

Complementing Classroom Learning Experience by Leveraging Educational Apps: A Study of Selected Undergraduates in Ghana

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ABSTRACT

Using technology in education has lately become a necessary complement if not a replacement for traditional learning. Learners tend to support, enhance, and personalize their learning experiences with educational technologies. Some tertiary institutions officially provide educational apps to all students. Meanwhile, in the absence of such provisions, these technologies may be adopted by students. In any case, it is relevant to ascertain whether undergraduates leverage educational apps to complement their learning experiences and also, find out the types of apps they rely on to augment their traditional style of learning. Hence, using cluster and simple random sampling techniques, this study sampled 800 undergraduate respondents from four public universities in Ghana with a population of about 82,825 undergraduates. A questionnaire made up of both open-ended and close-ended questions was used to collect data. Descriptive statistics based on frequencies and percentages, and content analysis were used in the analysis and interpretation. The study reveals that majority of students partially depend on educational apps, while a significant minority depends fully on these apps. Consequently, some discussions that may encourage and motivate undergraduates to complement traditional learning with educational software which can result in a better learning experience are revealed.

Keywords

Educational apps, educational technology, tertiary institution, traditional learning, learning experiences.

1. INTRODUCTION

The current behavior and lifestyles of humans have been altered and transformed by modern technology [1]. Activities of and processes in education have also seen constant alterations [2].

This, in turn, throws new challenges to learners to change or complement their old ways of seeking knowledge with Educational Technologies (EdTech), thus, if only they want to catch-up with the technological era of everything. Technology has produced lots of electronic gadgets with millions of software applications (apps) running on them. These apps help users to perform certain tasks, therefore users in the education category are not left behind. Therefore, students are exposed to different alternative software to perform whatever learning tasks they wish to complete. These technological innovations in learning and teaching have proven that satisfactory results can be attained even outside the traditional classroom setting [3]. In this contemporary and post-covid era, the demand for knowledge has increased and this has exposed diverse ways of learning. Educational apps provide learners with options that help them to improve access to

knowledge, personalize their learning experiences, collaborate on tasks, and pass on knowledge to others.

Consequently, this study seeks:

- To ascertain whether undergraduates use educational apps to complement traditional learning.
- To identify the various kinds of apps that undergraduates leverage in their learning processes.

2. RELATED LITERATURE

The effectiveness, personalization, and experience of integrating EdTech do not only lie in the hardware but also in the software that powers the physical parts [4]. Though these educational apps are still in early stages of integration [5], they may be available for free or paid, customizable or non-customizable, proprietary or open-source, but whatever be the case, they extend the reach of access to information and augment the customary style of learning and teaching. The lockdowns that came with COVID-19 outbreak posed challenges to higher education and schools to respond in a manner to sustain if not to improve the existing pedagogical quality [6].

2.1 Modern trends in the usage of educational applications

Studies have shown that most of the educational uses of software applications are realized in searches, performing customized tasks, and communication [7]. This is seen in their applications in augmented and virtual realities, audio-visuals, digitizing and digitalization, artificial intelligence, simulations, computer-based teaching, and assessment aids, etc. According to [8], China experts online learning to transform and positively affect learning and teaching processes to become more student-centered and interactive. Notwithstanding, there are potential issues such as safety and security issues, reliability, privacy, misuse, and interferences [9] that ought to be given attention.

2.2 Traditional classroom setting

The setting of the orthodox classroom learning was not initially designed to utilize the student-centered method of delivery [10], and motivate a personalized way of learning [11]. It rather focused more on the instructor than the learner [12]. Meanwhile, according to [13], technology can help improve the situation by shifting or balancing the focus from trainers to trainees.

