensures greater classification refinement of students into socio-economic groups than when based on race (Coetzee et al., 2014). This variable captures the migration of some Black Africans into more privileged and wealthy former White communities (Coetzee et al., 2014).

The data collected from the student responses to the survey questions related to RQ 1 and 2 have been analysed descriptively and statistically significant differences between quintile 1–4 students and quintile 5 students have been explored using an analysis of variance (ANOVA).

Sample

To determine the minimum sample size for the survey, Lin and Schaeffer's (1995) procedure based on Neyman/Pearson estimation with confidence intervals was adopted. This procedure requires the estimation for a finite population size ($n = 35\ 201$) (UP, 2015), the desired margin of error (0.1 (Sivo, Saunders, Chang, & Jiang, 2006)) and the population variance (1 (Sivo et al., 2006)) and resulted in a minimum sample required of 396 students.

First year accounting classes ($n = 1\ 952$ students) were selected for the distribution of the survey. These students represent a broad cohort of the university student body, as first year accounting modules are widely prescribed across several degree programmes offered by the university. Additionally, it is during the first year of study that the greatest dropout of students occurs (van Zyl, 2017) and surveying students in later years of study may risk ignoring the responses of students that have already been excluded after the first year of study. To maximise the response rate, the survey was distributed to all students present at the beginning of class, rather than per email or postal mail. Consequently, 854 students participated in the survey, significantly exceeding the minimum sample size needed ($n = 396$). The participation by the students was voluntary, not for reward, and no identifying information was collected.

The majority of the respondent students are female (56%; $n = 474$) and from the White population group (54%; $n = 463$) (Table 1), which closely aligns with that of the student population as a whole at the university explored in this study (Table 1). Of the 854 survey respondents, the majority of the students (83%; $n = 710$) exited from quintile 5 public or private secondary schools, whilst 17% ($n = 144$) of the students exited from quintile 1–4 public secondary schools. Of these 144 students, 80% ($n = 115$) are Black African students, whilst 17% ($n = 24$) of this group are White students.

Results and discussion

Access to hardware

The majority of students have access to a laptop computer (93%; $n = 795$) or a smartphone (98%; $n = 833$) (Figure 3) (RQ 1). 77% ($n = 659$) of the students responded that they have access to a desktop computer. All students, when on campus, should have access to desktop computers in the computer laboratories on the university campus. This result

Table 1. Demographic profile of survey respondents.

	Number of students	% o f students	Student demographics for the university explored in this study (%)
Gender	854	100	100[a]
Female	474	56	58
Male	380	44	42
Race[b]	854	100	100[c]
Black African	327	38	42
White	463	54	50
Other[d]	64	8	8
Age	854	100	
18 years	210	25	
19 years	441	52	
20 years	133	16	
Older than 20 years	70	7	
School quintiles	854	100	
Quintile 1–4	144	17	
Quintile 5 (includes private schools)	710	83	

[a]University of Pretoria Statistics at a Glance, 2014.
[b]Statistics South Africa asks people to describe themselves in terms of four population groups namely: Black African, Coloured, Indian/Asian and White (StatsSA, 2018).
[c]University of Pretoria Annual Review, 2015.
[d]Other racial groups include Asian, Indian and Mixed-race (referred to as Coloured) students. The mixed-race student cohort originate from at least five different paternal populations (Khoisan, Bantus, Europeans, Indians and Southeast Asians) with more than 60% of their maternal contribution being Khoisan (Quintana-Murci et al., 2010).
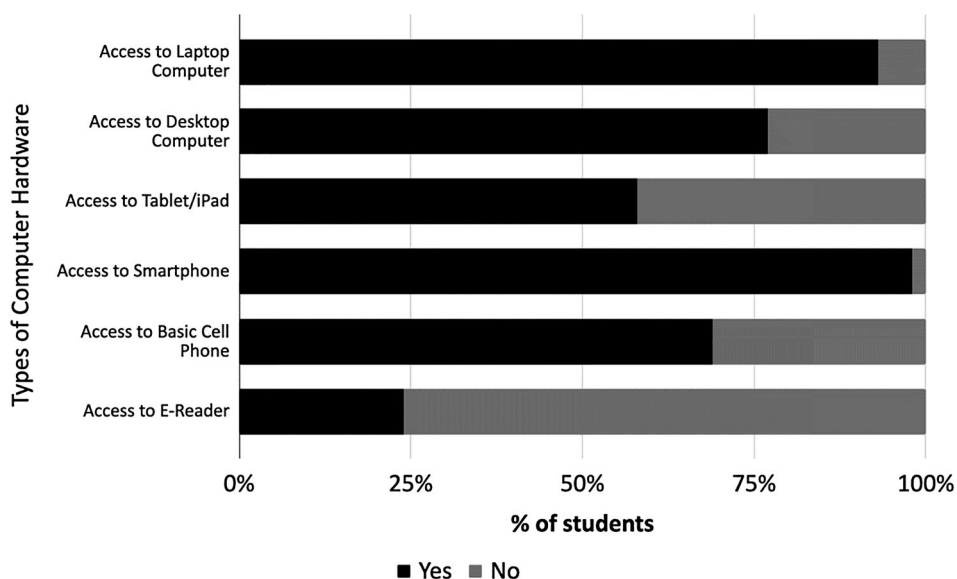

Figure 3. Student access to hardware for all survey respondents *(percentages are not mutually exclusive)*.

may suggest that there may be insufficient computers on the university campus, to service the student population. The current student to computer ratio of the targeted university is approximately 10:1 (UP, 2017).

