

Title: Empowering Education: Unleashing the Potential of Digital Mobile-Based Learning a Qualitative survey

Abstract:

Our endeavor is to make English textbook learning more effective and efficient utilizing technology by incorporating it into a mobile app. Improve English synthesis or acquisition skills by making the app a helpful resource for rural instructors and students from a curriculum viewpoint. In this study, a qualitative research is undertaken to evaluate the effectiveness and influence of mobile-based digital learning on Bangladesh's high school for higher secondary English education. This article presents the key findings and insights from the survey, shedding light on the prospective of digital mobile-based learning in schools for higher secondary English subject. The purpose of this survey was to explore the benefits, challenges, and future potential of integrating mobile devices into the learning process. In the survey questions, it was indicated whether the students, teachers/instructors, and government organizations would find it acceptable and appreciated if textbook information were made available through a mobile app and presented in interactive format. To demonstrate the mobile app idea during the interrogation survey session a prototype is also prepared. Participants were asked for suggestions on how to make the app better and about any shortcomings. After collecting feedback, word clouds were used to analyze the frequency of the participants' recommended terms, and the LIWC approach was used to estimate overall sentiment. Presumably It provides an insight of teacher's emotion about inclusion of mobile technology in higher secondary English education system. The survey's findings show that teachers are eager to use new technology in teaching and learning, and there are tremendous opportunities adoption of mobile based digital technology in the context of learning English in Bangladesh.

Introduction

In an ever-evolving digital landscape, educational institutions are embracing the power of technology to enhance learning experiences. Mobile technology enables ubiquitous access to educational content, and both students and course instructors can maintain learning materials, assignments and other commitments in organized and easily deliverable manner. Digital mobile-based learning tools offered real-time feedback on students' progress, enabling prompt identification of learning gaps and individualized support. This data-driven approach enhanced the efficacy of formal assessments and ultimately contributed to improved academic outcomes. Digital mobile-based learning facilitated a seamless connection between classroom concepts and real-world applications. By leveraging mobile technologies, teachers could integrate current events and practical examples into lessons, making learning more relevant and relatable to students [20]–[22]. Regular updates, assignment notifications, and progress reports allowed parents to actively participate in their child's learning journey, fostering a stronger teacher-parent-student partnership.

In Bangladesh there is lacking in effective acquisition, synthesis of English language. Lots of students especially students from rural areas fail in English in the national board examinations (such as: PSC, SSC, HSC) [1]–[4]. Our anticipation is rural students are not getting proper education, lacking of learning resources like coaching, private tuition etc and quality of education is low. With recent developments in mobile technology in the field of English language learning [5]–[8] resource scarcity problems can be overcome by adoption of mobile technology. As mobile technologies have become more advanced in functions and affordable, researchers realized and suggested that using mobile apps to assist language learning would be effective [9]–[13]. The purpose of this study was to determine whether students in higher secondary schools could learn English more easily by utilizing mobile apps. Are the instructors prepared to accept technology in the classroom and do they believe it is inevitable? Will teachers accept technological advancements and app-based learning in the classroom?

Motivation and Need:

English Language learning via mobile app has become a popular medium worldwide. Based on the idea of ubiquitous learning, mobile app based English learning now provides a myriad of opportunities to support learning both inside and outside the classroom”. Despite barriers such as cost, technical considerations, accessibility, and attitudinal factors the available evidence seems to suggest that mobile learning is globally on the rise. Mobile based learning certainly increase teachers/students productivity, quality and employ-ability. In this research study a customized app is proposed. There is massive commercial potentiality of mobile based learning app

a) It will enhance English language skills, improve acquisition and synthesis ability in large scale.

b) Information dissemination among the users would be remarkably easy, can be used as a medium to contact with millions of users.

c) It can serve millions of students, provide solutions, monitor their progress, observe their difficulty levels and performance.

we anticipate that student will accept this type of technology for learning their textbook We are expecting teachers and students will be motivated, encouraged and enthusiastic to use the application. To observe the potentiality and acceptance of similar approach we conducted a survey with some teachers targeting teachers would be main user who will be using it during teaching in the classroom.

Literature Review

Mobile assisted language learning first appeared around 2005, when some USA universities began to give their students free mobile devices [14] for learning class lesson. It has been implemented in Turkey, Kuwait, Iran and neighbor country India positive attitude is found from the students [27], [28]. It came to appear more globally around 2009, when the British Council developed mobile applications (apps) for language learning. Major English language teaching (ELT) publishers producing standalone or coursebook-related apps accelerated the development and spread of this technology globally [15]. In [16] Yu, et.al (2023) designed a study to examine

the mobile technology and effect of this technology in language learning, and they found that “students enjoyed to learn new words with the help of their mobile phone, motivation was significantly stronger compared to traditional English language learning; moreover, learning outcomes were significantly better than traditional English language learning.” In order to test the effectiveness of mobile games based English vocabulary test is conducted [17]. For reading comprehension, researchers designed content aware learning environments on mobile platforms. The results of these study showed students preferred the mobile learning approach way more than the conventional approach. From various literature review it is revealed, mobile language learning can be very beneficial if it is managed in a systematic way considering the context.