3. METHODOLOGY

The study uses a pragmatic approach as its philosophy. In that way, the researcher is allowed to use any appropriate method of inquiry that deems fit at every stage [14], [15]. Cluster

sampling technique was used to select the participating universities. A simple random sampling method was adopted and supported by [16] formula for the calculation of the required size. The sample units (800 students spread across various departments) from the study population (82,825 undergraduates) came from the four selected universities (University of Cape Coast, University of Ghana, Kwame Nkrumah University of Science and Technology, and Cape Coast Technical University). A mixed-method of both qualitative and quantitative techniques is used to design the questionnaire (offline and online versions) which is made up of open and close-ended questions [17]. The open-ended question allowed the respondents to mention their subjective responses to be used in the summative content analysis while the close-ended questions allowed the researchers to inquire in a much more controlled way [18].

4. FINDINGS

A questionnaire that is made up of four major questions is used to collect data from the sample.

Question 1- The first question which is a close-ended question has three options (Fully, Partially, and Never) as choices for respondents to select one. Students who selected “Fully or Partially” were made to answer follow up questions (2 to 4).

Table 1. Have you depended on any educational software to improve your understanding of a particular subject/course?

Choice	Frequency	Percentage
Fully	304	38.0%
Partially	485	60.6%
Never	11	1.4%
Total	800	100.0%

As shown in Table 1, 304 (38%) out of 800 students fully use computer/mobile applications to improve their understanding of the courses or topics they are taught in class while 485 (60.6%) out of the total, partially support their learning with apps. Meanwhile, 11 students (1.4%) said they never depended on any app to improve their knowledge of a particular subject. The study does not further ask about why they never use apps in learning.

Question 2- The second question is concerned with how students who use apps in supporting learning get introduced to the same. They are therefore asked a closed-ended question with three choices of answers (Internet, Teacher/Institution, Another person).

Table 2. How were you introduced to the educational software?

Choice	Frequency	Percentage
Not Applicable	11	1.4%
Internet	365	45.6%
Another person	225	28.1%
Teacher/Institution	199	24.9%
Total	800	100%

In Table 2, 11 students (1.4%) out of the 800 respondents, selected “Never” (Table 1) hence Question 2 is not applicable to them. Alternatively, 365 (45.6%) students got to know the educational software through their usual surfing on the internet. 225 students (28.1%) were introduced to the educational apps through people other than their teachers' while 199 (24.9%) from the 800 students, were exposed to the apps by their teachers.

Question 3- Respondents are asked to mention the educational apps they use to support learning. This inquiry is made in an open-ended manner to allow the sampled students to mention their subjective educational apps without limitations so as to find out the types of software they use to complement their unique learning experiences.

Fig. 1 as shown below, represents the various apps some respondents mentioned. Some students mentioned more than one software; therefore, the number of responses (mentioned apps) may not necessarily match the sample size (800) used for this current study. The various computer applications that the sampled students use to complement learning are either run on mobile devices, PCs, or both, and may be institutional or individual recommended apps. Each of the responses were manually perused, and similar apps/software were grouped. For example, Google’s suite of apps claimed majority (35%) of all the responses as shown by Fig. 1.