To further explore student access to hardware, differences between quintile 1–4 students' and quintile 5 students' access to hardware were explored and several statistically

significant differences identified (RQ 2). Proportionally more of the affluent quintile 5 students, than the lower income quintile 1–4 students, have access to a laptop computer ($F = 30.402$; $p = 0.000$), a tablet/iPad ($F = 25.547$; $p = 0.000$), a smartphone ($F = 19.779$; $p = 0.000$) and an e-Reader ($F = 2.733$; $p = 0.099$) (Figure 4). In contrast, proportionally more quintile 1–4 students (76%; $n = 109$) than quintile 5 students (55%; $n = 389$) have access to a basic, and cheaper, cell phone with only texting and calling capabilities ($F = 7.187$; $p = 0.007$). A basic cell phone with limited texting and calling capabilities would, however, not enable access to the Internet.

During an academic year students may, at times, be required to work independently off campus. In these situations, students would need to have access to hardware off campus (RQ 1). For both quintile 1–4 and quintile 5 students, the two highest ranked primary devices that students would use to access the Internet when off campus, are a smartphone (50%, $n = 424$) and a laptop computer (39%, $n = 335$) (untabulated).

A statistically significant difference ($F = 14.627$; $p = 0.000$) between the primary devices that the lower income quintile 1–4 students and the more affluent quintile 5 students would use to access the Internet under these circumstances, is evident (RQ 2). Proportionally more quintile 1–4 students (59%; $n = 85$) would use a smartphone to access the Internet than quintile 5 students (48%; $n = 339$). In contrast, proportionally more quintile 5 students (42%; $n = 299$) would use a laptop computer to access the Internet than quintile 1–4 students (25%; $n = 36$) (Figure 5). This may be related to the affordability of these devices (Deloitte, 2017).

There are 6 (4%) quintile 1–4 students who do not have access to a suitable device with which to access the Internet, if they do not have access to the university's hardware on campus. Analysis of these students' socio-economic backgrounds revealed that they reside either in rural areas, small towns or other developing African countries. Inexplicably, there are also 10 (1%) quintile 5 South African students from developed urban areas who do not have access to a suitable device with which to access the Internet, if they do not have access to the university's hardware on campus (Figure 5). This is
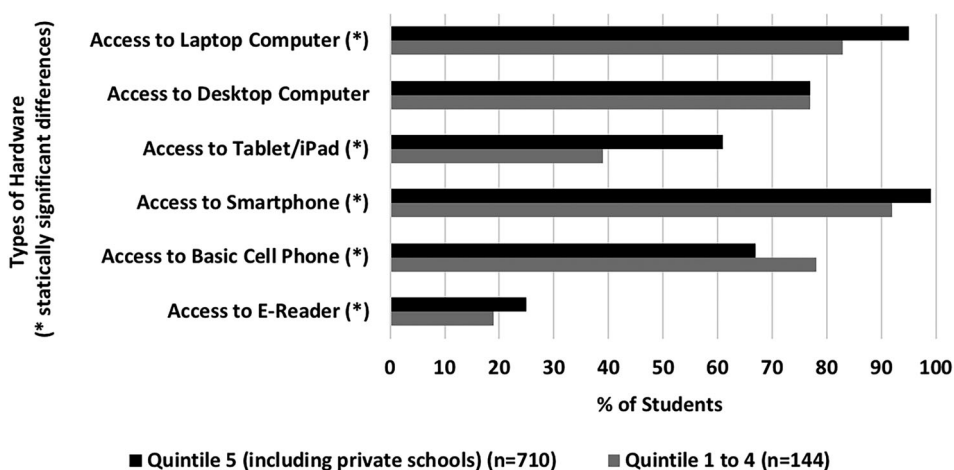

