

## ORIGINAL RESEARCH

# Internet usage among undergraduate nursing students: A case study of a selected university in South Africa

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**Received:** January 16, 2018

**Accepted:** March 13, 2018

**Online Published:** March 27, 2018

**DOI:** 10.5430/jnep.v8n8p75

**URL:** <https://doi.org/10.5430/jnep.v8n8p75>

## ABSTRACT

**Background:** The internet has become an indispensable tool for teaching and learning, research, and communication in today's educational landscape. Nursing students, in particular, rely heavily on the internet to access scholarly resources, collaborate with peers, and engage in online learning activities. This article explores the general internet usage of undergraduate nursing students at a selected university in South Africa.

**Methods:** This study used a quantitative, non-experimental, exploratory, and descriptive design with 115 undergraduate nursing students. Data were collected through a structured questionnaire and were analysed descriptively.

**Results:** Undergraduate nursing students used the internet for academic purposes (96.5%), communication (82.6%), leisure activities (71.3%), and work-related tasks (53.9%). Facebook was the most frequently used social network (77.4%). Barriers to internet use include restricted access to certain websites (62.6%), slow internet connection (55.7%), limited training in internet usage (38.3%), and a scarcity of computers (37.4%).

**Conclusion and recommendations:** Educational institutions and policymakers should explore strategies to enhance students' digital experiences. This can be achieved by improving internet infrastructure, offering comprehensive internet usage training, increasing computer accessibility, and reevaluating website restrictions. Emphasising internet literacy, promoting diverse online platforms and fostering a more inclusive online environment are recommended.

**Key Words:** Internet, ICT, Nursing students, Undergraduate

## 1. BACKGROUND

The Internet is becoming an increasingly indispensable tool in academic institutions and workplaces globally.<sup>[1-4]</sup> Wolf, Wenskovitch<sup>[5]</sup> argue that in the digital era, nursing is transforming itself into a profession supported by technology to provide quality care and services to the patients. The importance of the internet in teaching and learning in nursing has therefore been recognized.<sup>[6,7]</sup> According to Hallila, Al Zubaidi,<sup>[7]</sup> nursing students are required to use computers and the internet to search for information from various websites and to use a number of software packages to com-

plete assignments. Guohong, Ning<sup>[8]</sup> stated that the use of the internet in education offers considerable autonomy to the learners, as it enables them to be self-directed and promotes active learning. In order to achieve this, computer and internet literacy is essential for students, with Hallila, Al Zubaidi<sup>[7]</sup> arguing that these skills assist students to achieve their learning objectives, and is important for their future career.

The use of the internet to educate healthcare professionals is intended to prepare students to meet the demands of an increasingly technological world.<sup>[9]</sup> It is important that they

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advance their knowledge and skills in using the computer and the internet.<sup>[5]</sup> Nursing students and nurses need to be knowledgeable about online resources in order to provide evidence-based practices, and assist patients and their families to access reliable information. The literature indicates that the internet is gaining ground as a fundamental source of health-related information.<sup>[10-13]</sup>

The use of the internet in education enables scholars and academic institutions to have access to a variety of up-to-date information across the world,<sup>[14]</sup> and empowers researchers and academic organizations to disseminate data to an extensive audience.<sup>[15]</sup> A study conducted by Kheswa<sup>[16]</sup> found that undergraduate students accessed the internet on campus and off campus, and were mainly used for: e-mail (99.2%), the Web (93.3%) and social networks (66.7%), while Shezi<sup>[17]</sup> reported that participants used the internet to access academic materials (47%). As the growth of the Internet and the number of the students accessing academic institution increases, it has the potential to play a significant role in teaching and learning,<sup>[18]</sup> and as an academic tool among undergraduate students. It should respond to the information demands of the academic world, including the health sector, thereby allowing people to excel in their academic activities.<sup>[18]</sup>

The use of Information and Communication Technologies (ICTs) is a policy directive in South Africa.<sup>[19]</sup> E-learning and innovative use of ICTs in the education sector assist in addressing inequalities in schools across South Africa, and facilitate the ongoing improvement of educator skill.<sup>[19]</sup> The face of higher education in South Africa has changed radically. ICTs have expanded access to information across a myriad of geographic areas.<sup>[20]</sup> Institutions are investing heavily in ICTs, increasing reliance on online portals for access to vital study information and “open” educational resources. This facilitates “distance learning”, remotely enabling students to access course material and assignments and allowing them to work during the day and virtually “attend” classes afterwards.<sup>[20]</sup> Internet-based learning also fills a clear need for students in remote areas, providing a platform for the student-lecturer interface in spite of geographic limitations. Internships, graduate schemes and scholarship notifications can be posted on educational sites, thus extending access to post-university opportunities across a wider audience.<sup>[20]</sup>

The University of KwaZulu-Natal (UKZN) is promoting the use of innovative teaching and learning across its Colleges. In recent years, the College of Health Sciences (CHS) at UKZN has initiated new innovative web-based platform to support instruction delivery which is called UKZNtube. Its features

include live broadcast (either video and PPT or audio and PPT); pre-recorded content; flipped learning; playlists and question gateways, as well as interactive questions.<sup>[21]</sup> Furthermore, it integrates with a multitude of other collaboration and communication tools like Moodle.<sup>[21]</sup>

Since 2013, CHS invested in new Proline Tablet PCs as part of a cutting-edge Visual Learning Project being piloted at UKZN in order to achieve a number of goals in the University’s Teaching and Learning space; particularly providing a mechanism to stream lectures live, and record lectures for later on-demand viewing. Thus facilitating access to electronic resources.<sup>[21]</sup> Nursing students use the internet to for different purposes, including access to the academic resources, and communicating peers and teachers.<sup>[22]</sup> At UKZN, nursing students are progressively being empowered to use ICT facilities, tools and software for educational purposes, and this is done through ongoing training organized by Information and Communication Services (ICS), the University library, and the School of Nursing and Public Health.