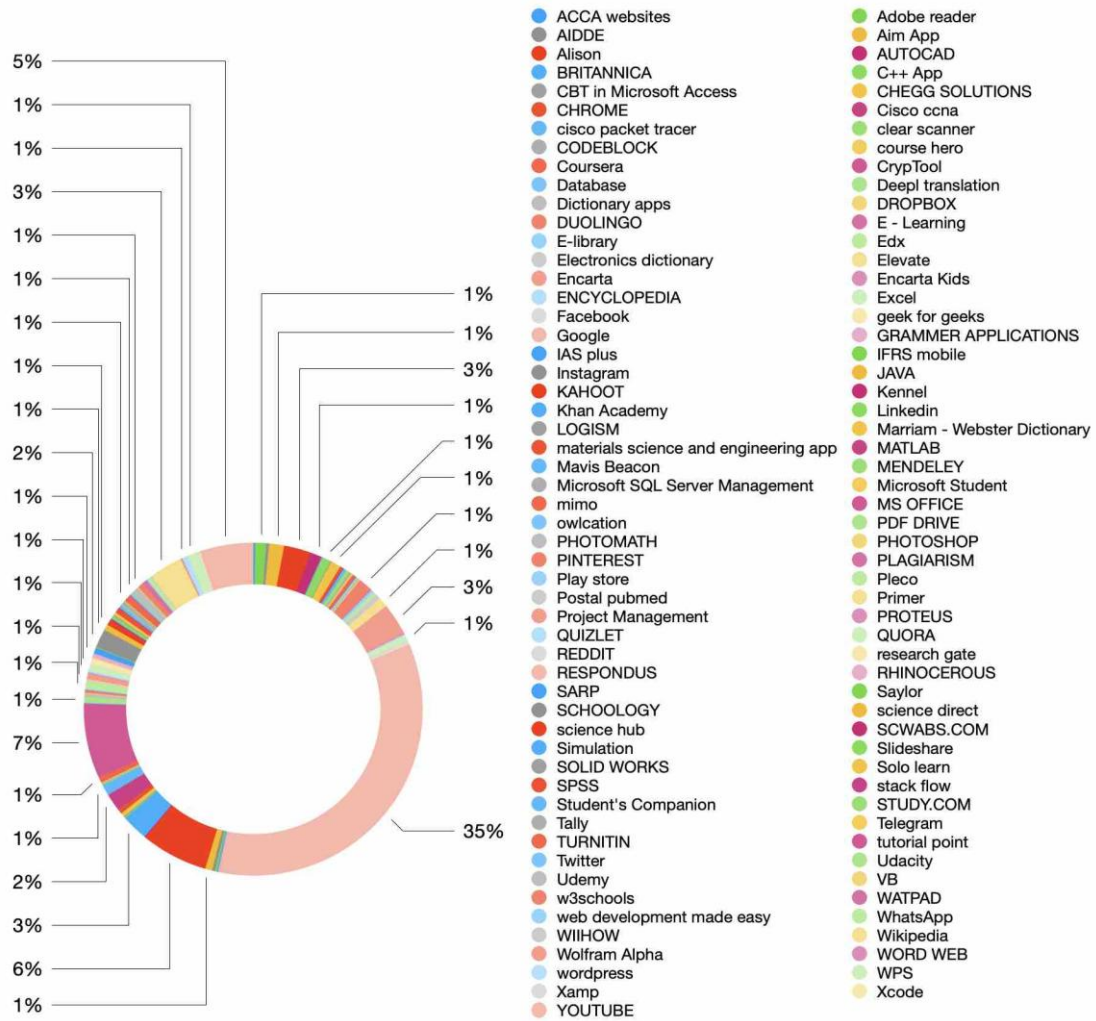


Fig 1:Pie Chart of all the various apps mentioned by students

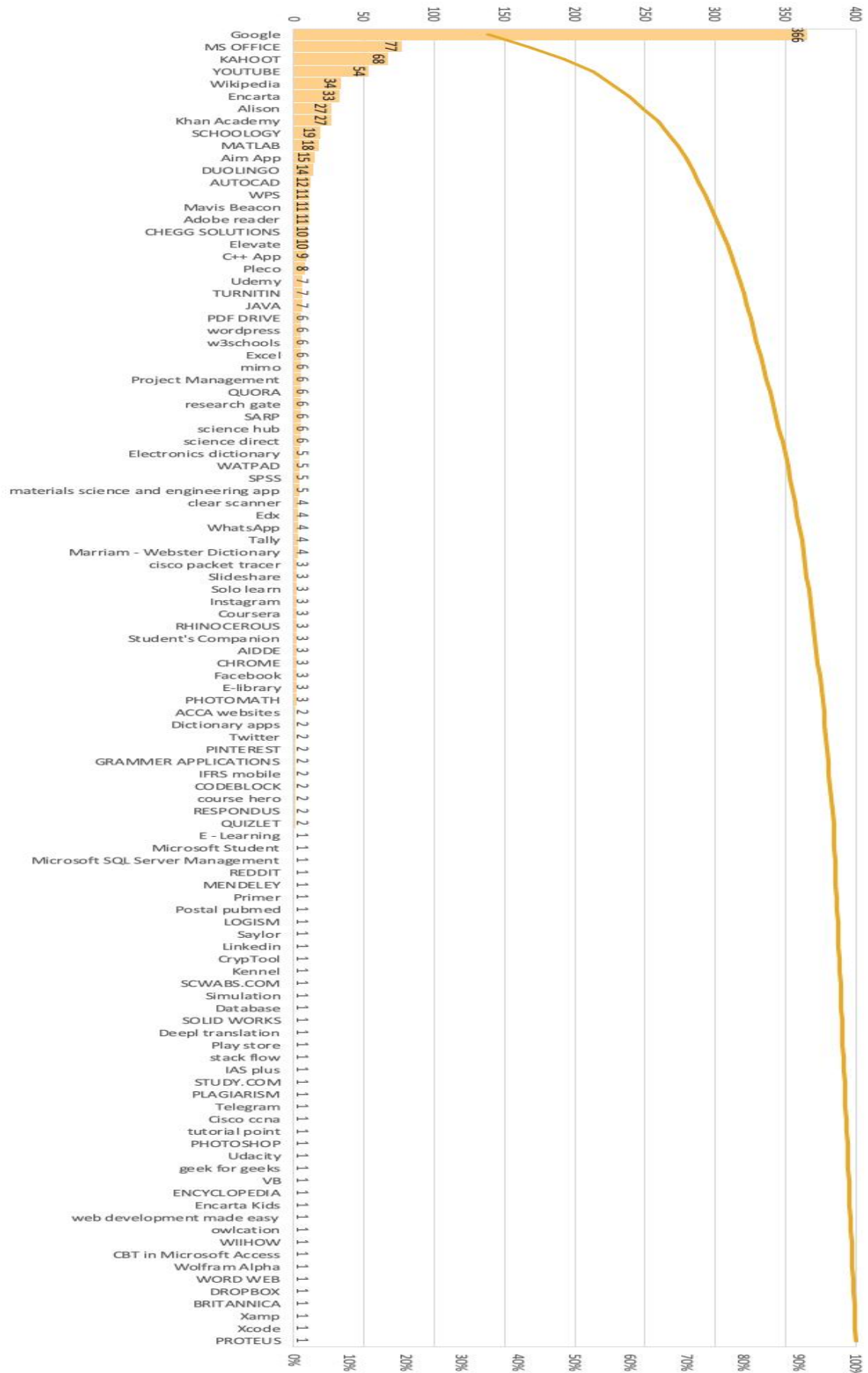


Fig 2: Bar Chart representing the frequencies for the apps

Below are relative groupings for the various apps shown in Fig. 2:

- Google products- Google search, scholar, classroom, translator, Google for education, calendar, G Suite, and YouTube.
- Microsoft products- Word, PowerPoint, Excel, Access, Publisher, Visio, Encarta, Windows Server, and Microsoft student.
- Online learning Platforms- Kahoot, Alison, Chegg, Khan Academy, W3Schools, TutorialsPoint, Quora, edX, GeeksforGeeks, Owl cation, Getmimo, Quizlet, SlideShare, Saylor Academy, Sololearn, Stack Overflow, Study.com, Udacity, Udemy, Wattpad, and Course hero.
- Language and Voice- Deepl, and Duolingo
- Social media- Facebook, WhatsApp, Instagram, LinkedIn, Pinterest, Reddit, and Telegram
- Course related Websites & Mobile apps- IAS Plus, ACCA, Material Science & engineering app, Logisim, Schwab, Tally, PhotoMath, Photoshop, and Cryptool.
- General Apps- Elevate App, Student companion app, Wolfram Alpha, WPS Office, Mavis Beacon, PDF Drive, Dropbox.
- Library and reference, plagiarism and research- Mendeley, ScienceDirect, Sci-hub, ResearchGate, SPSS, and Turnitin.
- Dictionary apps- Merriam webster, Pleco, and Wordweb
- Modelling and Simulation Programmes- Proteus, Rhinoceros, and SolidWorks
- Assessment- Respondus.
- Blogs- Wikihow, and Wikipedia

Question 4- As a follow up to Question 3, Question 4 aims at knowing the extent to which respondents will recommend to other students the usage of educational apps to support classroom learning.