Figure 4. Student access to hardware for all survey respondents according to school quintile *(percentages are not mutually exclusive)*.
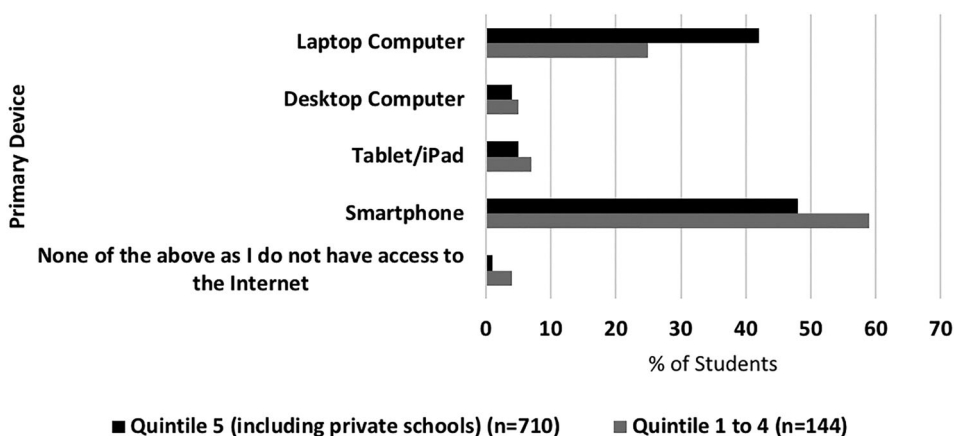
Figure 5. Primary device used by students to access the Internet if no access to university campus, according to school quintile *(percentages are mutually exclusive)*.

perhaps indicative that inclusion, such as having access to resources, is not something that can necessarily always be forced upon people. On occasion people may need to exercise their free choice (Andrade & Doolin, 2016) to have access to the necessary hardware.

Access to the internet

Almost all of the students acknowledge that they have Internet access via the free WiFi on campus (99%; $n = 845$) and, where applicable, in the university residences (55%, $n = 469$) (Figure 6) (RQ 1). In addition, many students have other Internet access (80%; $n = 679$) that is not self-funded. Further, 52% ($n = 445$) of the students have free Internet access at Internet hubs other than at the university (using their own devices) (Figure 6).
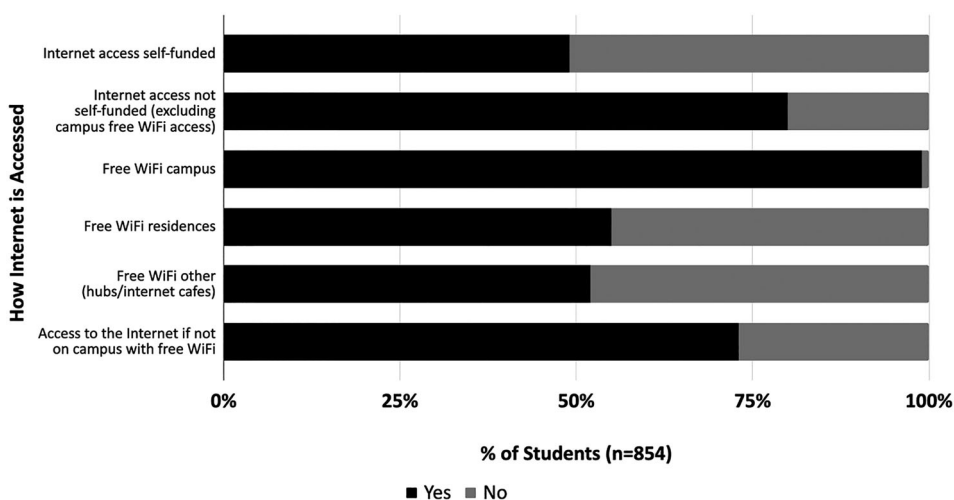

Figure 6. Student access to the internet for all survey respondents *(percentages are not mutually exclusive)*.

The majority of students (73%; $n = 620$) have Internet access even if they are not on the campus. However, 27% ($n = 234$) of the students indicated they do not have Internet access off campus.

To further explore student access to the Internet (RQ 2), a comparison between the lower income quintile 1–4 students' and the more affluent quintile 5 students' Internet access identified several statistically significant differences.

More quintile 5 students (76%; $n = 540$) than quintile 1–4 students (56%; $n = 80$) would have Internet access even if they were not on the university campus or in the university residences ($F = 26.005$; $p = 0.000$) (Figure 7). This may be attributed to the differences in the socio-economic environments of the students. Although many quintile 1–4 students have access to Internet enabled devices (Figure 6), which, it is submitted, is a once-off cost, their financial constraints may prohibit the continual purchase of data to access the Internet. This is compounded by the fact that South Africa has one of the highest data costs in the world (Goldstuck, 2017). Substantially more quintile 5 students (85%; $n = 606$) have access to the Internet that is not self-funded compared to quintile 1–4 students (51%; $n = 73$) ($F = 98.204$; $p = 0.000$). The challenges for quintile 1–4 students to access the Internet are highlighted in their response to the open-ended question that asked students to give reasons for not having regular Internet access. Typical responses from quintile 1–4 students include:

"I do not have enough money to buy [data]",

"[data] is expensive and where I reside, there is no free WiFi", and

"the money that I receive from my parents is not enough to have access to the Internet for the full month, and where I reside, there aren't any free [WiFi]".