Existing Apps. Strengths and weaknesses

Mobile apps have revealed vividly that it can be used as a teaching learning assistive tool. Numerous English learning apps are available in Google play store and iOS store. There are many renowned publishers worldwide have their own app for English Language such as: Cambridge, Macmillan, Oxford University Press, Barrons, McGraw-Hill, Kaplan Publishing and many more. Apart from them based on user download and google rating some popular apps in Google play store are Duolingo, Busuu, Babel, Voxy etc [25]. Some Popular Apps:

Duolingo [26] Uses games for learning language. New words are taught based on a topic and skill points are awarded for completing lessons. Exercises are tailored to help the users learn and review vocabulary effectively. Another app Babbel Focuses more on helping English language learners to acquire the basic conversational skills. Babbel has a strong focus on vocabulary. The app has different approaches: Sound/Picture Recognition, Spelling and Fill in the blanks. It uses a custom goal system that allows users to set benchmarks and can monitor their progress. Voxy features news and stories on a variety of topics, Provides games for language practice, plus short quizzes to test comprehension. Mywordbook 2 Developed by the British Council in conjunction with Cambridge University Press Offers a wonderful, engaging way to learn new words through sets of interactive flashcards. Memrise Uses creative and easy way to remember words for learning English. It creates an association between the translation and words users are already familiar with.

Across all applications, 55% have activities for vocabulary learning and vocabulary applications are about 41% [18], [19]. The most frequently employed approaches are task-based (mostly cognitive problem-solving tasks). A few applications provide list of quizzes, tests, and game for enhancing learners’ comprehension and self-checks [17]. In terms of target learners’ profile age, interest, and proficiency level, difficulty level varies. Most dominant organization type is the word list with its definition and example sentences.

These apps can not able to attract a large population who are only depended on National Curriculum Board provided Textbook for learning English. In Bangladesh most of the primary, secondary level user uses Textbook for learning English. There is an App developed by National Curriculum & Textbook Board (NCTB) to provide ebook copy of NCTB approved books for free. This app is a onetime use only app for downloading e-copy of books accross the country.