Despite the internet becoming an important component in academic institutions, the literature reflects its under-utilization due to a number of factors that hindered successful information gathering, including the lack of access to a computer<sup>[23,24]</sup> and time to search large volumes of information.<sup>[25]</sup> Further research revealed a reluctance among nurses to use electronic resources,<sup>[26]</sup> and that they exhibited a lack of computer knowledge and skills.<sup>[24,27-30]</sup> Adopting the use of computers and internet in education requires a shift in the mindset of both teachers and learners, which is accompanied by the relevant infrastructure. In addition to making ICT infrastructures available in schools, and integrating these into the curricula, learners need to be equipped with knowledge and skills to use Information Communication Technologies (ICT).<sup>[30]</sup> Against this background, this article explores internet access and use by undergraduate nursing students at a selected university in South Africa.

## 2. METHODS

A positivism paradigm underpinned this study, with a quantitative, non-experimental, exploratory-descriptive design being used to explore the knowledge and skills of undergraduate nursing students on internet usage at a University in KwaZulu-Natal. The descriptive design was adopted to obtain in-depth information about characteristics of a particular field of study. Data were collected from students registered for the Bachelors of Nursing (BN) and Bachelors of Nursing Advanced Practice Programs (BNAP). Using stratified sampling, a total of 141 participants were selected from a population of 222. The sample size was calculated using

Raosoftware sample calculator with a 95% confidence interval. Of the 141 who were invited to participate, 115 undergraduate nursing students completed the research instrument, resulting in 81.1% response rate.

A structured questionnaire survey was used, with the research instrument being adapted from Kheswa,<sup>[16]</sup> the choice of questions being guided by the research objectives and the literature. The questionnaire consisted of the following seven categories: demographic data; perceived level of competency to use computers and the internet; reasons for using computers and the internet; academic activities conducted on the internet; awareness of electronic resources and search engines used; types of social media used, and constraints encountered while using internet facilities on campus.

In this study, the Cronbach's Alpha was .879, and the Cronbach's Alpha Based on Standardised Items was .935, which indicated a high internal consistency. Data were collected after obtaining an ethical clearance from the University of KwaZulu-Natal's Biomedical Research Ethics Committee (HSS/0364/012M), and permission obtained from the selected University to conduct the research. Students were addressed in their classrooms, where an explanation of the

study was provided before the identified participants were requested to sign a consent form. The Statistical Package for the Social Sciences (SPSS) version 19 was used to capture and analyse the data. The findings for each category are presented descriptively in tables and graphs using frequencies and percentages. The Chi-square and Kruskal-Wallis tests were run in order to establish the association between the use of internet and the socio-demographic characteristics. Pearson correlation test was also performed to determine the relationship between the purpose/activities of using internet, socio-demographics and the perceived level of competence to use computers/internet, with the significance level being  $p < .05$ .

### 3. RESULTS

#### 3.1 Respondents socio-demographic characteristics

In this study, the socio-demographics consisted of: nursing program, the level of the study, gender and age group of the respondents. The findings revealed that 79.1% ( $n = 91$ ) were registered for a Bachelors of Nursing (BN), with most (37.4%) being in the first year, female (90.4%) and under the age of 25 (75.6%) (see Table 1).

**Table 1.** Respondents socio-demographic characteristics ( $n = 115$ )

Socio-demographic characteristics of the respondents		No.	%
Nursing program	Bachelors of Nursing	91	79.1
	Bachelors of Nursing Advanced Practice	24	20.9
Level of the study	1 <sup>st</sup> Year	43	37.4
	2 <sup>nd</sup> year	35	30.4
	3 <sup>rd</sup> year	24	20.9
	4 <sup>th</sup> year	13	11.3
Gender	Male	11	9.6
	Female	104	90.4
Age group	Under 20	29	25.2
	From 21 to 25	58	50.4
	From 26 to 30	6	5.2
	More than 30	22	19.1

#### 3.2 Perceived competency level to use computers and internet

In order to establish the competency level of respondents, they were asked to rate their computer competency. The respondents reported various computer competency levels, with one third (32.2%) having an intermediate level of skill, and slightly less (29.6%) being advanced, and 87% reporting that their ability to use the internet was either good or very good. A Pearson correlation test was run to establish the relationship between the perceived computer use level and

the ability to use the internet, and was significant ( $r = 0.603$ ,  $p < .000$ ).

Kruskal-Wallis test was performed to establish the associations between socio-demographics, and the perceived competency level to use computers and internet. There was a statistically significant association between the perceived computer competence level and nursing programme, with the mean rank of 61.38 for Bachelors of nursing and 45.17 for Bachelors of Nursing Advanced Practice ( $\chi^2 = 4.838$ , d.f

= 1,  $p = .028$ ). There was no other significant association between the perceived level of using computer/Internet and the socio-demographic variables of age and gender (see Table 2).

### 3.3 The reasons for using the computer and internet

The findings from this study indicated that the students used the internet for various reasons, including academic-related activities (96.5%,  $n = 111$ ), finding personal information (86.1%,  $n = 99$ ), and communicating with other people (82.6%,  $n = 95$ ). Other activities were listening to music and watching videos online, getting the latest news or weather, shopping online as well as performing working related activities (see Figure 1).