Although appearing to be less restrictive on the more affluent quintile 5 students' access to the Internet, similar sentiments pertaining to high data costs were expressed by these students.
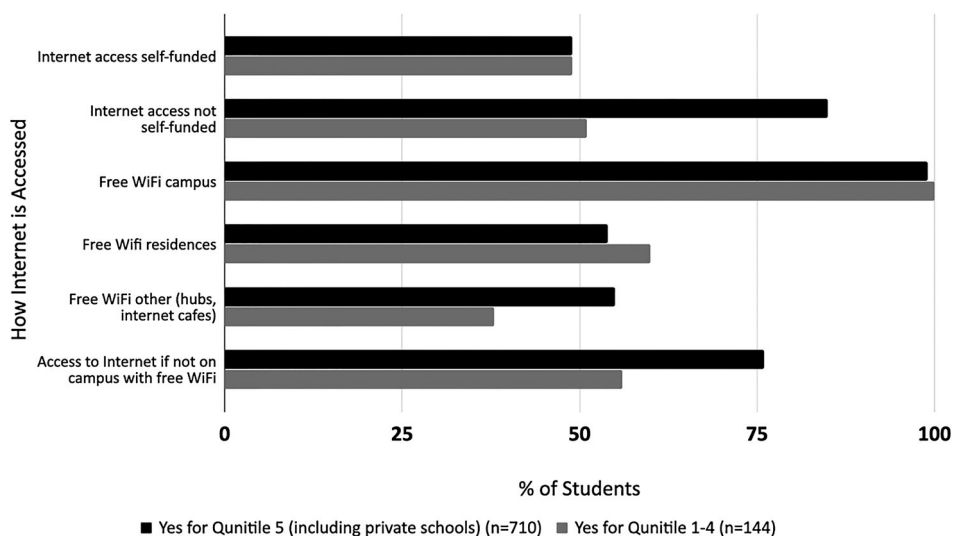

Figure 7. Student access to the internet according to school quintile *(percentages are mutually exclusive).*

More quintile 5 students (55%; $n = 390$) are also able to access the Internet via the free WiFi at Internet hubs outside of the university (using their own devices), than quintile 1–4 students (38%; $n = 55$) ($F = 13.618$; $p = 0.000$). This disparity may be attributed to the Internet infrastructure imbalance between South Africa's more affluent major metropolitan areas, where more Internet hubs are located than in smaller cities, towns and lower income rural areas. A respondent student commented:

> I live in a rural area and the signal work[s] only 20% of the time.

Other reasons provided by students for being unable to access the Internet were the lack of Internet stability and the slowness of the Internet both on and off the university campus. Students accommodated in the university residences also highlighted that whilst free WiFi may be available in these residences, this can only be accessed on their residence house floors or in the recreation halls and not in their individual rooms, where most of their studying and preparation would take place.

While the majority of students have access to a device that is Internet-enabled and can use that device to access the Internet (90%; $n = 766$), 10% ($n = 88$) of the students indicated that if they are unable to access the Internet on the university campus, they will not be able to access the Internet (untabulated), even though the majority of these students may have access to a suitable device. A statistically significant difference ($F = 15.910$; $p = 0.000$) was revealed when this was explored further and quintile 1–4 students were compared to quintile 5 students. Proportionally less quintile 5 students (9%; $n = 60$) than quintile 1–4 students (19%; $n = 28$) would not have access to the Internet if they were unable to access the Internet on the university campus.

Discussion and implications

The results of this study suggest that, given their lower social-economic status and limited ability to accumulate capital and property, some quintile 1–4 students do not have access to the hardware and the Internet (RQ 1) necessary for the targeted university's 'hybrid' (or blended) teaching approach (UP, 2018a).

Therefore, while the removal of the systemic and structural barriers of Apartheid has created the opportunity for Black Africans to overcome their historical social exclusion, through education (Hammond et al., 2009; Murphy, 1988), many of the Black African students from quintile 1–4 schools may have their education impaired by their inherited social class (Hammond et al., 2009; Murphy, 1988). The use of digital technology in the targeted university may be increasing the social exclusion (Trauth & Howcroft, 2006) of some quintile 1–4 students, as these students may be unable to access the means in which learning is facilitated (RQ 2).

Where a higher education institution has already implemented or is considering the implementation of online instruction, facilitated by the use of social media, care needs to be taken to ensure that all students are adequately resourced, particularly when prescribing off-campus work. While this paper offers evidence of an association between socio-economic status and access to the necessary hardware and the Internet, policy makers should consider each individual student's specific circumstances rather than a generalisation based on socio-economic status. When students responded to the open ended question related to not having regular Internet access, some quintile 5 students also responded,

inter alia, that 'data is expensive and the signal is not always strong enough', '[I] don't always have access due to finances', 'I do not live on campus and data is expensive' and 'I have a limited budget for data and that is what I use to go online if I am off campus'.

