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MEDIA USAGE PATTERNS OF AFRICAN HIGHER EDUCATION STUDENTS: A GHANAIAN PERSPECTIVE

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Abstract

The study examined the media usage patterns of 598 university students in Ghana to understand their demands for digital teaching and learning, as well as their patterns of media use for learning, with the goal of informing the media selection process. Overall, the study found that the universities fell short of meeting students' expressed need for digital learning formats. The gap represents both a challenge and an opportunity for the expansion of digital teaching and learning formats in Ghanaian universities. Furthermore, the media usage patterns reveal significant leisure-seeking and recreational uses of media by students, emphasizing the pervasiveness and embeddedness of smartphones in academic contexts. The emphasis on entertainment usage and the prevalent use of media for hedonistic purposes may suggest a deficit in digital skills regarding the use of media for learning. The study found no significant differences in user profiles between traditional and non-traditional students. The implications for instructional design activities and strategies for a mobile-saturated context are discussed.

Keywords:

Media Usage Patterns, Digital Media, Higher Education, Digital Education

Introduction

The use of digital technologies in the teaching and learning processes within higher education has become commonplace all over the world. Ross et al. (2010) acknowledged three key roles of technology in education, namely: (i) technology as a tutor, (ii) technology as a teaching aid, and (iii) technology as a learning tool. They contend that understanding these clear roles helps to explain implementation differences across educational contexts. Technology is increasingly influencing not only what is taught, but also how it is taught (Daniel, 2015; Watters, 2014). Therefore, to fully benefit from digital education, the digital learning environment must be thoughtfully designed. This includes an examination of the teaching and learning environment, as well as learner characteristics, to gain a better understanding of their needs, experiences, and motivation, as well as to inform the media selection process. Thus, understanding students' media usage behaviour aids in determining the most effective media to use in a given instructional situation (Bates, 2015; Morrison et al., 2011).

Brandzaeg (2010) defines a user typology as "the categorisation of users into distinct user types that describes the various ways in which individuals use different media, reflecting a varying amount of activity/content preferences, frequency of use and variety of use" (pg. 941). He argued that typologies allow for the classification of media users based on their actual usage patterns rather than on demographic or contextual factors. While there is pervasive use of digital media by higher education students, there is little evidence about their pattern of use for learning. In the meta-analysis of 22 studies on media usage typologies conducted by Brandtzaeg (2010), only Johnson and Kulpa (2007) focused on higher education students. Since then, there have been a number of studies on media usage typologies conducted in various country contexts, notably Germany (Dolch et al., 2021; Dolch & Zawacki-Richter, 2018; Zawacki-Richter et al., 2015), Spain (Gonzalez et al., 2019), and Turkey (Özlu & Kalyoncuoglu, 2017).

Despite the valuable contribution these studies have made to our understanding of higher education students' media usage patterns, they have primarily been conducted in contexts that are digitally advanced, as defined by advancements in learning technologies, high internet connectivity and speed, early adoption of technologies, and high skill levels in the use of digital media (Gierdowski et al., 2020; Higher Education Academy, 2014; Zawacki-Richter, 2020). For example, in a JISC Report that surveyed 20,575 students across 28 universities in

the United Kingdom, only 3% rated their institution's digital provision as poor, while 77% gave a positive rating of the quality of digital teaching and learning on their courses (Killen & Langer-Crame, 2020). In comparison, developing-countries are confronted with challenges of inconsistent power supply, low technology infrastructure, lower internet penetration, and low digital skills (Agba, 2020; Gama et al., 2022; Guri-Rosenblit, 2014; Pete & Soko, 2020).

Given that structural and sociocultural factors influence how people use media (Barnes et al., 2007; Balakrishnan et al., 2016; Dutton & Blank, 2015), media users cannot be viewed as a globally homogeneous group. Culture plays an important role in online learning and should therefore be considered during the instructional design process (Bhagat & Chang, 2018; Milheim, 2014; Nguyen, 2015), especially in resource-constrained settings that face enormous technological challenges. The apparent digital divide warrants additional research in order to arrive at a nuanced description of the media usage characteristics of students in a developing country context, which appear to have been overlooked in the literature regarding media-user typologies. Consequently, this study seeks to generate a clearer understanding of the media usage behaviour of students in the Ghanaian higher education context. More specifically, the study addresses the following research questions:

1. What kind of digital devices do the students in Ghana's higher education have access to?
2. What is the difference between the supply and demand of digital teaching and learning practices that higher education institutions in Ghana offer?
3. What kinds of different media usage types can be identified among higher education students in Ghana?

