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Gender differences amongst student attitudes towards the use of a virtual learning environment as an advertising platform

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Purpose of the study: By including advertisements in VLEs, both academically and commercially, HEIs can potentially reduce the significant financial costs associated with the implementation, utilisation and maintenance required for their chosen VLEs, without decreasing the value of the service provided, while simultaneously providing a source of long-term sustainable revenue for HEIs. Consequently, the primary objective of this study was to determine whether gender differences exist among students' attitudes towards the use of a VLE with the presence of advertisements at a South African university of technology.

Design/methodology/approach: The sampling frame for this study comprised a public registered South African university of technology. A non-probability convenience sample of 379 students was used. A hand-delivered, self-administered questionnaire was distributed to full-time students during class time at the chosen HEI.

Findings: There was a statistically significant difference found between male and female students at the chosen South African university of technology in terms of the perceived usefulness of VLEs. There is no statistically significant difference between male and female students' self-efficacy, technology experience, satisfaction, perceived ease of use, perceived usefulness, attitudes towards the use of a VLE without the presence of advertisements and attitudes towards the use of a VLE with the presence of advertisements.

Recommendations/value: Not only do VLEs, being web-based, provide a means for HEIs to generate long-term revenue, but they have the capacity to become open digital platforms for marketers to take advantage of. With the use of these VLEs, marketers may find it easier to reach their target audiences in a more focused approach when placing advertisements on this platform, while HEIs can use the income generated to cover the cost of any technological advancements that may be required, without having to increase student fees.

Managerial implications: The management of HEIs need to decide if they would like to consider this means of revenue generation and see if it will indeed be as beneficial as what the theory suggests. In order to avoid

any potential financial risks associated with the implementation of advertisements on VLEs, HEIs can engage in trial run projects with a willing organisation to analyse the viability of this proposed initiative.

Keywords

Gender differences; perceived ease of use; perceived usefulness; self-efficacy; technology experience

JEL Classification: M31, M37

1. INTRODUCTION

Watson (2006) postulates that technology has significantly altered the higher education landscape, particularly the introduction of virtual learning environments (VLEs), which have been employed by several HEIs in an attempt to enhance and support student learning. Browne *et al.* (2006) add that the majority of HEIs, situated in the United Kingdom (UK) and around the globe, now support students' learning via VLEs. Owing to the costs associated with implementing, operating and updating VLEs, HEIs that make use of VLEs may find it financially beneficial to use these VLES as a means to increase revenue (Ogba *et al*., 2012).

Browne (2010) highlights the importance for HEIs, around the world and in South Africa in particular, to investigate austerity measures and ways in which they can increase revenue if they wish to survive. Consequently, the VLEs already being used in several HEIs may be the answer. Through the introduction of advertisements onto VLEs, HEIs may be able to reduce the significant financial costs associated with the use of VLEs, without decreasing the value of the service provided, in turn providing a source of long-term sustainable revenue. This highlights the need for HEIs to consider the integration of advertisements onto their chosen VLEs, although there is a paucity in research investigating how the users of VLEs, mainly students, will respond to the presence of advertisements on VLEs (Ogba *et al*., 2012).

Although a study has been conducted on predicting students' attitudes towards advertising on HEI VLEs (Ogba *et al*., 2012), it was only undertaken in the United Kingdom. Other studies remotely related were mainly focused on students' attitudes towards e-learning and did not investigate students' attitudes towards the use of a VLE with the presence of advertisements (Mehra & Omidian, 2011; Pilli *et al*., 2014; Al-Said, 2015; Rhema & Miliszwska, 2014). Ogba *et al*. (2012) highlight the importance of developing an understanding of the perceptions of students towards VLEs, as attitudes play an integral role in the adoption or rejection of new technologies and initiatives. Consequently, HEIs may consider the implementation of

advertisements in the VLEs that are currently being used for teaching and learning within HEIs, although there is a need to develop a deeper understanding of the students who are enrolled at these HEIs, attitudes towards the use of VLEs with the presence of advertisements.

