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Social Media for Teaching and Learning: A Technology Acceptance Model Analysis of Preservice Teachers' Perceptions During the COVID-19 Pandemic

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Abstract. The Covid-19 pandemic has resulted in the adoption of lockdowns, social distancing, and quarantines as measures to contain the spread of the coronavirus, forcing education spaces in both developed and developing economies to suddenly shift towards adoption of emergency online teaching and learning. However, developing economies were lagging in the migration to online teaching and learning strategies due to incapacity and lack of resources such as formal learning management systems (LMS) that support the migration. Social media use has been identified as an alternative given the sharp rise in social media (SM) presence and activities around the world by individuals of different age, regardless of economic status, during the lockdowns. A few studies have been conducted on the perceptions of SM use by preservice teachers in a developing country context. Through the technology acceptance model (TAM), this study applied a mixed methods approach to examine perceptions of preservice teachers on SM use in teaching during the practice periods. Results revealed that preservice teachers perceived SM platforms as mainly for social purposes rather than educational purposes, despite their high usage of WhatsApp and YouTube. The study recommends initiatives to change preservice teachers' mindset as part of teachers' professional development to get them to appreciate the usefulness of SM platforms in education contexts.

Keywords: preservice teachers' perceptions; social media adoption; teaching and learning; secondary schools

1. Introduction

Rapid increase in social media (SM) use has been noticed around the world amid the Covid-19 pandemic (Haman, 2020). SM has been useful in communicating rapid real-time messages during natural disasters, riots, entertainment updates and any instances where information must reach a wider audience quickly and

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widely (Saroj & Pal, 2020). Accordingly, SM played an instrumental role in dissemination of information and general social interactions during Covid-19 pandemic lockdowns. Many to almost all secondary and high schools around the world were closed during the Covid-19 pandemics (Sangster et al., 2020; Laato et al., 2020) as part of measures to contain the spread of the virus (Zhang et al., 2020). According to UNESCO close to about 94% of the world's students were left out of the learning environments. Schools in developed countries managed to respond timely to the crisis brought by on by Covid-19 by switching to online teaching and learning. As a result, learners were not inconvenienced from learning (UNESCO, 2020). In contrast, most schools in developing economies such as South Africa could not respond timely to the inconveniences brought by the Covid-19 pandemic and divert to online teaching and learning. The South African minister of basic education could not provide clear opening dates for schools after lockdowns. Teaching and learning planning and calendars were greatly affected, and in most instances learners and schools were unable to cover the curriculum content. The inability to switch to online teaching and learning was mainly driven by the lack of ICT infrastructure, internet connectivity, unaffordability of data costs, and ICT-pedagogical integration skills among others (Ismail et al., 2020).

SM is mostly used for entertainment, social interactions, with some professional uses (Whiting & Williams, 2013). However, SM also affords active exchange of knowledge in many learning spaces (Voivonta & Avraamidou, 2018). SM enables preservice teachers and learners to communicate through various internet-based applications while observing social distancing regulations (Vordos et al., 2020). The rapid growth of young people's enthusiasm and presence on SM seems to provide a new dawn on teaching and learning processes. SM is regarded as an easy convenient communication media between facilitators and learners in the education sector. Despite the general challenges for online presence in the context of developing countries and that SM has not been officially formalised as a teaching and learning platform, most teachers and learners in developing economies like South Africa afford devices and connectivity data for SM presence. Literature supports that SM enables learning in the social interaction spaces, enabling teachers to design curricula that meet learners' demands, presented on platforms that learners are already acquainted with. SM use for teaching and learning during lockdowns had great potential in advancing learning. Literature also supports that SM effectively supports learners' engagement, continuous teacher professional development and development of life-long learners (Beemt et al., 2019; Anasi, 2018). SM for teaching and learning stimulates learners to technologically advance their learning process while at the same time promoting preservice teachers' ICT-pedagogical integration skills. As such, SM teaching and learning should be a suitable instructional tool amid the Covid-19 pandemic as alluded to by Fedock et al. (2019).

Social media has been contended to be indefinable (Tess, 2013). However, Kaplan & Haenlein (2010) define SM as relating to internet applications that provide creation and exchange of user-generated content that necessitate a certain extent of self-disclosure that permits for a certain level of social presence. Literature on SM and education highlights pedagogical application of precise applications such

as Facebook (Yang et al., 2011) or Twitter (Aydin, 2014) for teaching and learning and examination of learning outcomes. Despite some researchers pointing out that SM is never intended for pedagogical integration and use (Bruneel et al., 2013), other researchers view this as a good starting point to discuss the possibility of SM pedagogical integration (Taylor et al., 2012). The increasing popularity of SM in teaching and learning results in it being crucial for teachers and learners to comprehend and espouse SM sites to launch ways of positioning study materials on technology-enhanced platforms (Bai et al., 2021).

While expectations remain high in some areas such as higher education, literature demonstrates that SM has little to no attention in the context of preservice teachers and secondary education teaching and learning processes. The unique educational potential of SM to increase participation and inclusion is yet to be discovered. Little is revealed about preservice teachers' perceptions about SM use in the classroom. These perceptions are critical for understanding the use of SM, because behaviour arguably reflects underlying understandings of the media as platforms of communication (Orlikowski & Gash, 1994). Non-realisation of the educational benefits of SM could be grounded in different perceptions by preservice teachers. If SM is to become an important platform for educational purposes from now going to the future, preservice teachers must recognise SM as such a platform. If ever SM is going to be an important educational tool between teachers and learners, both need to perceive media as a useful, educational communication tool.