Table 3 shows the relationship between the reasons for using the computer and internet, socio-demographics, and perceived level of competency of using computer/Internet. It was observed that the level of computer competence was significantly correlated with doing work-related activities ( $r = .186$ ,  $n = 115$ ,  $p = .046$ ), and other personal activities such as having pleasure and fun ( $r = .247$ ,  $n = 115$ ,  $p = .008$ ), getting the latest news and the weather ( $r = .290$ ,  $p = .002$ ), and finding personal information ( $r = .281$ ,  $p = .002$ ). It was also noted that the ability to use the internet was significantly correlated to watching video online ( $r = -.202$ ,  $p = .031$ ), and listening to music one ( $r = -.199$ ,  $p = .033$ ). None of the socio demographics was significantly correlated to the use of computers/Internet with doing academic-related activities nor communicating with other people.

**Table 2.** Socio-demographics and perceived level of competence to use a computer and the internet

			N	Mean Rank	$\chi^2$	df	p value
The perceived level of competency as computer users	Nursing programme	BN	91	61.38	4.839	1	.028*
		BNAP	24	45.17			
	Year of the study	1st Year	43	51.00	4.790	3	.188
		2nd Year	35	65.16			
		3rd Year	24	63.15			
		4th Year	13	52.38			
	Gender	Male	11	61.82	0.172	1	.679
		Female	104	57.60			
	Age group	Under 20	29	60.62	6.897	3	.075
		20 to 25 years	58	63.32			
		26 to 30 years	6	44.00			
		More than 30	22	44.34			
Perceived ability to use internet	Nursing programme	BN	91	55.55	2.992	1	.084
		BNAP	24	67.27			
	Year of the study	1st Year	43	62.73	2.054	3	.561
		2nd Year	35	57.03			
		3rd Year	24	52.92			
		4th Year	13	54.35			
	Gender	Male	11	57.45	0.004	1	.949
		Female	104	58.06			
	Age group	Under 20	29	49.53	6.386	3	.094
		20 to 25 years	58	57.06			
		26 to 30 years	6	74.08			
		More than 30	22	67.25			

\* $p < .05$

### 3.4 Academic activities conducted on the internet

The findings from this study indicated that students used internet to exchange experiences and information via synchronous and asynchronous teleconferencing and discussion lists (97.4%,  $n = 112$ ), for communicating with the lecturer

(79.1%,  $n = 91$ ), collecting and analyzing data (67.8%,  $n = 78$ ), accessing internet placed courses (56.5%,  $n = 65$ ) and their component (42.6%,  $n = 49$ ). Other activities included online admission, course registration, tuition payment, administrative tasks, database browsing, thematic student-

to-student correspondence, including students from abroad, getting support, and using electronic encyclopaedias (see Figure 2).

Pearson correlation test was conducted to establish the relationship between academic activities performed by the respondents, their socio-demographic characteristics, and the

perceived level of competence to use computer/ ability to use the internet (see Table 4). The nursing program was significantly corrected with access to online placed courses ( $r = -.218, p = .019$ ), access to internet sites for course content only ( $r = -.218, p = .019$ ) and for administrative tasks ( $r = -.213, p = .022$ ).

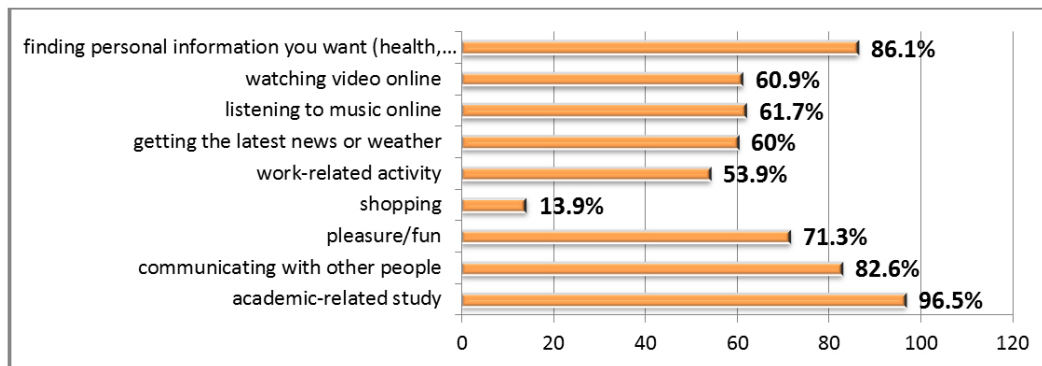


Figure 1. Reasons for using the computer and internet

Table 3. The reasons for using the computer and internet and socio-demographics

Socio-demographic characteristics	Academic-related studies	Communicating with other people	Pleasure & Fun	Shopping	Work-related activities	Getting the latest news & Weather	Listen to music online	Watching video online	Finding personal information
Nursing program	.097	-.047	-.291**	-.033	.003	-.061	-.212*	-.290**	-.041
Year of study	-.035	.163	.222*	-.049	-.013	.154	.100	.083	.197*
Age	.093	.095	-.237*	-.028	-.028	-.038	-.154	-.247**	-.039
Gender	.100	.085	.127	-.031	.115	-.084	.048	.103	.211*
Level of computer competence	.069	.127	.247**	.060	.186*	.290**	.112	.091	.281**
Ability to use the internet	-.182	-.168	-.401**	-.163	-.022	-.363**	-.199*	-.202*	-.200*

\*  $p < .05$ . \*\*  $p < .01$ .