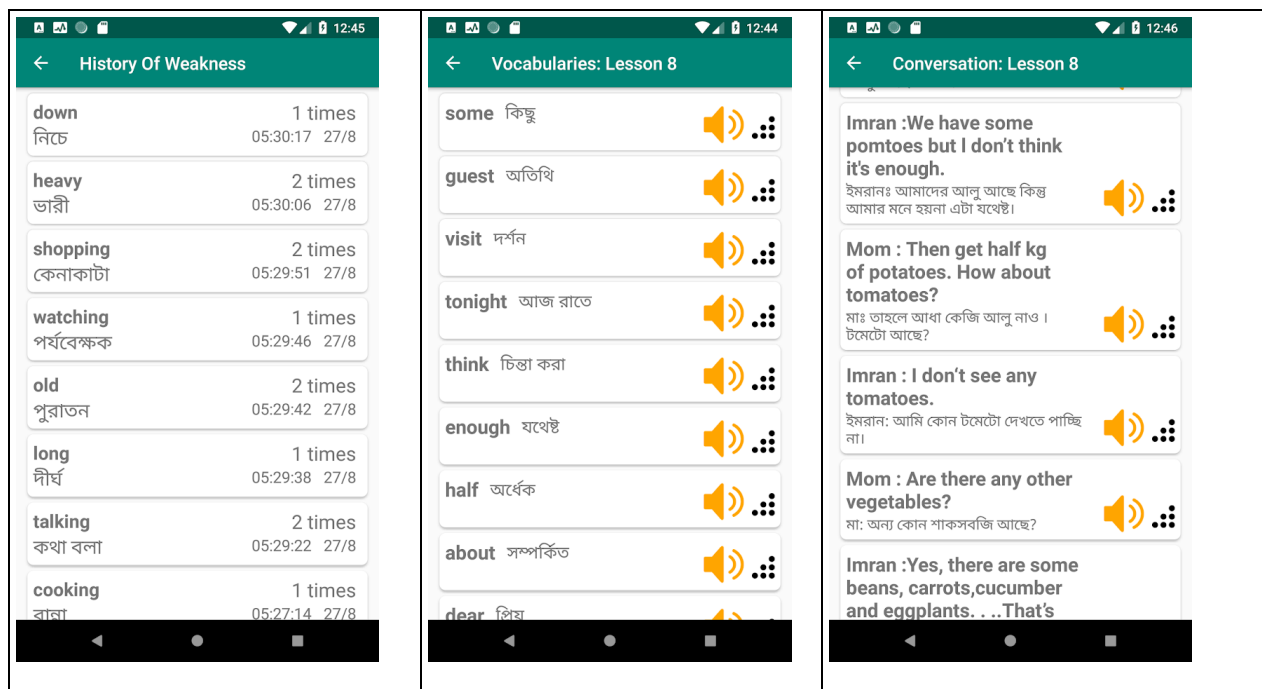
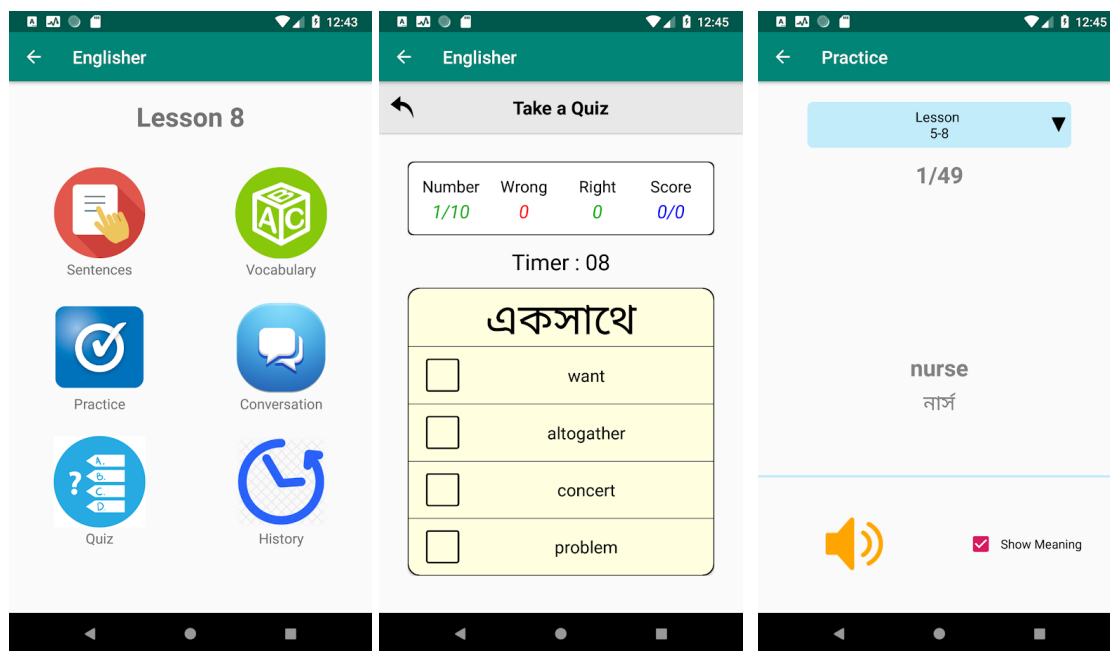
Some heavily used popular apps are emphasizing techniques for only toddlers whereas others assumed the users are adult. It has been seen that predominantly most the users of these applications are adults only. In Bangladesh apps users for learning English among school going students are nearly Zero percent. We anticipate to make an app useful among Bangladeshi pupil the app should contain the content of NCTB English Textbook's course curriculum.

Challenges [23], [24]

- a) Questions may arise from the pedagogue experts that the current education system is not yet prepared to offer this kind of education in all parts of the country.
- b) Successful integration of mobile app based English learning depends to some degree on students' and teachers' acceptance and awareness
- c) Not every student has a functional mobile device such as a smartphone or tablet. Since in Bangladesh most of the students are from under privileged family.
- d) Beside sometimes mobile devices such as regular cellular phones distract students' attention engaging in different activities rather than study.

Englsher Mobile App:

A mobile application (Englsher) is being created with content from the NCTB English Textbook. We have gathered all the words and sentences from the "English for Today" textbook for class six using NLP data mining techniques (such as: Lemmatization) [29], [30]. The data list for words and sentences is then cleaned by eliminating extra characters like apostrophes, commas, semicolons, etc. The keywords are organized into a number of categories sections, chapters, lessons, exercises, and quizzes. Each sentence's and word's Bengali meaning is provided in accordance with the chapter or lesson. A quiz is used to ascertain word meaning. Students can take quizzes, and their results are recorded in the history so that history can be reviewed and performance can be improved by more practice in the future. Students can learn how to respond to questions from a variety of options by taking the quiz. This app uses a quiz game-based learning strategy. For the following version, synonyms antonyms were proposed. The terms' synonyms will be shown, providing a wide selection of answers to the various questions pertaining to that subject. The app will provide example phrases to demonstrate how to use synonyms. Gradually, either teachers or pupils will learn how to properly and efficiently use specific words.



Methodology:

- Identify some popular mobile apps on the basis of google playstore review, number of user download in google play store.