Through empirical observation, it is apparent that there exists little to no use of SM for educational purposes by preservice teachers in South Africa. This has been evidenced by the request for preservice teachers to be present in schools during their teaching practicum periods, on a rotation basis. In difficult situations such as pandemics that require physical distancing, SM use could serve as the best educational platform for advancing teaching and learning. SM use could be argued to be most relevant in the context of South Africa, a developing country that is characterised by poor ICT infrastructure in schools, network connectivity problems, high data costs, and unaffordability of formal learning management systems by secondary schools. Observed little to no use of SM by preservice teachers could be better understood by understanding their perceptions and concerns. This is in line with propositions by Beemt et al. (2019), that it is the understanding of preservice teachers' perceptions that could make SM integration in teaching and learning possible. Importantly, unpacking preservice teachers' perceptions of SM for teaching and learning during the Covid-19 pandemic induced school closures becomes critical to potentially address the shortcomings. The study seeks to assess preservice teachers' perceptions towards SM integration and use in teaching and learning amidst the Covid-19 pandemic and lockdowns.

2. Method and Material

Informed by the pragmatism research philosophy (Kaushik & Walsh, 2019), the study followed an exploratory mixed methods approach (Creswell, 2017), comprising of two data collection and analysis phases.

2.1 Qualitative data collection

Firstly, the qualitative phase mainly comprised of collecting data in the form of 30-minute interviews, conveniently sampling 20 preservice teachers interviewed during students' work integrated learning assessment visits. Interviews were either conducted face to face and recorded or on the cell phone to maintain social distancing. However, most of the interviews were contacted by use of WhatsApp to comply with Covid-19 social distancing protocols. Interviews stopped when data saturation was reached, where preservice teachers would repeat previously raised SM perceptions and challenges, leading to a total of 20 recorded and analysed semi-structured interviews.

2.2 Qualitative data analysis

Audio interview recordings were transcribed and analysed for emerging themes through classifications and patterns that related to the data (Cohen et al., 2017). The coding process was conducted in a reproductive manner, that is, there was constant forth and back undertaking between the research data and the research framework. The themes were inductively and deductively generated through categorisation of the data through codes, ensuring that themes are tied to the data. Themes were subsequently populated on the survey questionnaire for the quantitative phase. In addition, the qualitative phase enabled the researchers to gather potential survey questionnaire respondents' WhatsApp numbers and email addresses. In addition, the snowball research technique was applied to gather more questionnaire respondents' details for the second phase.

2.3 Survey Questionnaire

Subsequent quantitative data in the second phase was collected by use of an online survey questionnaire Taherdoost (2016), which was developed on SurveyMonkey, an online research data collection platform. The survey questionnaire comprised of section A with question items covering respondents' demographics, and section B comprised of a five-point Likert scale based on question items (Adelson et al., 2010) on the frequency of using SM, and agreements on respondents' perceptions of SM in teaching and learning.

2.4 Survey Population

A database of 515 preservice teachers was populated with the assistance of work integrated learning (WIL) placement coordinators from teacher training institutions in Pietermaritzburg. As such, the study was based on a population of 515 preservice teachers.

2.5 Sampling procedure and sample size

Through Krejcie & Morgan's (1970) sample determination table, a sample of 300 preservice teachers (Confidence Level = 95%, Margin of Error = 3.5%) was drawn from the population and deemed statistically significant for the study. Resultantly, survey links targeting 300 randomly sampled preservice teachers were sent to the email addresses and WhatsApp numbers of preservice teachers in Pietermaritzburg urban and rural schools. Quantitative data was collected over a period of six months and 250 completed, valid responses were collected for analysis.

2.6 Ethical considerations

Prior to data collection, research approval was granted by the research ethics committee of the institution. Participation in the study was voluntary and participants were free to withdraw from the study at any given time with no need to provide motivation. Furthermore, informed consent was granted by participants prior to the interview process and questionnaire completion.

2.7 Survey data analysis

Quantitative data was analysed by use of SPSS for different statistical operations. Descriptive statistics including frequencies and, where applicable, mean and standard deviations were represented in tables or graphs. A chi-square test of independence was used on cross-tabulations to see whether a significant relationship exists between the two variables represented in the cross-tabulation. When conditions were not met Fisher's exact test was used. In addition, one sample t-test was included to test whether a mean score was significantly different from a scalar value. Lastly, independent samples t-test to compare two independent groups of cases.

3. The Research Framework

SM adoption for teaching and learning is related to technology adoption in this study. Several technology adoptions models have been proposed in literature, including the Technology Acceptance Model (TAM) by Rogers (1989), which has been widely used in studies on users' acceptance of new technological innovations. The TAM mainly focuses on perceived usefulness and perceived ease of use of technological innovation, which in turn directly influence the users' willingness to use such innovations. According to the TAM, external variables influence individual internal perceptions that in turn influence the behavioural intentions to use a given technological innovation. Aside from the TAM, Venkatesh et.al. (2003) proposed the UTAUT model that unpacks individuals' acceptance of a technological innovation and their intention for its use. This study employs the original TAM model and borrows the constructs that mainly focus on perceptions and are fused with themes on perceptions that arose from the qualitative phase. As a result, the constructs for interrogation in the quantitative phase included perceived ease of use, perceived usefulness, perceived learner collaboration, perceived learner active engagement, and perceived enjoyment.