According to Sobieraj and Krämer (2020), not only do males and females accept and use technology differently from each other, but their self-perceptions concerning technology also differ, where women are more likely to see themselves as less capable with regard to the use of technology. As gender is theorised to be a significant variable in explaining the technology acceptance behaviour of individuals (Goswami & Dutta, 2016), this study aims to investigate if a difference exists between male and female students' attitudes towards the use of a VLE as an advertising platform at a South African university of technology.

2. LITERATURE REVIEW

Attitudes encompass the feelings, tendencies or evaluations individuals possess in relation to a product, service or particular behaviour, which may be positive or negative in nature (Parumasur & Roberts-Lombard, 2013). Furthermore, attitudes are ingrained individual responses, which are continuous and unchanging and in turn determine the level of favourable or unfavourable feelings individuals posses with regard to emotional, rational and behavioural components (Zikmund & Babin, 2013). Alternatively, although an attitude is relatively consistent, it may change at any point in time, indicating that an attitude is not permanent (Schiffman & Kanuk, 2014).

Attitudes may be influenced by mass media advertising, direct marketing efforts or word-of-mouth communication (Du Plessis & Rousseau, 2007; Schiffman & Kanuk, 2014). As such, this study contributes towards the literature concerning students' attitudes towards advertising on VLEs, in both the South African and global context.

The below sections delineate on the technology acceptance model (TAM) of Davis *et al.* (1989), including self-efficacy and technology experience and the factors of students' adoption of VLEs in blended learning, namely perceived ease of use, perceived usefulness and satisfaction and the presence of advertisements on virtual learning environments.

2.1 Theoretical foundation

The TAM of Davis *et al.* (1989) was employed as the theoretical grounding for this study to investigate the association between student factors, which include self-efficacy and technology experience and the factors of students' adoption of VLEs in blended learning,

namely perceived ease of use, perceived usefulness and satisfaction, with students' intentions to use a VLE at a South African university of technology.

According to Suki and Suki (2011) and Fathema *et al.* (2015), when an individual views technology as easy to use, there is an increased likelihood that these individuals will perceive technology as useful, leading to positive attitudes towards the use of a particular technology and the increased likelihood to use the technology in question, similarly influencing the actual use of the technology, namely a VLE.

2.1.1 Self-efficacy

Akhtar (2008) identifies self-efficacy as an individual's perception regarding their competencies and performance levels at various life stages, which may contribute to instances of life changing moments. With regard to technology self-efficacy, Compeau and Higgins (1995) and Akhtar (2008) propose that it is an individual's self-assessment of their capability to make use of technology, such as computers, to complete specific tasks. Consequently, the greater an individual's computer self-efficacy is, the greater their use of computers and technology will be (Compeau & Higgins, 1995; Al-Busaidi, 2013). Therefore, a student's perception of their own self-efficacy, in terms of the use of technology, is believed to influence their intention to use and engage in the use of a VLE, where computerised self-efficacy is seen to be greatly related to the acceptance of a VLE (Roca *et al.,*2006; Cheng, 2011). In conclusion, students that have higher levels of self-efficacy with regard to VLEs are believed to be more prone to use VLEs, whereas students who have lower levels of self-efficacy may avoid using VLEs altogether (Lee, 2006; Hsia *et al.,*2008; Yuen & Ma, 2008; Moghadam & Bairamzadeh, 2009).

Based on the findings of Sawari and Masor (2013), no significant difference existed between male and female students' general self-efficacy and there was a very weak to negligible correlation between general self-efficacy and gender. Yau and Leung (2016) assert that there is no significant difference between male and female students' technology self-efficacy. Consequently, this study proposed to determine if a significant difference exists between male and female students and their perceived self-efficacy towards the use of a VLE with the presence of advertisements.

H_1: *No significant difference exists between male and female students and their perceived self-efficacy towards the use of a VLE in the presence of advertisements.*

2.1.2 Technology experience

Technology experience is the term used to describe an individual's exposure to skills, abilities and services that are gained by using technology (Thompson *et al.,* 2006). According to Wan *et al.* (2007), students' technology experience has a significant impact on learning outcomes and learning processes, playing a significant role in how effective students engage with technology in the educational environment (Murshitha & Wickramarachchi, 2016). The more technology experience a student has, the higher the likelihood will be that the students in question will employ the use of technology for educational purposes and activities and the more inclined students would be to perceive technology as useful and an easy tool to use (Al-Busaidi, 2013). Consequently, the more significant a student's technology experience tends to be, the more inclined the students in question will be to demonstrate favourable perceptions towards the usefulness and the ease of use of VLEs (Purnomo & Lee, 2013).