Additionally, instructors need to be cognisant of the resources that are at their students' disposal when designing their teaching, to optimise their students' learning with the resources they have access to. Whilst the majority of students have access to a smartphone, quintile 1–4 students are particularly reliant on this device to access the Internet if there is no access to the university campus or residences, confirming similar observations in the literature (Tsetsi & Rains, 2017). Smartphone-only access to the Internet, however, has important implications for teaching and learning. It has been cautioned that 'mobile Internet access represents an inferior form of access on a number of fronts – content availability, platform and network openness, speed, memory, and interface functionality among other things' (Napoli & Obar, 2014, p. 330). These 'disparities detrimentally affect users' abilities to engage in information seeking and content creation, and to develop a wide range of digital skills' (Napoli & Obar, 2014, p. 330). Whilst it is conceded that smartphone Internet access allows individuals who may not previously have had Internet access, onto the Internet, 'the differences between mobile and PC-based forms of Internet access can reinforce, and perhaps even exacerbate, inequities in digital skill sets, online participation, and content creation. Consequently, mobile-only Internet users become, in many ways, second-class citizens online' (Napoli & Obar, 2014, p. 330). This 'actually masks inequality by providing a limited form of Internet access that is often not distinguished from other, richer forms of Internet access such as broadband connectivity and multimodal access' (Tsetsi & Rains, 2017, p. 251).

Conclusion, limitations and future research

The use of social media platforms in teaching and learning facilitates the cognitive development of students through social interactions and collaboration. Students, however, require the necessary resources (hardware and Internet access) to be able to actively participate in teaching and learning that is facilitated through social media. In addition to exploring the students' access to hardware and the Internet, this study also explored the risk of tacit social exclusion of some students, if social media is used to facilitate online learning. To explore students' access and the risk of tacit social exclusion, an anonymous survey was conducted amongst undergraduate students at a South African university.

South Africa has a history of social exclusion of Black Africans on the basis of race and property ownership (Murphy, 1984). While the systemic and structural barriers of Apartheid were removed more than 20 years ago, the legacy of social exclusion remains. Many Black Africans continue to be socially excluded, albeit no longer on the basis of race, but on social class and their continued inability to accumulate capital or property. Education is seen as important in enabling Black Africans overcome this exclusion and consequently university admission has been broadened by financially enabling, with state and other sponsorship, low-income students to gain admission.

Unfortunately, the increased admission of low-income students has coincided with increased dropout rates, particularly in the first year of study. It has been acknowledged that these students require additional support to successfully complete their studies in order to enable them to overcome any social exclusion. While broadening admission,

South African universities have simultaneously adopted online forms of facilitating learning. This paper questions whether the resultant use of social media in teaching and learning may counter the goals of broadening university access. Students who do not have access to the necessary hardware and the Internet, to access social media, may have their learning impaired. Consequently, when viewed through the lens of Murphy's (1984, 1988) interpretation of Weber's (1946) theory of social closure, the use of social media in an online learning environment, impairing student learning, may tacitly contribute to the social exclusion of students in environments of socio-economic inequality, including low-income Black African students in South Africa.

Policy makers and instructors at higher education institutions need to note that smartphone-based access may offer inferior internet access to computer-based internet access and could impair the smartphone users' learning experience. Therefore, when choosing a social media platform to facilitate learning, policy makers and instructors need to consider the learning experience on a smartphone, to ensure that all students, regardless of the primary device they use, are able to participate equally.

Further, in selecting a social media platform to facilitate online instruction interventions, instructors should be cognisant of the possibility that the undergraduate student cohort are not a homogenous group in terms of digital literacy skills (Ainley, Schulz, & Fraillon, 2016; Akçayir, Dündar, & Akçayir, 2016; Bellini, Isoni Filho, de Moura Junior, & de Faria Pereira, 2016). Social exclusion is not only dependent on access to social media but also its meaningful use. This paper does not consider the digital literacy skills of the students. Future research could explore the association between the meaningful use by students of social media in teaching and learning and their risk of tacit social exclusion.

In interpreting and generalising the results, discussion and the conclusions drawn in this paper, it should be noted that, although many students responded to the survey, the risk of non-response bias remains and that these students were from a single site, albeit South Africa's largest residential university. Replication of this study is encouraged in other sites that are also characterised by socio-economic differences. Further, due to the number of questions in the survey, the possibility of survey fatigue could exist and this should be taken into account when interpreting the results. Finally, this paper did not specifically explore the students' reasons for their selection of, or access to, types of hardware. Future qualitative exploration of these reasons may assist stakeholders overcome the barriers of the students not having hardware when accessing social media for teaching and learning.

Notes

1. A blended teaching and learning approach has been defined as one in which classroom-based instruction interventions are deliberately combined with online instruction interventions to encourage and support learning (Asarta & Schmidt, 2017; Broadbent, 2017; Boelens, Van Laer, De Wever, & Elen, 2015).
2. The Schools Masterlist Data was obtained from the Department of Basic Education (of South Africa) and is dated Quarter 2 of 2016 (September 2016), retrieved on 11 September 2017 from www.education.gov.za/Programmes/EMIS/EMISDownloads.aspx.
3. The poverty score is calculated with reference to the average household income dependency ratio (or unemployment rate) and the level of education (or literacy rate) of the community (HSRC, 2009). This poverty score is used to allocate government funding to schools in terms of the South African Schools Act (84/1996).