Table 3. Will you recommend students' usage of computer/mobile applications for learning?

Choice	Frequency
Not Applicable	11
Fully	509
Partially	280
Total	800

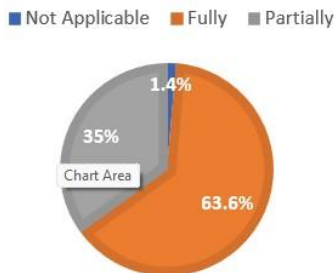


Fig. 3: Pie chart representing the percentage distribution for Table 3

Table 3 and Fig. 4 represent the responses from students when

they were asked whether they would recommend or suggest to their colleagues to support their classroom learning activities with educational apps. It is shown that 509 students (63.6%) recommend that their colleagues should fully leverage educational computer programs to boost their knowledge and comprehension of lessons or topics treated in class. On the other hand, 280 respondents (35%) recommend a partial dependence on apps to their colleagues concerning topics or lessons within the courses they study. “Not Applicable” refers to the group of respondents who have never used apps as found in “Question 1”, hence, their disqualification from “Question 4”.

5. DISCUSSIONS

This study aimed to find out whether undergraduates support learning with educational applications and consequently know the types of apps they use to improve their learning experience. At the end of the study, it is realized that a significant majority of the sampled 800 undergraduates (89%) use educational software. Out of the majority (98.6%) of respondents, 60.6% partially depends on these apps while 38.0% does the same fully. These findings support claims made by other researchers (eg. [19]) in different domains that students complement the traditional ways of learning with educational technologies. Nonetheless, it is essential to engage in further studies to ascertain the impact of this integration on their learning outcomes, knowledge and skill acquisition, and subject assessments.

Based on the findings from Question 2, it is settled that a majority (45.6%) of the respondents through their research or surfing on the internet, get to know these existing educational software tools. Meanwhile, these apps were made known to 24.9% of the 800 sampled students through their institutions'/teachers' recommendations, and 28.1% of respondents through other persons'. This means that students have the willingness to personalize their educational experience with the support of EdTech [20]. And trainers, as well, encourage their trainees to complement their traditional learning styles with educational apps [21]. Preferably, it will do better if educational institutions or faculty members officially recommend to students some specific educational apps/software relative to their courses at the beginning of each semester. It is realized in this study that majority of students carelessly, tend to surfing the internet in the quest to finding appropriate learning aids on their own.

Respondents' feedback on Question 3 confirms that though there exist lots of educational apps/platforms online, students mostly use Google's services when they want to support traditional learning with technology. Additionally, they recommend blending education with technology to their colleagues. Perhaps students could save some effort and be more productive if they had a list of reviewed alternative software made available by the institution.

6. CONCLUSION

In their research, [20] and [21], it is learned that there exists an interest of students to contextualize their relative learning approaches. This current study confirms that students are willing, and do complement their subjective ways of learning with existing educational computer/mobile software applications. It further reveals that institutions and lecturers do recommend and expose their learners to EdTech. Hence, it is important to customize, regulate, monitor, and track the usage of these apps and platforms to ensure a successful integration [22].

6.1 Future scope

This study provides a background for subsequent studies that are aimed at addressing the challenges and impact of integrating educational apps into the traditional way of learning in higher education in Ghana.

7. RECOMMENDATIONS

Below are suggestions from the findings of this research: Considering the imbalanced students to lecturer ratio in most of Ghana's public universities [23], it is appropriate for educational institutions and faculties to recommend educational apps to students to help them personalize their learning experience. Students must often complement the traditional ways of learning with educational technologies to improve their knowledge gained through the traditional classroom setting.

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