Methodology

Sample and Instrument

This study deployed an online survey, which was conducted between April and October 2020. The questionnaire was distributed via an e-mail list of contact persons within the participating higher education institutions (HEIs). Participation was voluntary and self-recruited. In total, 598 students from 26 Ghanaian HEIs, comprising 16 public universities and 10 private universities, participated in the study. Participants had a mean age of 25 years ($SD = 5.72$), with a range of 18 to 49 years, and had studied for an average of four semesters ($SD = 2.23$) at the university. Majority were Business Sciences and Economics students (30.83%), followed by students in the STEM subject areas (27.67%). Table 1 shows the distribution of study subjects.

Table 1: Study subjects of survey participants

Rank	Study Area	n	Valid %
1	Business Sciences & Economics	78	30.8
2	Science, Technology, Engineering, and Mathematics (STEM)	70	27.7
3	Arts & Humanities	37	14.6
4	Education & Social Sciences	35	13.8
5	Medical & Health Sciences	20	7.9
6	Natural and Agricultural Sciences	13	5.2
Valid Total		253	100

The study utilized a questionnaire adapted from previous studies (Zawacki-Richter et al., 2015; Dolch and Zawacki-Richter, 2018). Participants were asked to rate the importance of 10 digital teaching and learning formats (5 = very important to 1 = not important at all), as well as their frequency of use of these formats (5 = very often to 1 = not at all) at their respective universities. The answers "I'm not familiar with that" or "I don't know" were defined as missing values. Additionally, Zawacki-Richter et al.'s (2015) computation of the supply

and demand of digital teaching and learning formats was adopted to index the difference between the mean values of students demand and the current provisions supplied by the institutions (i.e., $\Delta MV = MV_{\text{Demand}} - MV_{\text{Supply}}$; see also Dolch et al., 2021; Dolch & Zawacki-Richter, 2018).

Results and discussions

Access to digital media and internet

Table 2 shows extensive access to digital devices by students, particularly Smartphones (96.2%) and Notebooks/Laptops (85.3%). Netbooks and MP-3 players recorded low access rates of 23.1% and 33.1%, respectively. Furthermore, access to mobile internet connections (71.9 %) was much higher than fixed broadband internet connections (32.5). Participants reported spending an average of 7 hours a day on the internet. This confirms a high degree of preference for mobility, which permits location-independent study.

Table 2: Access rate of digital devices

Device	Access Rate (%)
Smartphone with internet access	96.2
Notebook/Laptop	85.3
Mobile Internet	71.9
Desktop-PC	61
Cellphone without internet access	59.1
Tablet-PC	49.8
Printer	49.3
Scanner	42.2
Wearable devices	40.4
E-Book-Reader	39.1
MP3-Player	33.1
Internet @ home (Fixed Broadband)	32.5
Netbook	23.1

Demand and supply of digital teaching and learning formats

Students were required to indicate the availability of use (supply), and the importance they placed on the use (demand) of ten digital teaching and learning formats in their universities. The availability indicates the current provision made by the university while the importance signals a need for the use of such formats. The difference between the supply and demand of digital teaching and learning practices provides an indication for expandability prospects for digital teaching and the learning formats. From Table 3, the difference in mean values (ΔMV) suggest that audience response systems and lectures via podcasts/vodcasts jointly have the highest disparity between supply and demand ($\Delta MV = 0.74$). This means that while the students consider these tools as very important for their studies, their availability for use is relatively low. The low difference between the desired and actual values for course material in the university's learning management system and the deployment of online assessments suggest that student needs for these media are being met to a large extent.

Table 3: Demand and supply of digital teaching and learning formats

Digital Teaching and Learning Format	Desired			Actual			ΔMV
	N	MV	SD	N	MV	SD	
Audience Response Systems	239	3.68	1.163	250	2.94	1.355	0.74
Lectures via podcast/vodcast	238	3.3	1.118	255	2.56	1.358	0.74

Virtual practical courses and labs	241	3.34	1.177	254	2.62	1.351	0.72
Virtual seminars and tutorials with tele-cooperation	245	3.4	1.168	256	2.69	1.294	0.71
Interactive multimedia-based study materials	254	3.5	1.117	260	2.92	1.265	0.58
E-portfolios	227	3.16	1.11	234	2.59	1.209	0.57
Collaborative online tools	252	3.27	1.223	263	2.83	1.318	0.44
Web-based trainings / study course on the intranet or internet	250	3.29	1.191	263	2.87	1.323	0.42
Material accompanying courses in LMS	260	3.55	1.119	270	3.15	1.256	0.40
Online tests and assessments	257	3.38	1.146	264	2.98	1.348	0.40

Table 4: Differences in the demand for digital teaching and learning formats between traditional students (TS) and non traditional students (NTS).