Perceived ease of use in the context of the current study pertains to the extent to which preservice teachers believe that the use of SM in teaching and learning would be effortless. As such, their perceived ease of use goes on to influence their perceived usefulness, which denotes the degree to which preservice teachers believe using SM for teaching and learning would enhance their teaching experience and performance (i.e., improved comprehension of concepts by learners, sustained pass rates). In addition, the current study focused on perceived enjoyment in the use of SM as an innovation. Perceived enjoyment relates to the degree to which using a technological innovation is viewed as fun (Venkatesh, 2000; Lee et al., 2019), and has an influence on the intention to use, perceived ease of use and perceived usefulness (Park et al., 2014; El Shamy & Hassanein, 2017).

The constructs were supported by the qualitative results and are discussed below.

4. Qualitative preservice teachers' perceptions

Preservice teachers expressed different perceptions regarding use of social media for teaching and learning. Some preservice teachers demonstrated some form of aversion towards utilisation of SM platforms for teaching and learning. On the other hand, some expressed usefulness of SM on their content delivery. The main reason that emerged is the absence of real social distancing in the use of social media. Below are some of the mixed perceptions regarding SM from the study interviewees. Identification of the interviewed preservice teachers is represented as PST 1, PST 2, PST etc. for anonymity purposes.

> *"Learners can be disrespectful on the SM platform and hence I would not venture into mixing myself with learners in their turf. I cannot share my cell phone number with learners, they can then communicate with you during unholy times, so I rather keep my distance", (PST 1).*

The main social media platform that preservice teachers suggested that has near universal access for the secondary school learners was WhatsApp. WhatsApp had more accessibility when compared with other learning platforms such as Apollo that were adopted post the Covid-19 pandemic due to data and connectivity needs. This platform has a near universal presence as illustrated by one of the respondents:

> *"WhatsApp can be useful in teaching and learning. In as much as we adopted Apollo as a learning platform (Learning management system), the upload of material had to be restricted to heads of departments or subject heads. A lot of training needed to be done by the schools to the school leadership as Apollo was new. However, everyone uses WhatsApp with a few extreme exceptions who cite religious reasons for not using WhatsApp", (PST 2).*

Another argued:

> *"WhatsApp has the advantage of being able to share media including handouts in the form of documents which can be shared in portable document format, or in the Microsoft suite which include words and PowerPoint slides. In other words, during the pandemic initial period, I had to share with my students via WhatsApp all the learning material", (PST 3).*

The participant at an urban school suggested that WhatsApp was used as a platform to share further study material where the handouts would be shared. After submissions by the learners the answers were again shared on the WhatsApp platform, so learners could then learn the skill of self-assessment. In fact, answers were sent to individual learners who would have submitted the work. Here is their statement:

> "*I submit problems on the SM platform then only sent answers to the students who would have returned work showing that they were working", (PST 4).*

Another demonstrated the unhappiness with social media use due to the ways in which the learners wrote responses on the different platforms and the effects of this on social distance.

> *"On SM, learners tend to use unhelpful shorthand which they generally understand. I therefore avoid such a platform because the learners have become so used to their shorthand that they would not appreciate my presence. Such shorthand as [lol] or [kkkkk] and some emoticons that may not be in line with my expectation generally reduce that social distance I believe should be maintained between the learners and their educator", (PST 5).*

The other educator expressed the need for social distance: -

> *"To me it's not professional to chat with students on social media, a learner can't be my friend on Facebook if they need to communicate with me, they will rather do that via WhatsApp of make a regular call. But Facebook and Instagram for me I just don't think its professional, learners might cross the line and think I am one of their friends besides I need to maintain my privacy especially from these young one", (PST 6).*

One preservice teacher had different opinions: -

> *"I feel that SM would improve preservice teachers and learners' relationship, personally I do not have a problem with communicating with learners using certain tools of social media, but Facebook imposes problems of privacy. It would be great and easier if as teachers we manage to interact with and teach learners on social media, besides most of these young ones are already present on most social media platforms. However, I am worried if we would be able to control learners on these platforms. Some learners are too forward and can send you private messages which have nothing to do with learning", (PST 7).*

> *"I don't know if any of my students are on Facebook of any other social media platforms, it just feels weird to be friends with my students on such socializing platforms. I can only connect there with my family and friends not students, there must be that boundary", (PST 8).*

> *"With my students I have tried WhatsApp to communicate give them assignments and do group discussions. But it didn't go well, so now when I think of Facebook, Instagram, and other platforms I feel it will be worse, it's hard to monitor and control learners on these platforms. Some divert from learning and concentrate on disturbing things; I have received so many complains so far from other learners accusing other learners of sharing explicit and unwelcome content on WhatsApp. So, for me it's a no no!!", (PST 9).*

One of the preservice teachers expressed that: -

> *"I have been using WhatsApp to communicate with students and everything was going well. I involved parents so that they monitor the learners' activities from home. You know learners can easily get distracted and focus on other useless things. So, parents made it easier for me, and*

in most instances, I would prefer using parents WhatsApp details for monitoring and control", (PST 10).