- b) List all the the techniques used in those apps, to determine which technique may affect and could be promising or accepted by students.
- c) Develop questionnaire for teacher to explore the viewpoints of using mobile app based learning technology incorporation for learning English. Involve teachers in an interrogation session.
- d) Enlist all the results, observe it through rigorous analysis.
- e) We are expecting through this way we can find out most effective technique for teachers and students how the app can be built. We have anticipated a dummy version and build to demonstrate it infront of the survey participants so that we could get vauable feedback.

Survey Planning

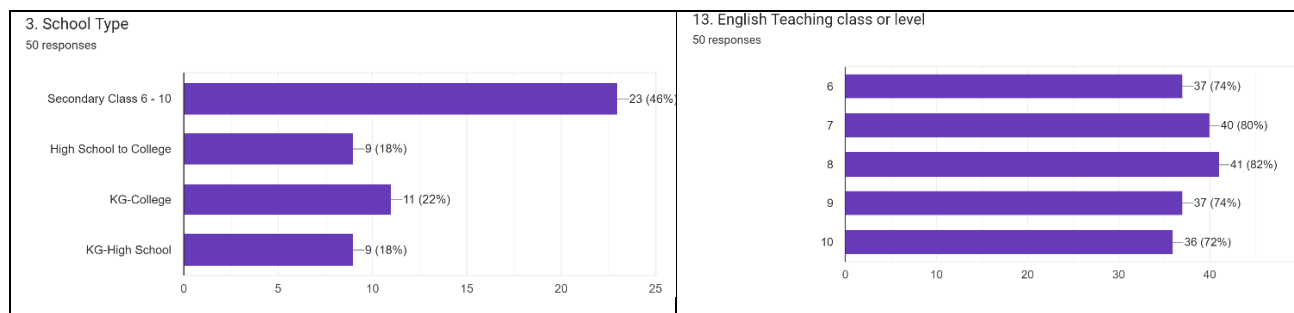
The survey was conducted over a period of four weeks, with 50 High schools in Dhaka and Bogura district of Bangladesh. It encompasses only English subject areas Teachers who teaches in high schools from class six to class Ten and teaches regularly in the school. A questionnaire was distributed to teachers allowing us to gather a well-rounded perspective on the utilization of digital mobile-based learning. The questions focused on aspects such as frequency of technology usage among students for learning daily class tutorials, preferred learning activities related to specific apps, perceived advantages, and areas for improvement for a proposed solution.

Survey Questionnaires

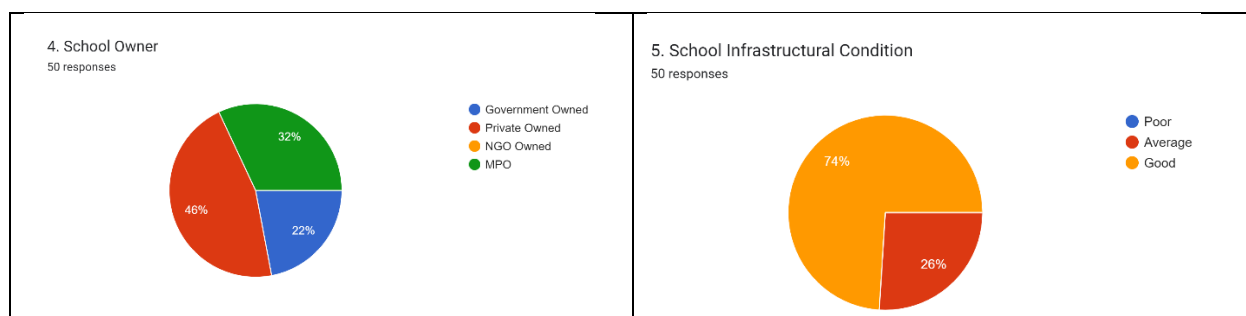
- School or Organization Details (name, School or Organization Location (full address), School Type (Secondary/High School etc)
- School Infrastructural Condition, Number of Students Estimated, Number of Students in Each Class or Section)
- Teachers Details (Name, Phone Number, Year of Teaching Experience)
- Teachers' Social Sites address (e.g. FB, LinkedIn, instagram etc)
- Graduation major was not English but currently teaching English subject
- English Teaching class or level
- Frequency of using digital content for teaching or digital medium for teaching and learning
- Internet or Mobile app to teach students or asked students to find solutions or learning materials from 16. Having experience of using mobile app for teaching and learning? Used internet or Mobile App such as (e.g. Youtube Tutorials)
- Do you think teacher will use a customized proposed mobile app for teaching
- Do you think students will use customized app for learning?
- Do you agree with the concept that mobile App and mobile based technology motivates students for learning English
- Do you agree with the concept that mobile App and mobile based technology App can replace guide book
- Do you think mobile app-based learning can improve English proficiency of students
- Any specific ideas How customized app can be improved specially for learning English for the context of Bangladesh
- Do you think Govt should promote these types of innovation for education sector