The perceived level of competence to use a computer was significantly correlated with a number of variables including: communicating with lecturers ( $r = 0.458, p < .000$ ); and browsing databases ( $r = .307, p = .001$ ). It was also noted that the ability to use the internet was significantly correlated with access to internet placed courses ( $r = -.366, p < .000$ ), access to the web for information about the course content ( $r = -.366, p < .000$ ), and communicating with the lectures ( $r = -.375, p < .000$ ). Other correlations were also noted between age, gender, and year of the study with academic activities performed on internet (see Table 4).

### 3.5 Awareness of the electronic resources on internet and search engines used

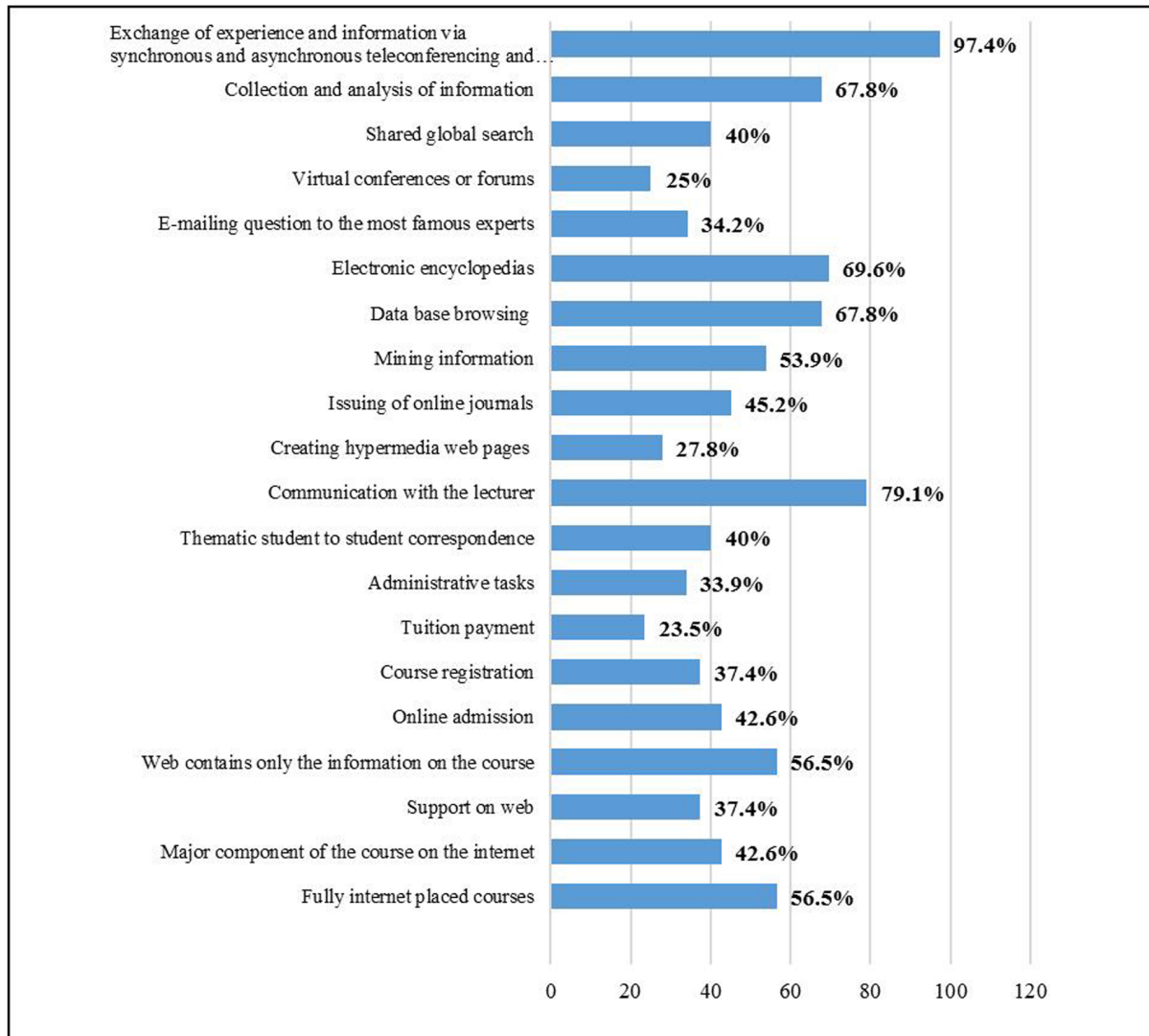
Most respondents (90.4%,  $n = 104$ ) were aware of the availability of the electronic resources. Apart from being aware of the presence of electronic resources that could be accessed

anywhere, the majority (89.6%,  $n = 103$ ) were aware that these resources could be accessed through the University. The Chi-square test indicated that the awareness of electronic resources was significantly associated with library orientation ( $\chi^2 = 22.992, d.f = 3, p = .001$ ). It was also noted that their awareness of the ability to access the electronic resources at the University was significantly associated with the perceived level of competency as a computer user ( $\chi^2 = 11.747, d.f = 0.022$ ), as well as the ability to use the internet ( $\chi^2 = 16.381, d.f = 3, p = .003$ ). These results indicate the importance computer and internet literacy in using electronic resources among nursing students.

The findings from this study indicated that respondents became aware of the existence of electronic resources through a number of sources, namely: their library orientation (62.6%,  $n = 72$ ); fellow students (60.9%,  $n = 70$ ); lecturers (53.9%,

n = 62), Google Scholar (48.7%, n = 56), library web page (40.9%, n = 47), and Yahoo website (20.9%, n = 24). Table 5 indicated that there were significant associations between the source of information and the following: library orientation and the ability to use the internet ( $\chi^2 = 10.203$ , d.f = 3,  $p = .012$ ); lecturers and the perceived competence level as

computer users ( $\chi^2 = 12.913$ , d.f = 4,  $p = .008$ ), the library web page and nursing programmes ( $\chi^2 = 7.352$ , d.f = 1,  $p = .009$ ), library and perceived level of computer competence ( $\chi^2 = 10.646$ , d.f = 4,  $p = .024$ ) while Google scholar as a source of information was significantly associated with the nursing programmes ( $\chi^2 = 6.816$ , d.f = 1,  $p = .011$ ).