"Social media has enabled me to share my own recorded videos delivering content and share to learners during lockdowns. I would post the videos o]in the class WhatsApp groups and ask students to watch and summarise what's standing out from the videos. It has been phenomenal, it worked well for me. Although had instances where some learners did not have data timeously, that became a challenge", (PST 11).

"Social media teaching and learning cannot work for us. We had private companies that came in and donated tablets to our school for learners to use. All the devices were stolen, the communities around don't value such initiatives. We have also numerous incidences where learners got mugged and their cell phones were stolen. In such instances how would someone expect us to use social media for teaching and learning? We just wait for directives from the department to go back to classrooms and do face to face lessons that's the only way that can work. I strongly feel social media won't work for us, maybe it works for privileged schools with high security", (PST 12).

"Platforms such as YouTube really helped me to share practical content with my learners. For example, I teach biology, and those numerous videos on such platforms helped my students to visualise things they wouldn't without it. remember our science labs have been vandalized and there is absolutely nothing to show learners as we try to engage in practicals", (PST 13).

"Our learners travel long distances to come to and from school here in the rural areas. Obviously despite all these problems caused Covid 19, if we had gadgets simple as smart phone, network signals and the data, we would be happy to use social media for teaching our learners. We would easily give them assignments, supplement our content with media such as videos, audio, and even online PowerPoint slides", (PST 14).

From analysed qualitative data, it is evident that preservice teachers have mixed perceptions of social media for teaching and learning. Some expressed perceived usefulness and importance whilst others perceived social media use for teaching and learning to be problematic. Interestingly, a trend emerged where urban based preservice teachers generally cited the negative side of SM platforms whilst rural based preservice teachers mostly cited challenges of SM use in teaching and learning rather than perceptions. Context related perceptions emerged, differing between rural and urban preservice teachers. Most rural based preservice teachers believed SM could be useful in overcoming Covid-19 teaching and learning challenges. However, they cited challenges associated with rural poverty and unavailability of gadgets, let alone the WhatsApp connectivity data. Preservice teachers in these contexts could not fathom the use of SM; they simply waited for the turns of the announcements by the minister of education regarding pupils' return to school. They cited absence of devices and the availability of the data

while they may have appreciated the affordances of technology. They further cited the challenge of digital literacy wherein Covid-19 meant everyone was supposed to shift their mindset as well as ability to use gadgets, namely laptops and cellular phones, for learning and teaching. This was almost an impossibility given a number of learners staying with grandparents, where the most computer literate household member would be the grade 11 learner or grade 8 learner who has not been afforded access to the cellular phone.

Despite a few preservice teachers having made initiatives to communicate with learners, these have been personal efforts, with no SM policies, procedures or guidelines from the education authorities. Interviewees alluded to the need to provide proper policies and guidelines in line with the ethos of netiquette which will guide interactions on social media. They found SM to have potential which can, and has been, leveraged by other learning platforms where they were able to learn and cover the Covid-19 curriculum as well as engage in revisions for the 2020 National Senior examinations. The inconclusive results from the qualitative phase were necessitated for the quantitative data collection and analysis phase. Themes arising from the qualitative phase were incorporated in the survey questionnaire. In addition, the quantitative phase was guided by Technology Acceptance Model (TAM). The section below discusses the TAM and how it is applied in the study.

5. Quantitative Data Interpretation and Results

5.1 Research construct validity

From a pilot study with 25 respondents who used SM for more than an hour per day, a Cronbach's alpha value of 0.7 is revealed for each construct. As shown in Table 1, a value of 0.7 and higher provided a valid statistical basis for a wider survey in accordance with Fernandes (2012). In that regard, modifications informed by the feedback were implemented on the instrument for the formal wider survey.

Table 1: Construct Validity

Constructs	Items	Loadings	MSV	Cronbach's Alpha
Perceived learners' engaged learning	PLE1	.881	0.192	.834
	PLE2	.812		
	PLE3	.846		
	PLE4	.824		
Perceived learners' collaborative learning	PLC1	.785	.340	.782
	PLC2	.706		
	PLC3	.810		
Perceived usefulness	PU1	.768	.280	.766
	PU2	.796		
	PU3	.773		
Perceived ease of use	PEU1	.813	.345	.804
	PEU2	.798		
	PEU3	.780		

	PEU4	.809		
Perceived enjoyment	PE1	.785	.230	.779
	PE2	.774		
	PE3	.876		
SM Adoption	SMA1	.858	.218	.848
	SMA2	.872		
	SMA3	.892		
Model fit indices		X^2 / df = 2.221 (p<.001); IFI = .950; CFI = .940; TLI = .932; RMSEA = .066		

5.2 Study Survey

The qualitative phase of the study provided different useful insights regarding how preservice teachers perceived the use of SM in teaching and learning. The quantitative phase of the study applied the findings to a wider context in the form of a closed online questionnaire to collect data from 250 preservice teachers around Pietermaritzburg urban and rural schools. The revised questionnaire was loaded on SurveyMonkey, an online research data collection tool. Survey links were sent to preservice teachers' email addresses and WhatsApp numbers. Instant alerts would report all completed survey responses as data collection proceeded. A data file with all responses was exported from SurveyMonkey to Excel for data analysis and presentation. From the 250 completed and valid survey responses, 135 respondents were male while 115 respondents were female. In addition, of the total respondents, 155 are based in schools in the urban area while 95 respondents are preservice teachers from the rural areas. The sample representation of urban versus rural preservice teachers is different possibly due to network and data availability disparities as they participated in the survey. The demographic characteristics of the respondents to the study survey are presented in table 2 below.