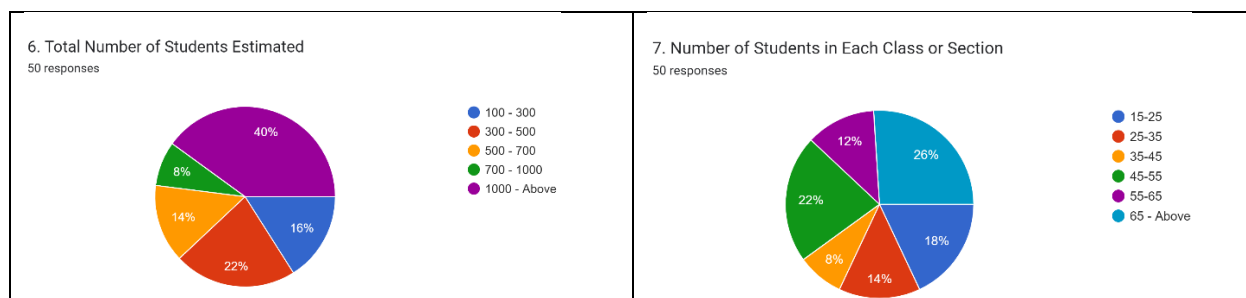
Survey Results:

We have done extensive analysis with the survey data collected. In our data collection highest priority is given for the secondary class student teachers who teach between 6-10th class about 46%. High school, KG college and KG High school. Details about the statistics are depicted in the following figure. Adjacent chart explains the percentage of teachers who teach in which class. Hence, from these two figures we can get a vivid image of collected dataset resources about the participating teachers.



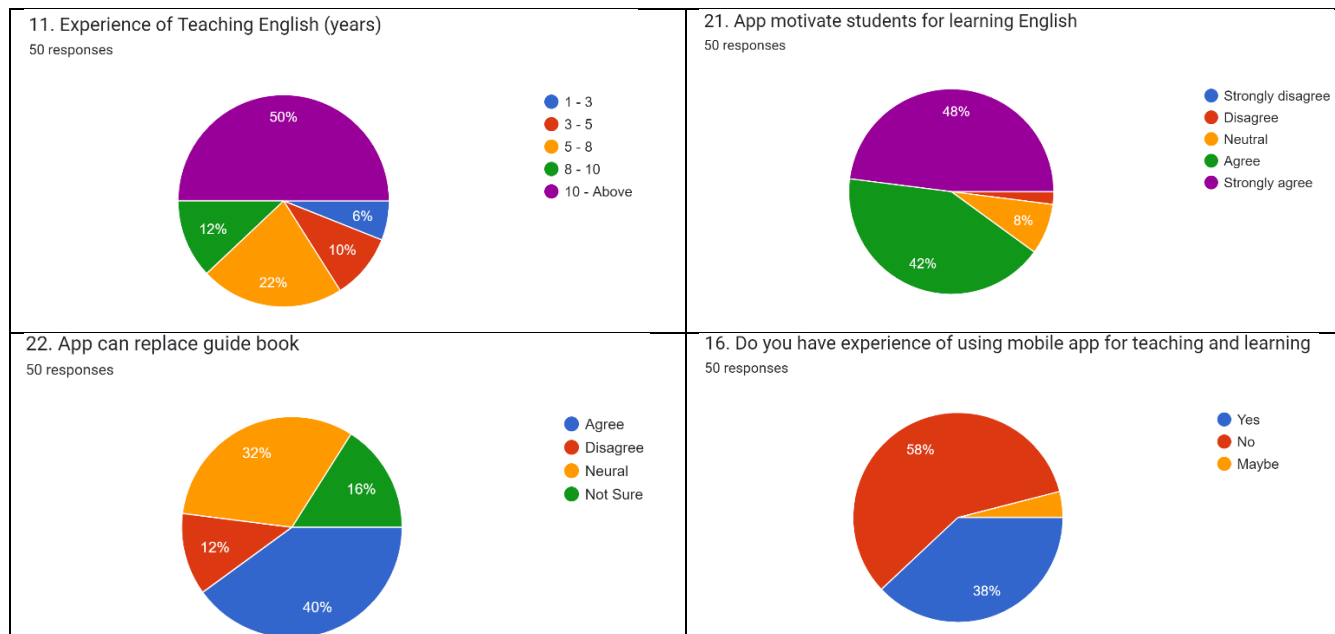
The infrastructure's overall quality and condition, which is generally above average, are shown in the following statistics. The majority of school owners are privately held 45%, yet there are some of variable quality. 32% of which are MPO institutes—non-government educational institutions that receive funding from the government nonetheless—and 22% of which are government institutes. There are quite a few students overall. Over 1000 students attend almost 40% of the institutions. A sizable number of pupils are present in each section and class. A significant percentage of classes—38%—have a size greater than 50. So, we can presume that the participating teachers have quite a bit of experience teaching a lot of children.