**Figure 2.** Academic activities performed on the internet (n = 115)

The respondents in this study used various search engines, with most (96.5%, n = 111) use Google, followed by Yahoo (45.2%, n = 52) and Ask used by 18.3% (n = 21). Other search engines (Info Space, MSM, and Alta Vista) were each used by less than 10% of respondents.

Fisher’s exact test was conducted to establish any differences between the year of the study and their use of Google and Yahoo as search engines, and was not significant for either: Google (Fisher’s exact test value of 1.733,  $p$ -value of .724)

and for Yahoo (Fisher’s exact test value of 3.534,  $p = .319$ ) (see Figure 3).

**3.6 The use of social media sites**

Respondents in this study use various social networking applications with Facebook being the most used (77.4%, n = 89). This was followed by Twitter which was used by less than a quarter of respondents (24.3%, n = 28). Other social networking sites had less than 10% reported usage (see Figure 4).

**Table 4.** Academic activities performed on the internet and socio-demographics

	Nursing program	Year of the study	Age	Gender	Perceived level of computer competence	Ability to use internet
Fully internet placed courses	-.218*	-.048	-.257**	.081	.180	-.366**
Major component of the course on internet	-.052	.115	-.057	-.257**	.019	-.020
Support on the Web	-.115	.111	-.080	-.274**	.117	-.069
Web contains only the information on the course	-.218*	-.048	-.257**	.081	.180	-.366**
Online admission	-.052	.115	-.057	-.257**	.019	-.020
Course registration	-.115	.111	-.080	-.274**	.117	-.069
Tuition payment	-.093	-.020	-.174	-.314**	.107	-.112
Administrative tasks	-.213*	.077	-.149	-.254**	.022	.018
Thematic student to student correspondence	-.182	.039	-.246**	-.078	.228*	-.199*
Communication with the lecturer	-.120	.007	-.165	-.047	.458**	-.363**
Creating hypermedia web pages	-.080	.085	-.128	-.129	.161	-.118
Issuing of online journals	-.175	.057	-.192*	-.107	.109	-.166
Mining information	-.047	-.198*	-.088	-.077	.184*	-.099
Data base browsing	-.219*	-.082	-.257**	-.043	.307**	-.215*
Electronic encyclopaedias	-.113	-.043	-.158	-.109	.340**	-.375**
Emailing question to the most famous experts	-.016	.022	-.012	-.322**	.046	-.065
Virtual conferences or forums	-.097	.112	-.050	-.192*	-.106	-.033
Shared global search	-.175	.048	-.125	-.238*	-.002	-.037
Collection and analysis of information	.010	-.078	-.119	.026	.025	-.029
Exchange of experience and information via synchronous and asynchronous teleconferencing and discussion list	.093	.136	-.004	-.031	.210*	-.183

\*  $p < .05$ ; \*\*  $p < .01$ .

**Table 5.** Awareness of electronic resources, year of the study, nursing program, and competence level to use computers/Internet

	Year of the study			Nursing programmes			Competence level as computer user			Ability to use the internet		
	$\chi^2$	d.f	$p$	$\chi^2$	d.f	$p$	$\chi^2$	d.f	$p$	$\chi^2$	d.f	$p$
Library orientation	1.324	3	.741	3.646	1	.063	8.335	4	.071	10.203	3	.012*
Lecturer	0.782	3	.853	0.187	1	.818	12.913	4	.008*	4.429	3	.204
Fellow students	3.071	3	.389	0.082	1	.817	1.174	4	.903	1.687	3	.688
The library web page	1.638	3	.654	7.352	1	.009*	10.646	4	.024*	6.501	3	.076
Google scholar	1.019	3	.809	6.816	1	.011*	7.156	4	.116	6.997	3	.058
Yahoo	2.987	3	.400	0.324	1	.596	4.496	4	.327	3.473	3	.282

\*  $p < .05$ .

The findings from this study indicated that Facebook and Twitter were mainly used as socio-networking sites. The Chi-square test indicated significant associations between the use of Facebook with the following: nursing programmes ( $\chi^2 = 9.350$ , d.f = 1,  $p = .002$ ), age group ( $\chi^2 = 18.265$ , d.f = 3,  $p < .000$ ), and the ability to use the internet ( $\chi^2 = 12.498$ , d.f = 3,  $p = .006$ ). The use of Twitter was significantly associated with student's perceived level of competence as computer

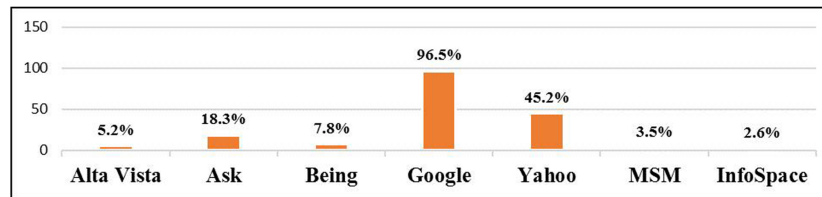
users ( $\chi^2 = 15.209$ , d.f = 4,  $p = .003$ ), and the ability to use the internet ( $\chi^2 = 15.711$ , d.f = 3,  $p = .001$ ) (see Table 6). The perceived level of competency as computer users and the ability to use the internet is important to use socio-media such as Facebook and Twitter. The age group and nursing programmes were associated with the use of Facebook.