According to Murshitha and Wickramarachchi (2016), there is a strong positive relationship evident between a student's technology experience and their adoption of VLEs. Furthermore, Punnoose (2012) theorises that students with prior e-learning experience and better computer skills are more inclined to use e-learning when the opportunity presents itself. Šumak *et al.* (2011) conclude that students' actual application of technology is strongly influenced by their behavioural intention, which in turn is influenced by their prior experience with certain technologies.

Schumacher and Morahan-Martin (2001) postulate that females tend to display more negative attitudes towards the use of new technologies, compared to their male counterparts, reporting higher levels of discomfort and incompetence in relation to computers and the internet. Goswami and Dutta (2016) add that in terms of e-learning applications, such as VLEs, gender was deemed a significant factor, where females are more inclined to experience technical challenges and feel that using technology is a risk. As such, this study aimed to determine if a significant difference exists between male and female students and their technology experience with the use of a VLE with the presence of advertisements.

H_2: *No significant difference exists between male and female students and their technology experience with the use of a VLE with the presence of advertisements.*

2.1.3 Perceived ease of use and perceived usefulness

Pilli *et al.* (2014) postulate perceived usefulness and perceived ease of use as antecedents that significantly influence students' attitudes towards the use of e-learning, which is in line with the findings of Davis (1989) and Al-Adwan *et al.* (2013). Although a student may initially deem a given technological innovation as useful upon first interactions with the innovation in question, the student may discover that it may be difficult to use after a period of use, which in turn influences their degree of acceptance (Kjeldskov *et al.* 2004). Subawa *et al.* (2021) conclude that accepting technology, such as a VLE, is dependent on an individual's needs, which will in turn influence their perceived ease of use and usefulness of a particular technology, such as a VLE. Based on this, the study aims to determine if a significant difference exists between male and female students and their perceived usefulness and perceived ease of use of a VLE with the presence of advertisements.

H_3: *No significant difference exists between male and female students and their perceived usefulness of a VLE with the presence of advertisements.*

H_4: *No significant difference exists between male and female students and their perceived ease of use of a VLE with the presence of advertisements.*

2.1.4 Satisfaction

Satisfaction is described as the extent to which an individual is pleased or content with a product or service (Delone & McLean, 2003). Similarly, satisfaction is believed to be useful to evaluate the influence of information structures and has been noted as the leading influencer in intention to use technological innovations (Yoon *et al.,* 1995; Negasha, 2003; Kassim *et al.,* 2012). In terms of VLEs, satisfaction may be dubbed the degree to which students may feel pleased or content with the use and implementation of a VLE in its entirety (Sun *et al.,* 2008). Devaraj *et al.* (2003) and Pavlou (2003) conclude that students' have a favourable feeling of satisfaction with regard to VLEs when VLEs are perceived as useful and easy to use. Therefore, this study proposed to determine if a significant difference exists between male and female students and their satisfaction towards the use of a VLE with the presence of advertisements.

H_5: *No significant difference exists between male and female students and their satisfaction towards the use of a VLE with the presence of advertisements.*

2.1.5 The presence of advertisements on virtual learning environments

According to Johnston (2017), VLEs give registered students at HEIs the opportunity to access the same material, at the same time, where the material can remain on the VLE for as long as it is needed. Consequently, VLEs have the potential to become an effective and efficient platform to advertise institutional campaigns and functions, without having to account for the costs associated with the printing of advertisements, which in turn have to be distributed or attached to notice boards, which often go unnoticed or get discarded the moment they are received by the recipients, namely students. Through the implementation of advertisements onto VLEs, there is minimal to no cost involved, given that students have access to the advertisements and can refer to them at any time, which will hopefully increase the extent of exposure and subsequent positive response and participation rate. As suggested by Gong and Maddox (2003), how individuals judge advertisements, both in the traditional sense and on the internet, is done using the same criteria, including how entertaining, informative and useful an advertisement is in relation to how it will influence an individual's purchase decisions. Consequently, if HEIs want to incorporate advertisements onto VLEs that encourage positive student attitudes, they need to ensure that the advertisements are informative and entertaining (Ogba *et al.,* 2012).