Table 2: Respondents Demographics

Demographics	**Criteria**	**Percentage**
Gender	Male	54%
	Female	46%
School location	Urban	62%
	Rural	38%
Qualification	Bachelor's	70%
	Honour's	25%
	Master's	5%
Daily SM usage	1-2hrs	10%
	3-4hrs	16%
	more than 4 hrs	74%

Demographic data reveals that of all the questionnaire respondents, 40% had some form of SM media presence and that on average they spent more than an hour per day on SM. Demographic data demonstrates that 74% spend more than four hours on SM platforms per day, the highest percentage of the respondents, which could be attributed to more free time due to lockdowns. The results sustain research from Koeze and Popper (2020) and Limaye et al. (2020), who found

increased SM use during the pandemic. It would be expected that preservice teachers take advantage of their SM knowledge to develop positive attitudes for instructional use in teaching (Beemt et al., 2020; Buus, 2012). Constructs from the data analysed in the qualitative phase were measured against the Likert scale of 1 (strongly disagree) to 5 (strongly agree). The section below presents preservice teachers' level of SM integration during Covid-19 lockdowns.

Table 3: Preservice teachers' social media integration in teaching and learning.

	Level of Integration (n=250)		
	$\bar{x}$	S.D.	Level
Integrate SM in teaching and learning			
2.1 WhatsApp	3.96	2.10	High
2.2 Facebook	0.78	2.92	Lowest
2.3 Skype	1.01	1.56	Lowest
2.4 Blogs	0.20	1.12	Lowest
2.5 YouTube	3.95	2.07	High
2.6 Twitter	0.10	1.52	Lowest
2.7 Instagram	0.17	1.06	Lowest
2.8 Podcasts	0.14	1.08	Lowest

Table 3 above shows that the three social media platforms most frequently used for teaching and learning were WhatsApp (high level of agreement; ($\bar{x}$ = 3.96, S.D. = 2.10), followed by YouTube (moderate level; ($\bar{x}$= 3.95, S.D. = 2.07). Results reveal that other platforms had lowest levels of consideration by preservice teachers for integration into teaching and learning. The finding on high usage of YouTube is in line with Anna (2019), who reported that YouTube is one of the most installed and used platforms by preservice teachers, as they access tutorial videos of different concepts and can be adopted as an instructional channel (Krauskopf et al., 2012). In addition, the results are supported by findings from Moran et al. (2011), who revealed that education professionals mostly use YouTube, however Twitter and Facebook were mostly used by the young generation (i.e., learners).

Having presented on the use of various SM platforms, the section below presents on preservice teachers' perceptions of SM integration into teaching and learning.

Table 4: Preservice teachers' perceptions of social media integration in teaching and learning

	Perceptions of social media in teaching and learning		
	$\bar{x}$	S.D.	Level of Perception
3.1 I perceive social media as a useful tool for teaching	2.97	2.05	moderate
3.2 I believe that social media can enhance the teaching process	2.90	1.99	moderate
3.3 Social media can facilitate engaged learning process	2.96	1.96	moderate
3.4 Learners can actively participate in the comfort of their zones	3.60	1.02	high

3.5 Social media improves learners' problem-solving capabilities	3.20	1.20	high
3.6 Social media facilitates collaborative learning among learners	3.40	1.98	high
3.7 Social media can help develop independent learning	2.80	2.08	moderate
3.8 Social media makes it easy for learners to develop creating thinking skills	3.10	2.26	high
3.9 Social media will be easy to use for learners because they are already present on the platforms	2.96	1.06	moderate
3.10 SM use affords me opportunities that I wouldn't get in the classroom	2.80	1.20	moderate
3.11 SM brings enjoyment to learning	2.90	1.16	moderate
3.12 Lack of social media pedagogical integration skills hinders integration	4.60	1.40	high
3.13 Social Media cannot be applied for formal teaching and learning	3.10	1.10	high
3.14 No-one takes learning seriously when done via social media	3.98	2.10	high
3.15 Difficult to monitor and control learners' activities on social media	1.20	1.01	low
3.16 Learners can easily become distracted on social media	2.30	2.16	low
3.17 SM promotes anxiety and dependence on learners	3.90	2.60	high
3.18 I intend to use social media in my teaching	1.60	1.04	low

Results in Table 4 reveal that preservice teachers perceived SM as a useful tool for teaching and learning ($\bar{x}$ = 2.97, S.D. = 2.05). They also perceive that SM can enhance teaching ($\bar{x}$ = 2.90, S.D. = 1.99), facilitate the learning process ($\bar{x}$ = 2.96, S.D. = 1.96), and improve learner problem solving capabilities ($\bar{x}$ =3.20, S.D. = 1.20). In addition, preservice teachers perceive that SM as a tool can facilitate learners' collaborative learning ($\bar{x}$ =3.40, S.D. = 1.98), while at the same time promoting learner independent learning ($\bar{x}$ =2.80, S.D. = 2.08) and leading to learners' development of critical thinking skills ($\bar{x}$ =3.10, S.D. = 2.26). This is in agreement with Carpenter (2014), who reported that preservice teachers appreciated the benefits brought by SM, such as Twitter. These findings resonate with Acarli and Sağlam (2015), who revealed that study participants were enthusiastic to integrate SM in their future professions. Preservice teachers perceive that it is easy to integrate SM in teaching and learning since learners are already available on various SM platforms ($\bar{x}$ =2.96, S.D. = 1.06).