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Ainley, J., Schulz, W., & Fraillon, J. (2016). *A global measure of digital and ICT literacy skills*. Retrieved from research.acer.edu.au/ict_literacy/12

Akçayir, M., Dündar, H., & Akçayir, G. (2016). What makes you a digital native? Is it enough to be born after 1980? *Computers in Human Behavior*, *60*, 435–440.

Andrade, A. D., & Doolin, B. (2016). Information and communication technology and the social inclusion of refugees. *MIS Quarterly*, *40*(2), 405–416.

Annisette, M. (2000). Imperialism and the professions: The education and certification of accountants in Trinidad & Tobago. *Accounting, Organizations and Society*, *25*, 631–659.

Annisette, M. (2003). The colour of accountancy: Examining the salience of race in a professionalisation project. *Accounting, Organizations and Society*, *28*, 639–674.

Asarta, C. J., & Schmidt, J. R. (2017). Comparing student performance in blended and traditional courses: Does prior academic achievement matter? *Internet and Higher Education*, *32*, 29–38.

Bellini, C. G. P., Isoni Filho, M. M., de Moura Junior, P. J., & de Faria Pereira, R. D. C. (2016). Self-efficacy and anxiety of digital natives in face of compulsory computer-mediated tasks: A study about digital capabilities and limitations. *Computers in Human Behavior*, *59*, 49–57.

Biasutti, M. (2017). A comparative analysis of forums and wikis as tools for online collaborative learning. *Computers & Education*, *111*, 158–171.

Boelens, R., Van Laer, S., De Wever, B., & Elen, J. (2015). Blended learning in adult education: Towards a definition of blended learning. Retrieved from www.iwt-alo.be/wp-content/uploads/2015/08/01-Project-report-Blended-learning-in-adult-education-towards-a-definition-of-blended-learning.pdf

Bosch, T. E. (2009). Using online social networking for teaching and learning: Facebook use at the university of Cape Town. *South African Journal for Communication Theory and Research*, *35*(2), 185–200.

Broadbent, J. (2017). Comparing online and blended learner's self-regulated learning strategies and academic performance. *Internet and Higher Education*, *33*, 24–32.

Buddle, C. (2014). *The value of using social media tools in teaching and learning*. Retrieved from teachingblog.mcgill.ca/2014/09/16/the-value-of-using-social-media-tools-in-teaching-and-learning/.

Butler, T., & McAvoy, J. (2008). Social inclusion and IT education: An institutional analysis. In *Proceedings of International Conference on information Systems ICIS 2008*, 70.

Carr, N. (2010). *The web shatters focus, rewires brains*. Retrieved from https://www.wired.com/2010/05/ff-nicholas-carr/

Coetzee, S. A., Schmulian, A., & Kotzé, L. (2014). Communication apprehension of South African accounting students: The effect of culture and language. *Issues in Accounting Education*, *29*(4), 505–525.

Collins, R. (1979). *The credential society: An historical sociology of education and stratification*. New York, USA: Academic Press.

Correa, T., Hinsley, A. W., & de Zúñiga, H. G. (2010). Who interacts on the Web? The intersection of users' personality and social media use. *Computers in Human Behaviour*, *26*, 247–253.

Deloitte. (2017). Global Mobile Consumer Survey 2017. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/za/ Documents/technology-media-telecommunications/ZA-Deloitte-South-Africa-Mobile-Consumer-Survey-2017-Mobile_090718.pdf

Elavsky, C. M., Mislan, C., & Elavsky, S. (2011). When talking less is more: Exploring outcomes of Twitter usage in the large lecture hall. *Learning, Media and Technology*, *36*(3), 215–233.

Federal Bureau of Investigation (FBI). (2018). Alert Number I-091318-PSA Education technologies: data collection and unsecured systems could pose risks to students. September. Retrieved from https://www.ic3.gov/media/ 2018/180913.aspx

Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cell phones, smartphones & social media. *Internet and Higher Education*, *19*, 8–26.

Goldstuck, A. (2017). Media future: Internet access in South Africa has many divides. *Media Future*. Retrieved from www.marklives.com/2017/09/media-future-internet-access-in-south-africa-has-many-divides/

Graham, M. (2014). Social media as a tool for increased student participation and engagement outside the classroom in higher education. *Journal of Perspectives in Applied Academic Practice*, *2*(3), 16–24.

Grey, C. (1998). On being a professional in a "Big Six" firm. Accounting. *Organizations and Society*, *23*, 569–587.

Grover, A., & Stewart, D. W. (2010). Defining interactive social media in an educational context. In C. Wankel, M. Marovich, & J. Stanaityte (Eds.), *Cutting edge social media approaches to business education: Teaching with LinkedIn, Facebook, Twitter, second life and blogs* (pp. 7–38). Charlotte, NC: Information Age Publishing.

Gumede, M. (2017). Universities put focus on high dropout rate. *Business Day*. 28 March. Retrieved from https://www.businesslive.co.za /bd/national/education/2017-03-28-universities-put-focus-on-high-drop-out-rate/

Gupta, P. (2015). *Importance of Social Media in Higher Education*. Retrieved from edtechreview.in/ trends-insights/insights/2041-social-media-in-higher-education.