**3.7 Constraints encountered while using the internet facilities**

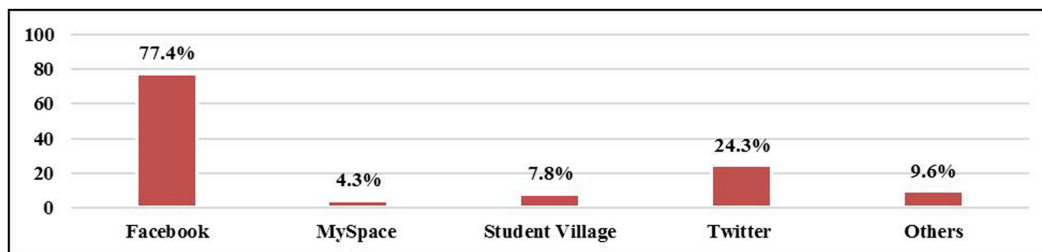
Respondents from this study reported various constraints in using Internet facilities: restricted access to certain networking sites (62.6%, n = 72), very slow internet connection (takes too long to load pages) (55.7%, n = 64); very little training on how to use Internet facilities (38.3%, n = 44); very few computers on which to access the internet (37.4%, n = 43), and no training on how to use internet facilities (27.0%,

n = 31). A Chi-square test was run to establish the association between the socio-demographics of the respondents and the constraints encountered, and found no significant associations.

However, the perceived level of competence to use the computers was significantly associated with very little training in the use of internet facilities ( $\chi^2 = 23.546$ , d.f = 4,  $p < .000$ ), and restricted access to certain network sites ( $\chi^2 = 33.025$ , d.f = 4,  $p < .000$ ). It was also noted that there were significant associations between a limited ability to use the internet and very little training on how to use such facilities ( $\chi^2 = 7.829$ , d.f = 1,  $p = .038$ ); no training on how to use internet facilities ( $\chi^2 = 10.505$ , d.f = 3,  $p = .012$ ), and restricted access to certain network sites ( $\chi^2 = 7.710$ , d.f = 3,  $p = .039$ ) (see Table 7).



**Figure 3.** Search engines used by the respondents



**Figure 4.** Social media used by respondents

**Table 6.** Chi-square test between the use of Facebook/Twitter and socio-demographics

	Facebook			Twitter		
	$\chi^2$	d.f	$p$	$\chi^2$	d.f	$p$
Nursing programme	9.350	1	.002**	0.971	1	.324
Year of the study	0.056	3	.996	4.886	3	.180
Gender	0.136	1	.712	0.251	1	.616
Age group	18.265	3	.000**	2.058	3	.560
Level of competence as computer users	5.564	4	.234	15.209	4	.003**
Ability to use the internet	12.498	3	.006**	15.711	3	.001**

\*\*  $p < .01$ .



**Table 7.** Chi-square test of constraints encountered by the respondents and perceived level of competence to use internet/Internet

	Perceived level of competence to use computers			Ability to use the internet		
	$\chi^2$	d.f	p	$\chi^2$	d.f	p
Very few internet computers	5.429	4	.250	4.714	3	.195
Very slow internet connection (takes too long load pages)	8.555	4	.064	3.504	3	.347
Very little training on how to use internet facilities	23.546	4	.000**	7.829	3	.038*
No training on how to use internet facilities	9.296	4	.051	10.505	3	.012*
Restricted access to certain networking sites	33.025	4	.000**	7.710	3	.039*

\*  $p < .05$ . \*\*  $p < .01$ .

#### 4. DISCUSSION

Computer and internet literacy are important as they enable nursing students to use the internet. In this study, students had varying levels of competence to use the computer and internet, this being similar to a study by Deltsidou, Gesouli-Voltyraki, Mastrogiannis and Noula,<sup>[31]</sup> where undergraduate nursing students were requested to rank their computer usage competency. It was observed that 12.6% reported a very good knowledge of personal computer usage, 30.0% had a good knowledge, 27.4% had sufficient knowledge, while 24.8% had a beginner's knowledge. The findings from a study conducted by Bond<sup>[32]</sup> found that 30.8% of respondents viewed themselves as internet experts in 2001, this number increasing to 40% in 2007. Of the 54.4% who viewed themselves as Good at using the internet in 2001, the number increased to 53.4% in 2007. However, a significant percentage of students (68.8%) in 2001 said they had Basic skills in using internet compared to 84.1% in 2007.

The students in this study reported accessing the internet for various reasons, including conducting academic-related activities, communication and accessing online resources. The majority of nursing students were aware of the existence of the electronic resources on the internet and at the University (90.4% and 89.6% respectively). Similar to this study, Okon's<sup>[33]</sup> findings show that the respondents relatively access and use online resources. However, studies have shown that not all students are aware of the availability of electronic resources, which negatively impacts on their usage.<sup>[34]</sup>

As indicated by Tella, Tella, Ayeni and Omoba,<sup>[35]</sup> learners' capacity to collect and analyse data adequately is a transferable skill that is valuable for their future, with search strategies being essential for students to complete their tasks.<sup>[36]</sup> The findings from this study revealed that a number of search engines were used by the respondents, the majority using Google (96.5%), these findings being similar to Malik and

Mahmood's<sup>[15]</sup> study, who found that the majority of respondents (97%) also used Google search engine. Similarly, a study by Experian Hitwise<sup>[37]</sup> found that Google was the leading search engines used by 65.38% of the study respondents.