Based on the findings of the study conducted by Ogba *et al.* (2012) in the UK at Northumbria University, students who make use of VLEs possess positive attitudes towards the use of VLEs with the presence of advertisements. Unfortunately, there is a paucity of research concerning if a significant difference exists between male and female students and their attitudes towards the use of a VLE with the presence of advertisements.

$H_{6:}$ *No significant difference exists between male and female students and their attitudes towards the use of a VLE without the presence of advertisements.*

$H_{7:}$ *No significant difference exists between male and female students and their attitudes towards the use of a VLE with the presence of advertisements.*

3. METHODOLOGY

The list of 26 publicly, registered HEIs in South Africa (Universities South Africa, 2018) was used as the sampling frame for this research study. For this study, a non-probability convenience sample was employed, which included the use of one HEI, namely a university of technology in Gauteng, South Africa. Owing to time, cost and geographical restrictions, only one HEI, located in the Gauteng province of South Africa, was chosen. Assistance was sought

from lecturers within each of the four faculties, namely the Faculty of Management Sciences, the Faculty of Applied and Computer Sciences, the Faculty of Engineering and the Faculty of Human Sciences at the South African university of technology. The lecturers were contacted and requested to ask their students to participate in the data gathering process by completing the questionnaire. It was highlighted that completion of the questionnaire was strictly voluntary and that no student was to be coerced into completing the questionnaire. Once permission had been granted, a hand-delivered, self-administered questionnaire was distributed to full-time students during class time at the chosen HEI.

A sample size of 400 full-time students was chosen for this research study, who was divided equally between the four faculties within the chosen HEI, thereby allowing a sample size of 100 full-time students per faculty. The sample included 400 full-time registered students at the chosen HEI, aged between 18 and 38 years, from which 379 usable responses were received.

Measuring scales from Ogba *et al*. (2012), Al-Busaidi (2013), Pilli *et al*. (2014) and Dos Santos and Okazaki (2016) were adapted to formulate the questionnaire for this research study. The questionnaire comprised four sections, ranging from Section A to Section D.

The demographic data pertaining to this study was collected in Section A. In order to measure the influence that student factors have on students' intentions to use VLEs, the scale of Al-Busaidi (2013) was adapted to include two constructs, namely student self-efficacy (three items) and technology experience (three items), which were subsequently found in Section B. Using the adapted scale of Al-Busaidi (2013), Section C constituted three constructs used to measure the influence of the factors influencing students' adoption of VLEs in blended learning on students' intentions to use VLEs. The first construct was employed to measure perceived ease of use (three items), the second construct measured perceived usefulness (six items) and the third construct measured student satisfaction (three items). The fourth and last section, Section D, was used to measure students' perceptions regarding the presence of advertisements on VLEs, which was adapted from the scale used by Ogba *et al*. (2012), consisting of eight items. For this study, a six-point Likert scale was employed, which ranged from 1 = strongly disagree to 6 = strongly agree.

4. FINDINGS AND DISCUSSION

As per Table 1, only four of the seven constructs recorded Cronbach's alpha values of more than 0.70. Accordingly, for scales with less than ten items, which is the case for all three constructs that did not obtain a Cronbach's alpha value of 0.70 or more, it is sometimes difficult

to obtain Cronbach's alpha values that are above the recommended 0.70 (Pallant, 2007). Therefore, it is recommended that researchers make use of the inter-item correlation values to determine the reliability of a scale if such a scenario occurs. In addition, the average inter-item correlations were calculated for all the constructs to measure the validity of the scale. For the three constructs that did not obtain a 0.70 or higher Cronbach's alpha value, average inter-item correlations between 0.322 and 0.385 were achieved, indicating that this scale was in fact reliable and valid.