For the data privacy and security issues Teachers were reluctant to provide their social website address to the surveyor. Among 50 participants only 12 has, that means 24% attendees provided their social sites address to use them for research purpose.

The following graphs give an overview of the English teaching experiences of the teachers as well as the general consensus regarding the use of digital content and mobile apps in everyday teaching and learning. Almost 62% of teachers have been teaching for more than 8 to 10 years, and some of them have been teaching for decades in higher secondary education. 32% of teachers have three to eight years of experience, while just 6% are fresh to the profession. Around 83.7% of teachers The language of instruction during their graduation was English, and their major was also English. Very few teachers 13.3% graduation major is something other than English yet teaching English in secondary schools probably have sufficient English language proficiency.



Analysis Facts:

More than half of teachers, or 58%, have no prior experience utilizing mobile apps or technology for teaching, but 90% of them agree, and more than 45% strongly agree, that it encourages pupils

to engage actively in their learning. However, they (almost 60%) also hold the opinion that a notebook cannot be completely replaced, despite the fact that mobile apps may solve many problems and provide technological support for teaching and learning. Promisingly optimistic approximately 40%, although thinking that the notebook-based content memorizing learning method can be replaced, feel that mobile app-based learning can replace it permanently.

Questions	yes	No
Do you use digital content for teaching or digital medium for teaching and learning	84%	16%
Have you ever used Internet or Mobile app to teach students or asked students to find solutions or learning materials from internet or Mobile App such as (e.g. Youtube Tutorials)	76%	24%
Education during graduation was English and English was used for learning	83.70%	16.30%
Customized mobile app for Learning and Teaching English		
Do you think teacher will use this mobile app for teaching	92%	8%
Do you think students will use this app for learning?	80%	20%
Do you think mobile app based learning can improve English proficiency of students	86%	14%
Do you think Govt should promote these types of innovation for education sector	98%	2%

This study proposes the Englisher mobile app and presents it to the participating teachers to gather their insightful feedback. 92% of teachers reported that they would use this type of mobile app for teaching if it were made available after using the trial version of the offered customized Englisher app. Teachers anticipate that 80% of students will utilize this app during class. 86% of respondents believed it may help students' English proficiency, and 98% agreed that the government should support this kind of innovation in the education sector.

24. How Englisher app can be improved: The participants offer a variety of viewpoints for this question. Some of them mentioned that we could add additional vocabulary and involve more experience teachers who have greater experience in digital learning and teaching. Some participants, including teachers, made the suggestion that adding images, graphics would enhance the apps' usefulness and make them more visually appealing to users. More practice resources and exercise would be helpful. Practices for reading, writing, speaking, and listening are all possible. Another strategy is to provide antonym, synonym, and syllabus-related instances as well as audiovisual engagement with the app. Additionally, parental supervision may be used, and the app may benefit from parental comments to make improvements. The relevance of various terms used by participants is displayed in the word cloud below.

	How this app can be improved		How English learning can be improved using Mobile App	
Traditional LIWC Dimension	Answer Text	Average for	Answer Text	Average for
		Formal Language		Formal Language
I-words (I, me, my)	0	4.77	0	0.67
Positive Tone	2.54	3.96	3.91	2.33
Negative Tone	0	1.1	0	1.38
Social Words	2.54	6.87	5.65	6.54
Cognitive Processes	13.56	9.35	18.26	7.95
Allure	2.54	7.79	3.04	3.58
Moralization	0	0.2	0	0.3

Special Remarks:

For the data privacy and security issues Teachers were reluctant to provide their social website address to the surveyor. Among 50 participants only 12 have, that means 24% attendees provided their social sites address to use them for research purposes.

General Discussion and outcomes:

The study concludes apps seem effective as they provide a personal and learner-centered learning opportunity ubiquitously. However, apps need to be improved by including collaborative form of learning. Their recommendation is to make it specific. In our case we will make the app specific for NCTB Books only for particular class. This approach is also our goal considering NCTB Books.

The survey revealed that digital mobile-based learning significantly improved learning flexibility for the context of Bangladesh. Most of the participating teachers are enthusiastic about diverse Learning resources related to technology incorporating into pedagogy. Participants appreciated the diverse range of learning resources available through mobile devices, including interactive e-books, dictionary, educational apps, and multimedia content. Teachers admitted that available digital resources facilitated a deeper understanding of topics and catered to different learning styles, nurturing more engaging learning environment. This will positively impacted student motivation and overall engagement and hence boost overall learning. Some crucial suggestions were improve the graphics of the app so that it becomes interactive and parents involvement can be introduced. Based on the survey results, it is revealed the potential for digital mobile-based learning in school is immense. Government should take initiatives to incorporate it into course curriculum syllabus and could impose ordinance to adopt mobile app based learning teaching in the school.