Hammond, T., Clayton, B. M., & Arnold, P. J. (2009). South Africa's transition from apartheid: The role of professional closure in the experiences of black chartered accountants. *Accounting, Organizations and Society*, *34*(6), 705–721.

Hammond, T., & Streeter, D. (1994). Overcoming barriers: Early African – American certified public accountants. *Accounting, Organizations and Society*, *19*, 271–288.

Henderson, M., Selwyn, N., & Aston, R. (2017). What works and why? Student perceptions of 'useful' digital technology in university teaching and learning. *Studies in Higher Education*, *42* (8), 1567–1579.

Human Science Research Council (HSRC). (2009). School money funding the flaws. Retrieved from http://www.hsrc.ac.za/en/review/november-2009/school-money

Iivari, N., Molin-Juustila, T., & Kinnula, M. (2016). The future digital innovators: Empowering the young generation with digital fabrication and making. In *Proceedings of International Conference on information Systems* (ICIS) 2016.

Ivala, E., & Gachago, D. (2012). Social media for enhancing student engagement: The use of Facebook and Blogs at a University of Technology. *South African Journal of Higher Education*, *26*(1), 152–166.

Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, *27*, 119–132.

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizons*, *53*, 59–68.

Kirkham, L. M., & Loft, A. (1993). Gender and the construction of the professional accountant. *Accounting, Organizations and Society*, *18*, 507–558.

Knight, C. G., & Kaye, L. K. (2016). 'To tweet or not to tweet?' A comparison of academics' and students' usage of Twitter in academic contexts. *Innovations in Education and Teaching International*, *53*(2), 145–155.

Krasilnikov, A., & Smirnova, A. (2017). Online social adaption of first-year students and their academic performance. *Computers & Education*, *113*, 327–338.

Kuznekoff, J. H., & Titsworth, T. (2013). The impact of mobile phone usage on student learning. *Communication Education*, *62*(3), 233–252.

Larkin, G. (1983). *Occupational monopoly and modern medicine*. London, UK: Taylor & Francis.

Larson, M. (1977). *The rise of professionalism. A sociological analysis*. Berkley, CA: University of California Press.

Lau, W. W. F. (2017). Effects of social media usage and social media multitasking on the academic performance of university students. *Computers in Human Behavior*, *68*, 286–291.

Letseka, M., & Maile, S. (2008). *High university dropout rates: A threat to South Africa's future*. Pretoria, RSA: Human Science Research Council.

Lin, I.-F., & Schaeffer, N. C. (1995). Using survey participants to estimate the impact of non-participation. *Public Opinion Quarterly*, *59*(2), 236–258.

Luo, T., & Gao, F. (2012). Enhancing classroom learning experience by providing structures to microblogging-based activities. *Journal of Information Technology Education: Innovations in Practice*, *11*, 199–211.

Mahesh, K. (2017). Blended learning is the future. *Mail & Guardian*. 17 March. Retrieved from https://mg.co.za/article/2017-03-17-00-blended-learning-is-the-future

McCabe, M. B. (2017). Social media marketing strategies for career advancement: An analysis of LinkedIn. *Journal of Business and Behavioral Sciences*, *29*(1), 85–98.

McCorkle, D. E., & McCorkle, Y. L. (2012). Using LinkedIn in the marketing classroom: Exploratory insights and recommendations for teaching social media/networking. *Marketing Education Review*, *22*(2), 157–166.

Mouton, J. (2014). 'South African Higher Education in the 20th Year of Democracy: Context, Achievements and Key Challenges, *HESA presentation to the Portfolio Committee on Higher Education and Training*, 22 August.

Murphy, R. (1984). The structure of closure: A critique and the development of the theories of Weber, Collins and Parkin. *The British Journal of Sociology*, *35*(4), 547–567.

Murphy, R. (1988). *Social closure: The theory of monopolization and exclusion*. London, UK: Oxford University Press.

Napoli, P. M., & Obar, J. A. (2014). The emerging mobile internet underclass: A critique of mobile internet access. *The Information Society*, *30*(5), 323–334.

Organisation for Economic Co-operation and Development (OECD). (2012). *Connected minds: Technology and today's learners*. Paris, France: Educational Research and Innovation: OECD Publishing.

Orús, C., Barlés, M. J., Blanche, D., Casaló, L., Fraj, E., & Gurrea, R. (2016). The effects of learner-generated videos for YouTube on learning outcomes and satisfaction. *Computers in Education*, *95*, 254–269.

Parkin, F. (1979). *Marxism and class theory: A Bourgeois Critique*. New York: Columbia University Press.

Petersen, R. M., & Dover, H. F. (2014). Building student networks with LinkedIn: The potential for connections, internships, and jobs. *Marketing Education Review*, *24*(1), 15–20.

Quintana-Murci, L., Harmant, C., Quach, H., Balanovsky, O., Zaporozhchenko, V., Bormans, C., … Behar, D. M. (2010). Strong maternal Khoisan contribution to the South African coloured population: A case of gender-biased admixture. *The American Journal of Human Genetics*, *86*(4), 611–620.