Table 1: Reliability and average inter-item correlation values

	Number of items	Cronbach's alpha	Average inter-item correlation
Self-efficacy	3	0.635	0.385
Technology experience	3	0.866	0.684
Perceived ease of use	3	0.928	0.813
Perceived usefulness	6	0.946	0.745
Satisfaction	3	0.907	0.766
Pre-advert presence	3	0.506	0.322
Post-advert presence	5	0.650	0.384

As per Table 1, higher mean values are associated with greater agreement among the sample students at the chosen South African university of technology. As per Table 2, the number of usable, completed questionnaires is indicated by the valid N.

Table 2: Descriptive statistics

Constructs	Valid N	Mean	Standard deviation
Self-efficacy	379	3.98	1.26
Technology experience	379	4.26	1.20
Perceived ease of use	379	4.09	1.31
Perceived usefulness	379	3.93	1.23
Satisfaction	379	3.91	1.33

Constructs	Valid N	Mean	Standard deviation
Pre-advert presence	379	4.13	1.00
Post-advert presence	379	3.98	1.13

The highest mean values were computed for technology experience (mean = 4.26), pre-advertisement presence (mean = 4.13) and perceived ease of use (mean = 4.09), indicating that students at the chosen South African university of technology have strong positive attitudes towards their technology experience, the use of VLEs without the presence of advertisements and the perceived ease of use of VLEs. Mean values above 3.50 were computed for post-advertisement presence (mean = 3.98), self-efficacy (mean = 3.98), prceived usefulness (mean = 3.93) and satisfaction (mean = 3.91). This suggests that students have positive attitudes towards the use of VLEs with the presence of advertisements, as well as their self-efficacy in terms of using VLEs, the perceived usefulness of VLEs and their satisfaction with the use of VLEs.

The lowest standard deviations were recorded on pre-advertisement presence (St. Dev. = 1.00) and post-advertisement presence (St. Dev. = 1.13), indicating that there was less dispersion in students' reported attitudes towards the use of VLEs without the presence of advertisements and the use of VLEs with the presence of advertisements. Higher standard deviations were recorded for technology experience (St. Dev. = 1.20), perceived usefulness (St. Dev. = 1.23), self-efficacy (St. Dev. = 1.26), perceived ease of use (St. Dev. = 1.31) and satisfaction (St. Dev. = 1.33). This indicates that there was greater dispersion in students' attitudes towards their technology experience, including the perceived usefulness of VLEs, self-efficacy with regard to VLEs, the perceived ease of use regarding VLEs and their satisfaction with VLEs.

According to Table 3, males (n = 179) had strong positive attitudes towards their technology experience (mean = 4.209, St. Dev. = 1.213), perceived ease of use of VLEs (mean = 4.123, St. Dev. = 1.250) and the use of VLEs without the presence of advertisements (mean = 4.088, St. Dev. = 1.011). In addition, males had positive attitudes towards their satisfaction with VLEs (mean = 3.952, St. Dev. = 1.294), VLEs with the presence of advertisements (mean = 3.927, St. Dev. = 1.166), their self-efficacy with regard to VLEs (mean = 3.922, St. Dev. = 1.089) and the perceived usefulness of VLEs (mean = 3.920, St. Dev. = 1.162).

In comparison, females (n = 193) were associated with a numerically higher sense of strong positive attitudes towards their technology experience (mean = 4.307, St. Dev. = 1.201) and

VLEs without the presence of advertisements (mean = 4.181, St. Dev. = 0.980). This was also true concerning their perceived ease of use of VLEs (mean = 4.042, St. Dev. = 1.364), self-efficacy in terms of VLEs (mean = 4.036, St. Dev. = 1.398) and the use of VLEs with the presence of advertisements (mean = 4.032, St. Dev. = 1.107). Furthermore, females had a numerically higher positive attitude towards the perceived usefulness of VLEs (mean = 3.922, St. Dev. = 1.299), but a numerically lower positive attitude towards their satisfaction with VLEs compared to males (mean = 3.839, St. Dev. = 1.375).

Table 3: Gender differences

Constructs	Male mean N = 179	Standard deviation	Female mean N = 193	Standard deviation
Self-efficacy	3.922	1.089	4.036	1.398
Technology experience	4.209	1.213	4.307	1.201
Perceived ease of use	4.123	1.250	4.042	1.364
Perceived usefulness	3.920	1.162	3.922	1.299
Satisfaction	3.952	1.294	3.839	1.375
Pre-advert presence	4.088	1.011	4.181	0.980
Post-advert presence	3.927	1.166	4.032	1.107

The independent samples test was summarised in Table 4.