However, preservice teachers perceived a lack of SM pedagogical integration skills as a hindrance to integration ($\bar{x}$ =4.60, S.D. = 1.40). This result agrees with Beemt et al. (2019), who reported that experience, lack of knowledge and skills influences teachers' attitudes towards SM integration. The importance of teachers' skills and knowledge for SM pedagogical integration has been noted by Buus (2012). With the rise in SM use during the COVID-pandemic as observed by Limaye et al. (2020), the expectation would be that preservice teachers' SM knowledge and skills improved. However, the limited SM knowledge and skills

previously reported by Moran et al. (2011) persist, resultantly demoralising teachers on use of SM for teaching. Furthermore, preservice teachers perceived SM as inapplicable in formal teaching and learning ($\bar{x}$ =3.10, S.D. = 1.10) as they believe that no one takes anything done via SM seriously ($\bar{x}$ =3.98, S.D. = 2.10). This is in agreement with Deng and Tavares' (2013), whose study revealed that preservice teachers viewed SM as informal, and teachers' presence within the SM space would limit free interactions amongst learners. In addition, there would be a general reluctance to use SM (e.g., Hurt et al., 2012) until it is officially implemented as a part of course delivery. As such, learners need to receive developmental assistance that prepares them to learn with and through SM, as the current appreciation is that SM is for social interaction and entertainment purposes (Chen & Breyer, 2012). Furthermore, school level support (Ismail et al., 2020) is needed to assist preservice teachers to improve SM instructional integration and to align with learners' developmental needs.

Preservice teachers perceived SM for teaching and learning rather as a source of anxiety and dependence, as promoted by learners ($\bar{x}$ =3.90, S.D. = 2.60). Therefore, as suggested by (Beemt el al. 2019; Kormos & Nijakowsk 2017), there is a need for support to conquer digital fears and anxiety, especially for teachers in developing economies that are characterised by a lack of integration abilities (Ismail, 2020). In addition, preservice teachers felt that it was difficult to monitor and control learners' activities on SM ($\bar{x}$ =1.20, S.D. = 1.01), and the perception is that learners can easily become distracted ($\bar{x}$ =2.30, S.D. = 2.16). The challenge of learners being distracted by SM during classes resonates with Cetinkaya (2017), whose study suggested that close monitoring is needed when engaging learners through SM as learners' attention can easily be distracted. Results further show general disagreement that preservice teachers would use SM in their teaching and learning ($\bar{x}$ =1.60, S.D. = 1.04). For the above beliefs, it is undeniable that preservice teachers do not have intentions to integrate SM in their teaching. However, preservice teachers need to understand how their roles have changed, as suggested by Hoyos (2014). Preservice teachers need to facilitate learning leveraging on SM, regardless of the challenges. Accordingly, there is need for encouragement and support from education authorities to shift preservice teachers' perceptions regarding SM use in teaching. These arguments resonate with Ismail et al. (2020) who postulated that school-level support from mentors and school principals would be valuable. In addition, support need to be characterised by access to digital technologies and related devices, teacher capacity development, redesign of the curriculum to include SM integration and pedagogical concepts by teacher training institutions (Jogezai et al., 2018; Mulenga & Marban, 2020).

Despite preservice teachers perceiving SM to be a useful teaching and learning tool that can facilitate the learning process and problem-solving capabilities, they felt that the lack of formalisation, integration skills and knowledge led them to perceive SM as platforms that are irrelevant for teaching and learning. This agrees with researchers (e.g., Crook, 2012), who postulate that misalignment exists between SM use and support from schools' administrators. In the absence of the support from school administrators, preservice teachers become uncertain

(Mathieson & Leafman, 2014) and can hardly explore emerging pedagogical platforms such as SM. Despite findings revealing preservice teachers' positive perceptions on SM, and recognition of SM importance in promoting learner independent learning, collaborative learning, and development of critical thinking skills, there are also general negative perceptions that SM promotes anxiety and dependence. Therefore, it would be difficult to monitor learners' activities and learners would get easily distracted. As such, the results reveal mixed perceptions on SM use in teaching and learning by the study participants. However, overall, preservice teachers would not use SM for teaching and learning. The researchers went on to perform independent sample t-tests to comparatively ascertain the representation of rural preservice teachers against urban preservice teachers in the mixed perceptions. Some unexpected results were deduced from the t-tests as shown in Table 5 below.

5.3 Urban vs rural preservice teachers' perceptions comparative analysis

Further analysis was done to ascertain whether SM perceptions were different for urban and rural preservice teachers through independent sample t-tests as presented in Table 5 below.