Digital Teaching and Learning Format	Student type	N	M	SD	T	df	p(2- tailed)
Audience Response Systems	TS	131	3.53	1.21	-2.801	221	.006*
	NTS	92	3.97	1.08			
Material accompanying the courses LMS	TS	142	3.5	1.16	-0.659	239	.510
	NTS	99	3.6	1.04			
Interactive multimedia-based study materials	TS	136	3.54	1.15	1.000	233	.319
	NTS	99	3.39	1.12			
Virtual seminars and tutorials with tele-cooperation	TS	135	3.45	1.20	0.835	227	.405
	NTS	94	3.32	1.16			
Lectures via podcasts/vodcast	TS	128	3.38	1.08	1.181	219	.239
	NTS	93	3.19	1.19			
Virtual practical courses and labs	TS	132	3.42	1.17	1.072	221	.285
	NTS	91	3.24	1.24			
Online tests and assessments / E-Assessment	TS	139	3.45	1.15	1.127	233	.261
	NTS	96	3.28	1.15			
Web-based trainings / study course on the intranet or internet	TS	138	3.3	1.20	0.287	229	.774
	NTS	93	3.26	1.21			
E-portfolios	TS	125	3.11	1.12	-0.922	209	.357
	NTS	86	3.26	1.10			
Collaborative online tools	TS	139	3.25	1.25	0.061	228	.951
	NTS	91	3.24	1.16			

An independent t-test was run to determine any possible differences between traditional students and non-traditional students in terms of their demand for each of the 10 digital teaching and learning formats as shown in Table 4. Only audience response systems showed a significant difference between the two student types. The fact that non-traditional students had a higher demand for the use audience response system may not entirely be surprising given the media's inherent ability to promote high classroom engagement.

Use of mobile phones for academic purposes

Students were asked to rate how frequently (1=not at all - 5=very often) they utilized their mobile phones for various university-related academic tasks. Results show it was mainly for sending instant messaging/chats to other students. Additional noteworthy uses of smartphones include information-seeking on the internet outside

classes, research for assignments, and browsing social networks. The top 10 activities students frequently undertook with smartphones in the university are shown in Figure 1.

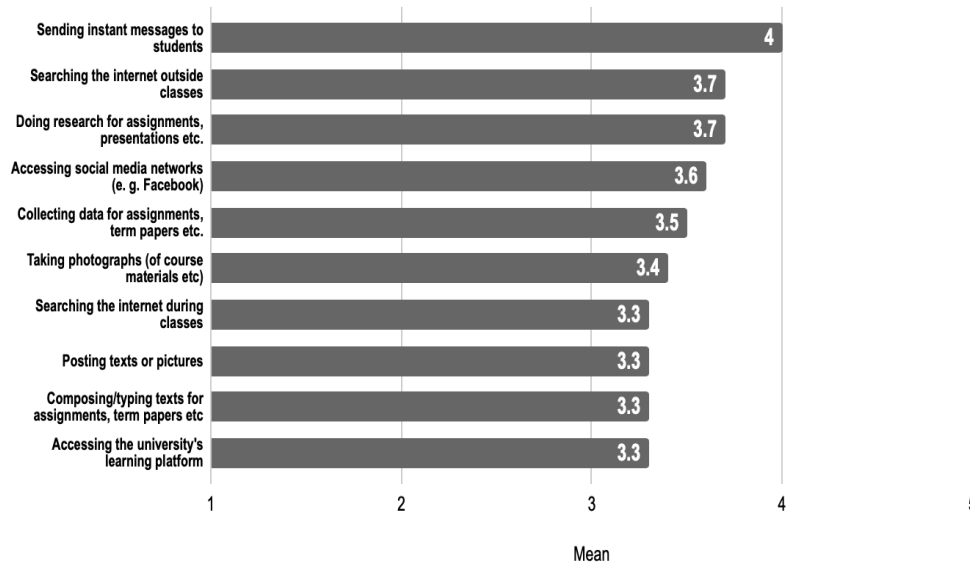


Figure 1. The use of smartphones by university students

Media usage profiles types identified among higher education students in Ghana

In a longitudinal study of German higher education students, Zawacki-Richter et al. (2015) established a typology of media users with four profiles, namely: *entertainment users*, *peripheral users*, *advanced users*, and *instrumental users*. This study adopted the same scales used for the latent class analysis (LCA) in the Zawacki-Richter et al. (2015) study to identify user types among Ghanaian higher education students. The percentages of identified profiles are shown in Figure 2. More than half (53.1%) of the students were identified as entertainment users, defined by a high propensity for intense use of the internet for leisure activities including being active on social networks. Advanced users constituted 40.4% of the students whose profile include the characteristics of entertainment users but, in addition, possess a high preference and use of e-learning, productivity and creativity tools for learning. Peripheral users formed 5.7% of the sample and were defined by the tendency for low acceptance of all media tools and services. Lastly, instrumental users accounted for only 0.8% of the sample and were defined as users likely to accept and use productivity tools including office software but rarely use media for leisure and recreational activities. They tend to use media for only specific activities when needed. No significant differences were observed between the user profiles of traditional students versus non-traditional students ($\chi^2 = 4.8$, $df = 4$, $p > .05$; Cramer's $V = .45$).