Conclusion:

The school survey on digital mobile-based learning reaffirmed its potential to revolutionize education, promoting flexibility, engagement, and personalized learning experiences. In the survey questions, it was revealed teachers/instructors would find it acceptable and appreciated if textbook information were made available through a mobile app and presented in interactive format.

The study concludes apps seem effective as they provide a personal and learner-centered learning opportunity ubiquitously. Reveal to user as a complementary essential material to learn English Textbook quickly and effectively. However, apps need to be improved by including collaborative form of learning. Their recommendation is to make it specific.

By embracing this revolutionary approach, we aim to empower our students to become adaptive, tech-savvy learners, well-equipped to thrive in an increasingly digital world. The journey towards an empowered future of education has just begun, and we are committed to embracing the challenges and opportunities that lie ahead.

References

- [1] S. Report, "Schools of 0," *The Daily Star*, May 09, 2018.
<https://www.thedailystar.net/frontpage/schools-0-1573576> (accessed Jul. 28, 2023).
- [2] W. B. Habib and T. S. Adhikary, "English, maths drag results down again," *The Daily Star*, May 07, 2018. <https://www.thedailystar.net/frontpage/ssc-examination-result-2018-bangladesh-english-maths-drag-results-down-again-1572613> (accessed Jul. 28, 2023).
- [3] "Bangladesh Education Statistics 2021."
http://banbeis.portal.gov.bd/sites/default/files/files/banbeis.portal.gov.bd/npfblock/Bangladesh%20Education%20Statistics%202021_compressed-1-235.pdf (accessed Jul. 28, 2023).
- [4] B. B. of E. I. and Statistics, *Bangladesh Educational Statistics 2016*, First Edition. Bangladesh Bureau of Educational Information and Statistics, 2017.
- [5] J. Sandberg, M. Maris, and K. de Geus, "Mobile English learning: An evidence-based study with fifth graders," *Comput. Educ.*, vol. 57, no. 1, pp. 1334–1347, Aug. 2011, doi: 10.1016/j.compedu.2011.01.015.
- [6] S. Hu, K. Laxman, and K. Lee, "Exploring factors affecting academics' adoption of emerging mobile technologies-an extended UTAUT perspective," *Educ. Inf. Technol.*, vol. 25, no. 5, pp. 4615–4635, Sep. 2020, doi: 10.1007/s10639-020-10171-x.
- [7] R. Shadieff, T. Liu, and W.-Y. Hwang, "Review of research on mobile-assisted language learning in familiar, authentic environments," *Br. J. Educ. Technol.*, vol. 51, no. 3, pp. 709–720, 2020, doi: 10.1111/bjet.12839.
- [8] S. F. Isamiddinova, "Mobile Applications As A Modern Means Of Learning English," in *2019 International Conference on Information Science and Communications Technologies (ICISCT)*, Nov. 2019, pp. 1–5. doi: 10.1109/ICISCT47635.2019.9011897.