One of the realities of today's information age is the increased use of social media sites. While some nurses regard these sites as being useful for teaching and learning, others have criticised them for being devoid of any bearing on academia. Within this context, the majority of respondents (77.4%) used Facebook for social networking, which was followed by Twitter (24.3%). A study by Kheswa<sup>[16]</sup> produced results similar, with 78% of students having used Facebook, and 26.8% Twitter. A study by Kader<sup>[38]</sup> also found Facebook to be the social networking site used by most respondents (80%). According to Gómez, Roses and Farias,<sup>[39]</sup> most students access these social networks in order to maintain contact with friends and to make new ones. The use of social networks in education promotes teamwork and collaboration between students, teachers and experts.

This study indicated that a number of constraints hindered the effective use of computers and internet, and included too few computers connected at the university to accommodate all the students, little or no training on how to use the internet, slow internet connections, and restricted access to certain network sites. In this study, it surfaced that support is pivotal to the continued success and growth of using computers and the internet in nursing education. The success of internet in teaching and learning not only depend on the availability of materials, but also on effective orientation and capacity building of nursing students in computer/ internet literacy.

#### 5. CONCLUSION

The use of the internet in educating healthcare professionals is very important in the digital era. The findings from this

study demonstrated that while nursing students use computers and the internet for learning purposes, many do not have the knowledge and skills to use them effectively. The success of technology in education depends on the ability of students and teachers to use computer and internet for academic purposes. As many of the students come across computers and the internet for the first when they get to university, it is essential to support them, provide adequate infrastructures, and ensure that teachers use teaching methods that put students at

the centre of their learning. It is recommended that nursing students be trained in basic and advanced computer skills, and that nurse educators be capacitated with the required knowledge and skills to educate students on safe internet practices, as the use of social networking sites might expose the privacy of users and confidential information.

## CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

## REFERENCES

- [1] Bughin J, Corb L, Manyika J, et al. The impact of Internet technologies: Search 2011 [cited 2017 23 June]. Available from: [https://www.mckinsey.com/-/media/mckinsey/dotcom/client\\_service/High%20Tech/PDFs/Impact\\_of\\_Internet\\_technologies\\_search\\_final2.aspx](https://www.mckinsey.com/-/media/mckinsey/dotcom/client_service/High%20Tech/PDFs/Impact_of_Internet_technologies_search_final2.aspx)
- [2] Linn MC. Internet environments for science education: Routledge; 2013.
- [3] Buabeng-Andoh C. Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. *International Journal of Education and Development using Information and Communication Technology*. 2012; 8(1): 136-55.
- [4] Rüzgar NS. A research on the purpose of Internet usage and learning via the Internet. *TOJET: The Turkish Online Journal of Educational Technology*. 2005; 4(4): 27-32.
- [5] Wolf DM, Wenskovitch J, Anton BB. Nurses' use of the Internet and social media: Does age, years of experience and educational level make a difference? *Journal of Nursing Education and Practice*. 2015; 6(2): 68-75. <https://doi.org/10.5430/jnep.v6n2p68>
- [6] Chaffin AJ, Maddux CD. Internet teaching methods for use in baccalaureate nursing education. *CIN: Computers, Informatics, Nursing*. 2004; 22(3): 132-42.
- [7] Hallila LE, Al Zubaidi R, Al Ghamdi N, et al. Nursing students' use of Internet and Computer for their Education in the College of Nursing. *International Journal of Nursing & Clinical Practices*. 2014; 1(108). <https://doi.org/10.15344/2394-4978/2014/108>
- [8] Guohong G, Ning L, Wenxian X, et al. The study on the development of Internet-based distance education and problems. *Energy Procedia*. 2012; 17: 1362-8. <https://doi.org/10.1016/j.egypro.2012.02.253>
- [9] Daggett WR. *Preparing Students for Their Technological Future*. Washington: International Center for Leadership in Education; 2010.
- [10] Koehler N, Vujovic O, McMenamin C. Healthcare professionals' use of mobile phones and the internet in clinical practice. *Journal of Mobile Technology in Medicine*. 2013; 2(1S): 3-13.
- [11] Rolls K, Hansen M, Jackson D, et al. Using Online Focus Groups to Explore Why Healthcare Professionals Belong to a Practice-Focused Virtual Community. June 2017; 15(1). Available from: [https://www.aci.health.nsw.gov.au/\\_data/assets/pdf\\_file/0009/306738/Kaye\\_Rolls\\_QM\\_2015\\_online\\_focus\\_groups\\_10042015.pdf](https://www.aci.health.nsw.gov.au/_data/assets/pdf_file/0009/306738/Kaye_Rolls_QM_2015_online_focus_groups_10042015.pdf)
- [12] Boulos MNK, Wheeler S, Tavares C, et al. How smartphones are changing the face of mobile and participatory healthcare: an overview, with an example from eCAALYX. *Biomedical Engineering Online*. 2011; 10(1): 1-14.
- [13] Hesse B. Trust and sources of health information. *Arch Intern Med*. 2005; 165: 2618-24. PMID:16344419 <https://doi.org/10.1001/archinte.165.22.2618>
- [14] Luambano I, Nawe J. Internet use by the student at the University of Daresalam. *Library HiTech News*. 2004; 10: 13-7.
- [15] Malik A, Mahmood K. Web Search Behavior of University Students: A Case Study at the University of Punjab. *Webology*. 2009; 6(2): 1-14.
- [16] Kheswa SE. Use of the internet by undergraduate third-year students of the Faculty of Humanities, Development and Social Sciences at the University of KwaZulu-Natal, Pietermaritzburg campus [Masters dissertation]. Pietermaritzburg: University of KwaZulu-Natal; 2010.
- [17] Shezi MS. An investigation into the use of the internet by students at St. Joseph's Theological Institute, Kwazulu-Natal, South Africa [Masters of Information Studies (MIS)]. Pietermaritzburg, South Africa: University of KwaZulu-Natal; 2005.
- [18] Balakrishnan M. Academic use of internet among undergraduate students: A preliminary case study in a Malaysian University. *International Journal of Cyber Society and Education*. 2010; 3(2): 171-8.
- [19] Republic of South Africa. National Integrated ICT Policy White Paper 2016 [cited 13 March 2018]. Available from: [https://www.dtps.gov.za/images/phocagallery/Popular\\_Topic\\_Pictures/National\\_Integrated\\_ICT\\_Policy\\_White.pdf](https://www.dtps.gov.za/images/phocagallery/Popular_Topic_Pictures/National_Integrated_ICT_Policy_White.pdf)
- [20] INONAFRICA. The digital divide in South Africa's higher education sector: why public internet access is important in the context of tertiary education 2017 [cited 2018 13 March]. Available from: <http://www.inonafrika.com/2017/08/07/digital-divide-south-africas-higher-education-sector-public-internet-access-important-context-tertiary-education/>
- [21] Memela L. Promoting UKZNTube in Health Sciences Education. *UKZNNdaba Online [Internet]*. 2015; 3(44). Available from: <http://ndabaonline.ukzn.ac.za/UkzndabaStory/Vol3-Issue44/Promoting%20UKZNTube%20in%20Health%20Sciences%20Education/>
- [22] Harerimana A, Mtshali NG. A descriptive study on the utilization of internet as an academic tool among undergraduate nursing students, at a selected University In KwaZulu-Natal [Dissertation]: University of KwaZulu-Natal; 2013.
- [23] Richwine M, McGowan J. A rural virtual health sciences library project: research findings with implications for next generation library services. *Bulletin of the Medical Library Association*. 2001; 89(1): 37-44. PMID:11209799
- [24] Khalid MS, Pedersen MJL. Digital exclusion in higher education contexts: A systematic literature review. *Procedia-Social and Behavioral Sciences*. 2016; 228: 614-21. <https://doi.org/10.1016/j.sbspro.2016.07.094>