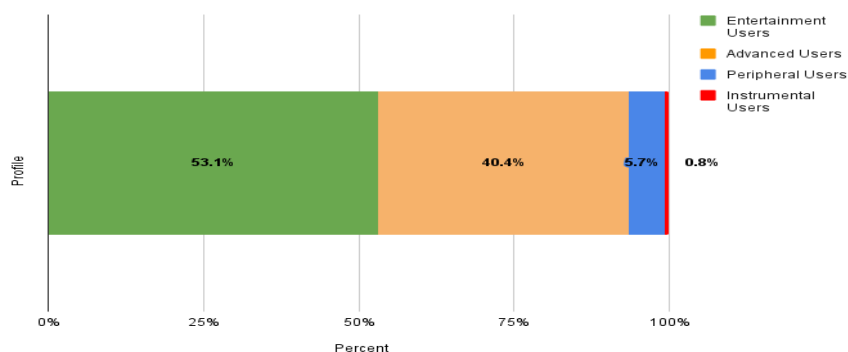


Figure 2. Distribution of media usage types of higher education students in Ghana

Conclusion and Further Perspectives

The study highlights how mobile devices are embedded in the academic activities of students in Ghanaian universities, underscoring a preference for mobility which promotes location-independent studies. Students used smartphones mainly to achieve communication and information searching tasks, which confirms the highly transmissive nature of learning in digital environments in African higher education (Loglo & Zawacki-Richter, 2023). The high access rate and use of smartphones among students represents an opportunity for the implementation of mobile learning strategies, which have been a subject of interest in recent studies (Adzifome & Agyei, 2023; Edumadze et al., 2019). However, given that the pedagogical opportunities for mobile technologies are still under-exploited in developing countries (Kaliisa et al., 2019), the necessary capacity and professional development efforts for teachers and instructional designers in the design of appropriate instructional materials, and to the support for students to use mobile technologies must be intensified.

The study demonstrates a clear demand for the use of digital teaching and learning formats, with no significant differences generally observed between traditional and non-traditional students. While fixed broadband internet connectivity offers educational advantages such as higher speed and consistent performance compared to mobile internet connections, the poor internet infrastructure in Ghana makes mobile internet connections the most viable option for digital learning. Grothaus et al.'s (2021) study of media usage in a Thai university mirrors this same phenomenon in Ghana. Therefore, it is highly recommended that the government seizes the opportunity to provide incentive schemes for mobile network operators, encouraging investments and partnerships with institutions of higher learning, similar to successful examples in Kenya¹ and South Africa².

The media usage types identified reveal high leisure-seeking and recreational usage of media among higher education students in Ghana. The substantial numbers of entertainment users compared to advanced users perhaps suggest that a deficit in digital skills of Ghanaian students could contribute to the use of media for hedonistic purposes within learning contexts. Similar findings were made regarding the typology of users in the German higher education (Dolch et al., 2021) who may necessarily not have the same digital skills deficiencies. However, the identified typologies provide pointers for instructional designers and teachers in utilizing social networks, videos, and messaging applications to achieve educational outcomes in a digitally challenging context. The long term goal is to optimize the use of context-appropriate technologies, and ultimately cause a shift towards increased numbers within the advanced user group.

In conclusion, this study only lays the foundation for understanding the characteristics of the learner and context which informs the media selection stage in the instructional design process. Further studies are required to compare data from a developed country and developing country perspective regarding media usage of students to identify key patterns. Additionally, it would be useful to assess the digital education efforts in Ghana from a macro, meso, and micro perspective (Zawacki-Richter et al., 2009) to derive a comprehensive understanding of

¹ <https://news.mku.ac.ke/mku-partners-with-telkom-kenya-to-boost-odel-programmes/>

² <https://www.universityworldnews.com/post.php?story=20200408201225155>

the digital transformation efforts within the context. Beyond that, the need for major investments in the technical and technological infrastructure cannot be overemphasized.

Note: This Conference paper presents only the preliminary results of a doctoral project.

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