Table 4: Independent samples test

		Levene's test for equality of variances		T-test for equality of means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
									Lower	Upper
Self-efficacy	Equal variances assumed	.079	.778	-.876	370	.381	-.11448	.13063	-.37135	.14238
	Equal variances not assumed			-.885	359.471	.377	-.11448	.12943	-.36901	.14005

Technology experience	Equal variances assumed	.003	.957	-.789	370	.430	-.09886	.12523	-.34511	.14739
	Equal variances not assumed			-.789	367.350	.431	-.09886	.12527	-.34520	.14748
Perceived ease of use	Equal variances assumed	1.862	.173	.599	370	.549	.08145	.13596	-.18590	.34881
	Equal variances not assumed			.601	369.946	.548	.08145	.13551	-.18502	.34793
Perceived usefulness	Equal variances assumed	3.927	.048	-.018	370	.985	-.00235	.12818	-.25441	.24970
	Equal variances not assumed			-.018	369.531	.985	-.00235	.12765	-.25336	.24865
Satisfaction	Equal variances assumed	1.699	.193	.809	370	.419	.11220	.13871	-.16056	.38497
	Equal variances not assumed			.811	369.922	.418	.11220	.13839	-.15993	.38434
Pre-advert presence	Equal variances assumed	.021	.884	-.908	370	.364	-.09382	.10328	-.29691	.10926
	Equal variances not assumed			-.907	365.821	.365	-.09382	.10340	-.29716	.10951
Post-advert presence	Equal variances assumed	.022	.882	-.895	370	.372	-.10544	.11786	-.33720	.12631
	Equal variances not assumed			-.893	364.083	.373	-.10544	.11809	-.33766	.12678

The assumption of homogeneity of variances were tested and satisfied via Levene's F-test, F(370) = 0.079, p = 0.778 for self-efficacy, F(370) = 0.003, p = 0.957 for technology experience, F(370) = 1.862, p = 0.173 for perceived ease of use, F(370) = 3.927, p = 0.048 for perceived usefulness, F(370) = 1.699, p = 0.193 for satisfaction, F(370) = 0.021, p = 0.884 for pre-advertisement presence and F(370) = 0.022, p = 0.882 for post-advertisement presence.

The independent samples t-test was associated with a statistically significant effect t(370) = -0.876, p = 0.381 for self-efficacy, t(370) = -0.789, p = 0.430 for technology experience, t(370) = 0.599, p = 0.549 for perceived ease of use, t(370) = -0.018, p = 0.985 for perceived usefulness, t(370) = 0.809, p = 0.419 for satisfaction, t(370) = -0.908, p = 0.364 for pre-advertisement presence and t(370) = -0.895, p = 0.372 for post-advertisement presence.

In terms of students' self-efficacy, technology experience and satisfaction in association with the use of a VLE, students do possess self-efficacy in terms of the use of VLEs, have positive technology experience with the use of VLEs and are satisfied with the use of VLEs. Furthermore, students indicated positive associations with regard to the ease of use of a VLE and the usefulness of a VLE. In terms of students' use of a VLE without the presence of advertisements and the use of a VLE with the presence of advertisements, the findings indicate that students had positive attitudes to both projected VLE scenarios.

There was a statistically significant difference found between male and female students of the chosen South African university of technology in terms of the perceived usefulness of VLEs. Consequently, H_a3 is rejected and H_o3 is accepted. For the remainder of the constructs, there were no statistically significant differences found between the male and female students of the chosen South African university of technology. As such, females were associated with a statistically larger mean for five out of the seven constructs compared to males, namely self-efficacy, technology experience, perceived usefulness, pre-advertisement presence and post-advertisement presence. Owing to there being no statistically significant differences between males and females, there was no need to determine if the differences have any practical significant effect and as such, the Cohen's D statistic was not calculated. Consequently, the null hypothesis of H_o1, H_o2, H_o4, H_o5 H_o6 H_o7 are rejected and H_a1, H_a2, H_a4, H_a5, H_a6 and H_a7, the alternatives, are accepted.