- [9] M. M. Elaish, L. Shuib, N. A. Ghani, and E. Yadegaridehkordi, "Mobile English Language Learning (MELL): a literature review," *Educ. Rev.*, vol. 71, no. 2, pp. 257–276, Mar. 2019, doi: 10.1080/00131911.2017.1382445.
- [10] B. Klimova, "Impact of Mobile Learning on Students' Achievement Results," *Educ. Sci.*, vol. 9, no. 2, Art. no. 2, Jun. 2019, doi: 10.3390/educsci9020090.
- [11] M. L. Bernacki, J. A. Greene, and H. Crompton, "Mobile technology, learning, and achievement: Advances in understanding and measuring the role of mobile technology in education," *Contemp. Educ. Psychol.*, vol. 60, p. 101827, Jan. 2020, doi: 10.1016/j.cedpsych.2019.101827.
- [12] S. Criollo-C, A. Guerrero-Arias, Á. Jaramillo-Alcázar, and S. Luján-Mora, "Mobile Learning Technologies for Education: Benefits and Pending Issues," *Appl. Sci.*, vol. 11, no. 9, Art. no. 9, Jan. 2021, doi: 10.3390/app11094111.
- [13] X. Chen, "Evaluating Language-learning Mobile Apps for Second-language Learners," *J. Educ. Technol. Dev. Exch.*, vol. 9, no. 2, Dec. 2016, doi: 10.18785/jetde.0902.03.
- [14] V. N. Hoi, "Understanding higher education learners' acceptance and use of mobile devices for language learning: A Rasch-based path modeling approach," *Comput. Educ.*, vol. 146, p. 103761, Mar. 2020, doi: 10.1016/j.compedu.2019.103761.
- [15] K. R. M. Rafiq, H. Hashim, and M. M. Yunus, "Sustaining Education with Mobile Learning for English for Specific Purposes (ESP): A Systematic Review (2012–2021)," *Sustainability*, vol. 13, no. 17, Art. no. 17, Jan. 2021, doi: 10.3390/su13179768.
- [16] Z. Yu, W. Xu, and P. Sukjairungwattana, "Motivation, Learning Strategies, and Outcomes in Mobile English Language Learning," *Asia-Pac. Educ. Res.*, vol. 32, no. 4, pp. 545–560, Aug. 2023, doi: 10.1007/s40299-022-00675-0.
- [17] Z. Xu, Z. Chen, L. Eutsler, Z. Geng, and A. Kogut, "A scoping review of digital game-based technology on English language learning," *Educ. Technol. Res. Dev.*, vol. 68, no. 3, pp. 877–904, Jun. 2020, doi: 10.1007/s11423-019-09702-2.
- [18] Y. Hao, K. S. Lee, S.-T. Chen, and S. C. Sim, "An evaluative study of a mobile application for middle school students struggling with English vocabulary learning," *Comput. Hum. Behav.*, vol. 95, pp. 208–216, Jun. 2019, doi: 10.1016/j.chb.2018.10.013.
- [19] B. Klímová and A. Berger, "Evaluation of the Use of Mobile Application in Learning English Vocabulary and Phrases – A Case Study," in *Emerging Technologies for Education*, T. Hao, W. Chen, H. Xie, W. Nadee, and R. Lau, Eds., in Lecture Notes in Computer Science. Cham: Springer International Publishing, 2018, pp. 3–11. doi: 10.1007/978-3-030-03580-8_1.
- [20] C.-H. Chen and C.-C. Tsai, "In-service teachers' conceptions of mobile technology-integrated instruction: Tendency towards student-centered learning," *Comput. Educ.*, vol. 170, p. 104224, Sep. 2021, doi: 10.1016/j.compedu.2021.104224.
- [21] I. García-Martínez, J. M. Fernández-Batanero, D. Cobos Sanchiz, and A. Luque de la Rosa, "Using Mobile Devices for Improving Learning Outcomes and Teachers' Professionalization," *Sustainability*, vol. 11, no. 24, Art. no. 24, Jan. 2019, doi: 10.3390/su11246917.
- [22] H. Oz, "An Investigation of Preservice English Teachers' Perceptions of Mobile Assisted Language Learning," *Engl. Lang. Teach.*, vol. 8, no. 2, pp. 22–34, 2015.
- [23] J. Kacetl and B. Klímová, "Use of Smartphone Applications in English Language Learning—A Challenge for Foreign Language Education," *Educ. Sci.*, vol. 9, no. 3, Art. no. 3, Sep. 2019, doi: 10.3390/educsci9030179.
- [24] Z. Jie and Y. Sunze, "Investigating pedagogical challenges of mobile technology to English teaching," *Interact. Learn. Environ.*, vol. 31, no. 5, pp. 2767–2779, Jul. 2023, doi: 10.1080/10494820.2021.1903933.

- [25] R. Metruk, "The Use of Smartphone English Language Learning Apps in the Process of Learning English: Slovak EFL Students' Perspectives," *Sustainability*, vol. 13, no. 15, Art. no. 15, Jan. 2021, doi: 10.3390/su13158205.
- [26] M. Shortt, S. Tilak, I. Kuznetcova, B. Martens, and B. Akinkuolie, "Gamification in mobile-assisted language learning: a systematic review of Duolingo literature from public release of 2012 to early 2020," *Comput. Assist. Lang. Learn.*, vol. 36, no. 3, pp. 517–554, Mar. 2023, doi: 10.1080/09588221.2021.1933540.
- [27] P. Poláková and B. Klímová, "Mobile Technology and Generation Z in the English Language Classroom—A Preliminary Study," *Educ. Sci.*, vol. 9, no. 3, Art. no. 3, Sep. 2019, doi: 10.3390/educsci9030203.
- [28] R. Kaliisa, E. Palmer, and J. Miller, "Mobile learning in higher education: A comparative analysis of developed and developing country contexts," *Br. J. Educ. Technol.*, vol. 50, no. 2, pp. 546–561, 2019, doi: 10.1111/bjet.12583.
- [29] A. Kao and S. R. Poteet, *Natural Language Processing and Text Mining*. Springer Science & Business Media, 2007.
- [30] P. M. McCarthy and C. Boonthum-Denecke, Eds., *Applied Natural Language Processing: Identification, Investigation and Resolution*. IGI Global, 2012. doi: 10.4018/978-1-60960-741-8.
- [31] "Welcome to LIWC-22." <https://www.liwc.app/> (accessed May 06, 2023).
- [32] "The Psychological Meaning of Words: LIWC and Computerized Text Analysis Methods - Yla R. Tausczik, James W. Pennebaker, 2010." <https://journals.sagepub.com/doi/abs/10.1177/0261927x09351676> (accessed Jul. 28, 2023).