- [25] Verhey MP. Information literacy in an undergraduate nursing curriculum: development, implementation, and evaluation. *Journal of Nursing Education*. 1999; 38(6): 252-9. PMID:10512465
- [26] Lathey J, Hodge B. Information seeking behavior of occupational health nurses: how nurses keep current with health information. *Journal of the American Association of Occupational Health Nurses*. 2001; 49(2): 87-95.
- [27] Bachman J, Panzarine S. Enabling nursing students to use the information superhighway. *Journal of Nursing Education*. 1998; 37(4): 155-61. PMID:9570414
- [28] Mccaughan D, Thompson C, Cullum N, et al. Acute care nurses' perceptions of barriers to using research information in clinical decision-making. *J Adv Nurs*. 2002; 39(1): 46-60. <https://doi.org/10.1046/j.1365-2648.2002.02241.x>
- [29] Mccannon M, O'neal P. Results of a national survey indicating information technology skills needed by nurses at time of entry into the work force. *Journal of Nursing Education*. 2003; 42(8): 337-40. PMID:12938895
- [30] Davison D, Naguszewski T, Piasta M, et al. Nursing faculty and use of Web 2.0. *Journal of Nursing Education and Practice*. 2013; 3(8): 13-17. <http://dx.doi.org/10.5430/jnep.v3n8p13>
- [31] Deltsidou A, Gesouli-Voltyraki E, Mastrogiannis D, et al. Undergraduate nursing students' computer skills assessment: a study in Greece. *Health Science Journal*. 2010; 4(3): 182-4.
- [32] Bond C. Surfing or still drowning? Student nurses' Internet skills. 2010 [cited 2012 24 September]. Available from: <http://eprints.bournemouth.ac.uk/12601/1/CBond-NET-preprint.pdf>
- [33] Okon AE. The Electronic Library Emerald Article: Internet access and use: A study of undergraduate students in three Nigerian universities. *The Electronic Library*. 2010; 28(4): 555-67. <https://doi.org/10.1108/02640471011065373>
- [34] Ming-der W, Ssu-Tsen Y. Effects of Undergraduate Student Computer Competence on Usage of Library Electronic Collections. *Journal of Library and Information Studies*. 2012; 10(1): 1-17.
- [35] Tella A, Tella A, Ayeni C, et al. Self-Efficacy and Use of Electronic Information as Predictors of Academic Performance. *Electronic Journal of Academic and Special Librarianship* [Internet]. 2012; 8(2). Available from: [http://southernlibrarianship.icaap.org/content/v08n02/tella\\_a01.html](http://southernlibrarianship.icaap.org/content/v08n02/tella_a01.html)
- [36] Tseng SC, Liang JC, Tsai CC. Students' self-regulated learning, online information evaluative standards and online academic searching strategies. *Australasian Journal of Educational Technology*. 2014; 30(1): 106-31.
- [37] Experian Hitwise. Experian Hitwise reports Bing-powered share of searches at 29 percent in October 2011 [cited 2012 23 February]. Available from: <http://www.hitwise.com/us/about-us/press-center/press-releases/bing-powered-share-of-searches-at-29-percent>
- [38] Kader CB. A study on how university students in Durban, KZN, use the Internet during their spare time [Dissertation]. Durban: University of KwaZulu-Natal (UKZN); 2007.
- [39] Gómez M, Roses S, Farias P. The Academic Use of Social Networks among University Students. *Scientific Journal of Media Education*. 2012; 19(38): 131-8.