Although the findings show that females were associated with statistically larger means for five out of the seven constructs compared to males, namely self-efficacy, technology experience, perceived usefulness, pre-advertisement presence and post-advertisement presence, there was no statistically significant difference between male and female students' attitudes towards the use of a VLE as an advertising platform at a South African university of technology.

5. CONCLUSION

For some students the use of technology is natural, which will result in limited to no resistance towards the introduction of technology innovations, such as VLEs, although caution must be taken where technology does not come naturally to students, especially in a country like South Africa where there is a high fraction of previously disadvantaged students. While students who may have used the VLE prior to the integration of advertisements may be reluctant at first, they may become more open-minded once they realise what the cost to benefit is that this

integration can bring, while students who enrol at HEIs and find these programmes already in place may also be more likely to accept VLEs with the presence of advertisements.

Although there was a statistically significant difference found between male and female students at the chosen South African university of technology in terms of the perceived usefulness of VLEs, there were no statistically significant differences found between the male and female students of the chosen South African university of technology for the remainder of the constructs. As such, females were associated with a statistically larger mean for five out of the seven constructs compared to males, namely self-efficacy, technology experience, perceived usefulness, pre-advertisement presence and post-advertisement presence.

The study recommends that students strive to develop the necessary skills to remain active and included in an increasingly digital society. Through the development of computer labs and the programme of loaning out laptops, HEIs are in a better position to ensure that students keep up with the digital world, while cultivating a generation of digital native graduates who will not only appeal to the corporate market within South Africa, but internationally as well.

Owing to the increased presence of digitalisation in the HEI sphere and the ever-increasing use of technological innovations in teaching and learning, it is imperative that HEIs stay abreast of all these developments and changes if they want to remain competitive, while challenging students' aptitudes in new and imaginative ways. As a result of the significant digital growth and transformation that is taking place, significant opportunities are beginning to present themselves to HEIs to educate and equip students through digital platforms, such as VLEs. Through research it has become evident that not only do VLEs, being web-based, provide a means for HEIs to generate long-term revenue, but they have the capacity to become open digital platforms for marketers to take advantage of. The responsibility now lies with the management of HEIs to decide if they would like to consider this route of revenue generation and see if it will indeed be as beneficial as the theory suggests.

To avoid any potential financial risks associated with the implementation of advertisements on VLEs, HEIs can apply this theory by engaging in trial run projects with a willing organisation to analyse the viability of this proposed initiative. Based on the outcomes, HEIs can then either choose to implement external advertising on the VLEs being used on a larger scale or not. With the use of these VLEs, marketers may find it easier to reach their target audiences in a more focused approach when placing advertisements on this platform, while HEIs can use the income generated to cover the cost of any technological advancements that may be required, without having to increase student fees. This will assist with funding the clarion call for free

education and, although, the financial benefit may not be as significant as that of an increase in fees, this will be a step in the right direction, which may also open the door for further innovative ideas that could enhance revenue generation for HEIs.

Based on the findings of this study, there are several limitations that must be considered. When selecting the sample, a non-probability sampling method was employed. Although various demographic questions were included in the study to enhance the representativeness of the sample and minimise the effect of convenience sampling, it is advisable that caution should be exercised when attempting to generalise the findings of this study to the wider population. In addition, this study was focused on one HEI, which only utilises one VLE, prohibiting any generalisations to be made regarding students across South Africa.

A cross-sectional design was utilised in the study, therefore the findings stated here are an overview of a select cohort of South African students' attitudes towards the use of a VLE with the presence of advertisements at one HEI, highlighting the need for caution to be exercised when attempting to generalise the findings of this study to the wider population, both in South Africa and around the world. Owing to the inevitable changes that will take place in the methods and strategies used in advertising, the findings of this study may become obsolete in a few years to come. Based on the revolutionary impact the COVID-19 pandemic has had on teaching and learning at present and in the future, there is an opportunity for further research to be conducted in terms of the impact COVID-19 is deemed to have on higher education, HEIs and the use of VLEs. Although the response rate was deemed respectable for this study, it is relatively small when compared to the size of the South African HEI environment, hence caution should be taken when generalising the findings of this research study.

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