Table 5: Urban versus rural preservice teachers' perceptions

	Teacher's Context	N	Mean	S D
Perceive social media as a useful tool for teaching	Urban	155	3.18	.625
	Rural	95	4.19	.608
Believe that social media can enhance the teaching process	Urban	155	2.94	.247
	Rural	95	4.82	.390
Social media can facilitate learning process	Urban	155	3.65	.479
	Rural	95	4.55	.549
Social media improves learners' problem-solving capabilities	Urban	155	3.49	.686
	Rural	95	3.16	.668
Social media facilitates collaborative learning among learners	Urban	155	3.15	.854
	Rural	95	4.75	.488
Social media can help learners develop independent learning	Urban	155	2.94	.589
	Rural	95	3.91	.709
Social media makes it easy for learners to develop creative thinking skills	Urban	155	3.66	.699
	Rural	95	3.21	.787
SM use affords me opportunities that I wouldn't get in the classroom	Urban	155	2.14	.105
	Rural	95	4.86	.608
Lack of social media pedagogical integration skills hinders integration	Urban	155	3.78	.754
	Rural	95	4.20	.682
Social media can't be applied for formal teaching and learning	Urban	155	3.86	.511
	Rural	95	3.01	.802
No-one takes learning seriously when done purely via social media	Urban	155	3.86	.612
	Rural	95	3.02	.563
Difficult to monitor and control learners' activities on social media	Urban	155	4.90	.305
	Rural	95	3.73	.451
Learners can easily become distracted on social media	Urban	155	4.33	.474
	Rural	95	3.05	.429
SM promotes anxiety and dependence on learners	Urban	155	4.64	.602
	Rural	95	3.04	.613
I intend to use social media in my teaching	Urban	155	3.87	.373

	Rural	95	4.70	.462

Analysis to determine the existence of the difference in perceptions by rural and urban preservice teachers revealed significantly more agreement by rural preservice teachers (M = 4.19, SD = .625) than by urban preservice teachers (M = 3.84, SD = .609) that SM is a useful tool for teaching and learning. This is a positive response to a call by Aguliera and Nightengale-Lee (2020), who argued that rural schools need to exploit effortlessly available resources such as SM. However, there is significantly more agreement by rural preservice teachers (M = 4.20, SD = .682) than by urban preservice teachers (M = 3.78, SD = .754) that a lack of social media pedagogical integration skills hinders integration. This result can be attributed to a lack of exposure, resources and ICT support infrastructure that has always posed a challenge for rural education contexts. Similar resource challenges in rural contexts have been reported in the South African education context. For example, a study by Oyedemi & Mogano (2018) demonstrated that an excess of 82% of the students from rural schools had no access to ICT and internet connectivity resources. In addition, the findings on resource challenges in South African rural education contexts resonate with Omodan (2022), whose study suggests that a lack of resources impacted transformation in rural schools. It becomes evident that resource constraints negatively impact rural schools and learning contexts in their quest for advancing technologically supported innovation in teaching and learning.

Interestingly, the results bring in a new dimension that urban preservice teachers might have made towards efforts to integrate SM in teaching and learning, and the challenges associated. This is demonstrated by the differences in their perceptions. Urban preservice teachers' perceptions seem to be guided from a reflective standpoint of having engaged in SM integration initiatives and possibly facing challenges first hand, due to their relative advantage with access to technical and social resources in comparison to rural preservice teachers. This is in accordance with findings by Mlitwa and Nonyane (2008). This is demonstrated as the results reveal that there is significantly more agreement from urban preservice teachers (M = 3.86, SD = .511) than rural preservice teachers (M = 3.01, SD = .802) that social media cannot be applied for formal teaching and learning. In addition, there is significantly more agreement by urban preservice teachers (M = 3.86, SD = .612) than by rural preservice teachers (M = 3.02, SD = .563) that no-one takes learning seriously when done purely via social media. Furthermore, urban preservice teachers (M = 4.90, SD = .305) agree more than rural preservice teachers (M = 3.73, SD = .451) that it is difficult to monitor and control learners' activities on social media, and that SM is a distraction to learning. Lastly, urban preservice teachers (M = 4.64, SD = .602) agreed more than rural preservice teachers (M = 3.04, SD = .613) that SM promotes anxiety and dependence on learners. These findings on preservice teachers' negative perceptions are shaped by the existence of policies that ban learners from utilising their personal digital devices in South African schools as reported by Mwapwele (2019). Differences in perceptions suggested in the current study is consistent with Bautista et al. (2022), whose study on "Filipino teachers attitudes towards distance learning during Covid-19 pandemic" reported negative attitudes and perceptions emanating from

unavailability of infrastructure requirements and the difficulty in managing the pedagogical technologies. Therefore, preservice teachers demonstrate different perceptions, shaped by the contextual factors such as availability of required resources to support the advancement of the innovation concerned.