Qwerty Digital. (2017). *Digital statistics in South Africa* 2017. Retrieved from https://www.qwertydigital.co.za/wp-content/uploads/2017/08/Digital-Statistics-in-South-Africa-2017-Report.pdf

Ramoupi, N. L. L. (2017). *Why are there so few black professors?* Retrieved from https://mg.co.za/article/2017-06-15-00-why-are-there-so-few-black-professors

Rodriguez, J. E. (2011). Social media in higher education: Key areas to consider for educators. *Journal of Online Learning and Teaching*, *7*(4), 539–550.

Sadowski, C., Pediaditis, M., & Townsend, R. (2017). University students' perceptions of social networking sites (SNSs) in their educational experiences at a regional Australian university. *Australasian Journal of Educational Technology*, *33*(5), 77–90.

Sartorius, K., & Sartorius, B. (2013). The comparative performance of chartered accountancy students in South Africa: The impact of historical legacies. *Development in Southern Africa*, *30*(3), 401–416.

The Schools Masterlist Data. (2016). Retrieved from www.education.gov.za/Programmes/EMIS/EMISDownloads.aspx

Schoper, S. E., & Hill, A. R. (2017). Using Facebook to promote learning: A case study. *Journal of Learning Spaces*, 6(1), 34–39.

Shirky, C. (2014). *Why I just asked my students to put their laptops away*. Retrieved from medium.com/@shirky/why-i-just-asked-my-students-to-put-their-laptops-away-7f5f7c50f368

Sian, S. (2006). Inclusion, exclusion and control: The case of the Kenyan accounting professionalisation project. *Accounting, Organizations and Society*, 31(3), 295–322.

Sian, S. (2007a). Reversing exclusion: The Africanisation of accountancy in Kenya, 1963–1970. *Critical Perspectives on Accounting*, 18, 831–872.

Sian, S. (2007b). Patterns of prejudice: Social exclusion and racial demarcation in professional accountancy in Kenya. *Accounting Historians Journal*, 34(2), 1–42.

Sivo, S. A., Saunders, C., Chang, Q., & Jiang, J. J. (2006). How low should you go? Low response rates and the validity of inference in IS questionnaire research. *Journal of the Association for Information Systems*, 7(6), 351–414.

Sloane, A. R., & Gaffney, A. L. H. (2016). Assessing students' use of LinkedIn in a business and professional communication course. *Communication Teacher*, 30(4), 206–214.

Statistics South Africa (StatsSA). (2018). *Mid-year population estimates*. Retrieved from http://www.statssa.gov.za/publications/P0302/P0302 2018.pdf

Towner, E. B., & Klemz, B. R. (2016). Social media in business and professional communication courses: A survey of student preferences. *Business and Professional Communication Quarterly*, 79(3), 331–347.

Trauth, E. M., & Howcroft, D. (2006). Social inclusion and the information systems field: Why now? In E. M. Trauth, D. Howcroft, T. Butler, B. Fitzgerald, & J. I. DeGross (Eds.), *Social inclusion: Societal and organizational implications for information systems*. IFIP International Federation for information Processing, 208, 3–12. Boston, USA: Springer.

Tsetsi, E., & Rains, S. A. (2017). Smartphone Internet access and use: Extending the digital divide and usage gap. *Mobile Media & Communication*, 5(3), 239–255.

University of Pretoria (UP). (2014). *Statistics at a glance* 2014. Retrieved from www.up.ac.za/media/shared/371/ZP_Files/dipbook_2015.zp43519.pdf

University of Pretoria (UP). (2015). *Annual Review* 2015. Retrieved from www.up.ac.za/media/shared/520/Publications/2016/3771-ww-up-annual-review-nov16.zp104776.pdf

University of Pretoria (UP). (2017). *IT Labs*. Retrieved from www.up.ac.za/it-labs

University of Pretoria (UP). (2018a). *Hybrid Learning*. Retrieved from https://www.up.ac.za/en/hybrid-learning

University of Pretoria (UP). (2018b). *Unit for Academic Literacy*. Retrieved from https://www.up.ac.za/unit-for-academic-literacy

van Zyl, A. (2017). *The first year experience in higher education in South Africa: A good practices guide*. Retrieved from http://www.sanrc.co.za/FYEGoodPracticesGuide2.pdf

Wang, Z., & Tchernev, J. M. (2012). The 'myth' of media multitasking: Reciprocal dynamics of media multitasking, personal needs, and gratifications. *Journal of Communication*, 62(3), 493–513.

Warschauer, M. (2002). *Reconceptualizing the digital divide*. Retrieved from https://firstmonday.org/article/view/967/888/

Weber, M. (1946). From Max Weber: *Essays in Sociology*, translated and edited by HH Gerth and CW Mills. Routledge, New York, USA.

West, B., Moore, H., & Barry, B. (2015). Beyond the Tweet: Using Twitter to enhance student engagement, learning, and success among first-year students. *Journal of Marketing Education*, 37(3), 160–170.