Surprisingly, there is significantly more agreement by rural preservice teachers (M = 4.70, SD = .462) than by urban preservice teachers (M = 3.87, SD = .373) that they intend to use social media in their teaching. The findings in this study are consistent with previous findings (Liu & McCombs, 2011) that teachers are keen to incorporate SM in their teaching. Interestingly, rural preservice teachers demonstrated positive perceptions about SM integration in teaching and learning in comparison to urban preservice teachers through a convergence of quantitative results with initial qualitative results that can be attributed to their appreciation that SM can indeed be regarded as an important pedagogical tool in the twenty-first century, as noted by Alghamdi and Al-Ghamdi (2021). The findings suggest that positive perceptions by rural preservice teachers on SM for teaching and learning as a potential alternative can be linked to the general lack of formal resources such as computers, devices, computer programs, internet connection, and computer labs in rural learning contexts which is consistent with findings (Chibisa & Mutambara, 2022; Mlitwa & Nonyane, 2008; Mutambara & Bayaga, 2021).

However, rural preservice teachers reported a lack of SM integration skills as a hindrance to the use of SM in teaching and learning. The current study finding resonates with Mwapwele (2019), whose survey reported that South African rural teachers were optimistic about ICT integration in teaching and learning, despite resource access challenges they experienced. In a separate study, Mutambara and Chibisa (2022) observed that in rural areas, technology affordability was beyond the reach of many. Generally, negative perceptions of SM integration in teaching and learning are observed from urban preservice teachers. Urban preservice teachers argued that SM is difficult to apply in formal teaching and learning, that no one takes learning seriously on SM, and monitoring and controlling learners' activities on SM was difficult. This finding resonates with Ndebele and Legg-Jack (2022), whose study suggests that preservice teachers' mentorship on skills and competencies are of vital importance for teacher professional development. This is applicable in successful SM integration. The differences in the urban and rural preservice teachers' perceptions could be attributed to the digital divide, as noted by Oyedemi and Mogano (2017), in that urban preservice teachers have indeed tried integrating SM in their teaching and learning processes and failed, while rural preservice teachers are still optimistic that given the necessary pedagogical integration support, conditions on data, and connectivity are met, SM could be useful in teaching and learning. We can, then, say that rural preservice teachers appreciate SM as an alternative pedagogical approach to teaching. This finding resonates with Nhongo and Siziba (2022), whose study postulates that rural education contexts are normally excluded from the transformative initiatives especially when generic strategies are applied across contexts.

6. Conclusion

The study explored rural and urban preservice teachers' perceptions on SM in teaching and learning in the context of the COVID-19 pandemic. The need for social distancing brought by the Covid-19 pandemic has necessitated preservice teachers' increased presence on SM, knowledge of SM use, and consequently affected their perceptions of SM for general use. The study concludes that there exist differences in the perceptions of SM in teaching and learning by rural and urban preservice teachers. Accordingly, customised and targeted intervention strategies need to be designed and implemented to improve preservice teachers' perceptions. Most South African learners are already on various SM platforms. As such, the South African basic education department needs to formally recognise SM's applicability as a supplementary teaching and learning tool that has the potential to afford flexibility in learning. Resultantly, the integration of SM in teaching could be beneficial to developing counties like South Africa in which, according to Attwood et al. (2013), schools are characterised by ICT resource constraints and incapable teachers (Ismail et al., 2020). It is imperative to transform and reinforce preservice teachers' perceptions into positive perceptions through policies that support preservice teachers' SM pedagogical integration resources, knowledge and skills, as innovative platforms for learning inarguably need to be advanced. This agrees with propositions by Mutambara and Bayaga (2021), who advanced that for successful mobile learning in rural areas, resource availability becomes imperative.

7. Research Implications

The study has significant implications for secondary school learners, preservice teachers, school principals and basic education policy makers. The South African secondary school system is in a crisis caused by the Covid-19 pandemic, in addition to the alarming ever increasing number of secondary school learner dropouts. As a high number of secondary school learners are affected and deprived of learning due to school closures as part of Covid-19 responses, SM use in teaching and learning could be part of the solution. However, to achieve SM use in teaching and learning, there is need for a total shift of preservice teachers' perceptions on the role of SM. SM's significant effects on the preservice teachers' perceptions call for the need for their support and encouragement on use in teaching and learning. Training and support in the form of continuous teacher professional development, mentoring, educator capacity building and resource support in form of data, digital platforms and devices could make preservice teachers' perceptions of SM in teaching and learning shift.

The government, through the relevant department of basic education, needs to design and implement initiatives for improved teacher SM awareness and integration in the instructional design. These support initiatives need to be implemented from the national department of basic education, developing SM use policies in schools that permit controlled and guided use of personal digital devices in school premises. The provincial department of basic education and district education administrators could break down those national policies and guidelines into manageable action plans. Schools could develop their own securely managed SM webpages, chat groups, and ask preservice teachers and

learners to join and engage in educational discussions and access to learning material. These platforms could be joined using official school learners' numbers for security and accountability purposes in case learners post irrelevant content. Importantly, education stakeholders including the government, private sector and non-governmental organisations need to participate in the capacitation of schools and teachers through provision of improved ICT infrastructure and internet connectivity as these are seen as lacking in a developing country context.

8. Limitations and Future Work

Despite the study having presented interesting findings, there are a few limitations worth noting. The sample population was limited to preservice teachers in Pietermaritzburg urban and rural areas. Hence, the study results may not be generalisable to a wider South African context. In addition, the study mainly focused on preservice teachers. Maybe future research could also incorporate the learners to understand their perceptions of SM in teaching and learning, as they are important stakeholders in its implementation. In addition, future work could look at specific SM platforms for teaching and learning separately as they could present different results.

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