

UTILISING ICT TO SUPPORT BOTH CLASSROOM AND EXTRACURRICULAR LEARNING

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ABSTRACT

ICT has impacted and changed a wide range of aspects of our lives. Students and teachers may both learn in novel ways thanks to ICT in education. This prompts new worries about the "digital divide" and the availability of ICT tools and resources for those who are less well-off. ICT use in schools has a considerable positive impact on core academic subjects like reading and math. Everything is connected to ICT, ensuring speedy and accurate information delivery. In this study paper, several ICT platforms—such as Google's G Suite, social networking sites, and the flipped classroom—that are effective for studies outside of the classroom are investigated. This study article has looked at how ICT may be utilised for remote learning. Additionally, the flipped classroom, which is crucial for instructing students outside of the classroom, has been thoroughly covered. The usage of various handheld gadgets for learning outside of the classroom is then highlighted. In addition to Wikipedia, social networking sites like YouTube, Facebook, WhatsApp, Instagram, and others may be utilised for studying outside of the classroom. In the end, it can be concluded that the primary goal of adopting ICT is to get more productivity in a shorter amount of time.

Keywords: flipped classroom, Google's G Suite, Hand-held devices, social networking platform, Wikipedia

Introduction

Learning beyond the classroom refers to the use of places other than the classroom for teaching and learning. Taking classroom lessons outside can enhance a student's educational experience (Kissling, 2014). This can assist with challenging subjects and also provide perspective for them in the actual world. 60% of teachers said that their students' self-assurance, resilience, and general wellness had improved after the school visit (McDonald et al., 2013). 61% of students obtained grades that were better than expected after the visit. 67% of respondents identified cost and organisation as the key barriers to promoting more learning outside of the classroom (Rockwell et al., 1999).

Opportunities for teaching and learning outside of the classroom provide various benefits for both students and teachers. Students actively participate in experiential learning to understand the world around them (Wurdinger et al., 2009). They face real issues, form original hypotheses, test workable solutions, and form relationships with others. Many of the goals outlined above may be accomplished in college classrooms by using field trips as a tool (Windschitl, 2004). Field trips are a common component of many K–12 course curricula. Teachers must be flexible and prepared to cope with outcomes that are not favourable for their pupils (Claiborne et al., 2020).

During the course, instructors and students work with a neighbouring institution or organisation, or they go there to complete assignments with due dates (Turban et al., 2008). The class travels to a remote place for a day or perhaps just a week to focus on a certain topic or interesting endeavour (Markuset al., 2003). Certain outdoor learning activities, like geological field trips or wilderness literary hiking treks, are by nature regressive because to their length. There are several different models for study abroad programmes. In some cases, participants enrol as visiting, non-matriculated students at foreign universities (Kim et al., 2012).

Educational institutions are stepping up their attempts to go global by giving students the chance to go on short-term, faculty-led study abroad trips. There is no set rule for how much time should be spent on classroom instruction or fieldwork (Oh et al., 2021). The teachers should be prepared to apply risk management strategies while bringing students on field trips. They must know how to contact campus security, administration, the transit system, sexual assault counsellors, and nearby emergency services (Garcia et al., 2012). Students can access content that is restricted to a particular location and only available when visitors arrive at that location with the right applications (Rose David, 2000). Students can use mobile devices to create location-specific content while on a field trip or independently. The ornithology lecturer requires his students to "post" about the birds they see in their everyday surroundings (Giemza and Hoppe, 2013). Students aggregate their data while in the field, analyse it using geographic visualisation tools, and then present their findings (Vogel Bahtijar et al., 2010).

Enhancing young people's understanding, capabilities, values, and personal development can significantly boost learning and achievement. The importance of excellent education outside of the classroom cannot be overstated

(Meece et al., 2006). What we hear, taste, touch, smell, and do all give us six important "mechanisms to knowledge." Learning outside of the classroom may enhance academic performance across a range of topic areas as well as personal and social development. Since fieldwork provides direct and relevant experiences that enhance and deepen learning, every young person has a right to take part in it as part of their geography studies (Kuh et al., 2013).

Outside-the-classroom learning opportunities are a successful teaching and learning strategy. It has been shown to increase success and achievement, enhance conduct, and enhance engagement for all groups of students, even those who find it difficult to participate in class (Valls and Leonidas, 2013). How a youngster engages with an idea or subject can be greatly influenced by the "areas" in which learning takes place.

In order to be educated, one does not necessarily need to prepare for and pass college exams. In addition to academic disciplines, people also study and practise a wide range of extracurricular activities, hobbies, skill development, sports, and adventurous activities (Marks Helen, 2000). The surroundings act as their own classroom, offering both learning opportunities and obstacles. Attending adventure camps, playing sports, developing our skills and hobbies, and learning about photography, painting, music, dance, and singing are just a few of the many activities that fall under the umbrella of outdoor learning. Finally, one is given a chance by walking, working out, and gaining more mental clarity (Erwin Jonathan, 2004).

By substituting outdoor learning for traditional classroom education, students might gain an appreciation for different environments and pursuits that enhance their skills and conceptual understanding (Fauville et al., 2014). Opportunities for learning outside of the classroom are different from the traditional method. It helps students develop a range of soft skills, including leadership, teamwork, and negotiation (Vogler Jane et al., 2018). By having courses outside, teachers may make learning interesting in a real-world environment. Through outdoor classes, students are introduced to a variety of STEM careers (Beames et al., 2012).

They are very beneficial for increasing learner engagement and building self-esteem. It also assists teachers in teaching students more comprehensive learning approaches (Pellas Nikolaos, 2014). It takes the full body to learn outside, including the legs, arms, eyes, and ears. It keeps learners occupied and makes sure their brains are working properly (Doidge Norman, 2007).

The structure of this study is as follows: Section 2 addresses Technology in the classroom. Section 3 discusses at considerable length about ICT tools for learning outside of the classroom setting. This section covers the flipped classroom, Google's G Suite, mobile devices, social networking sites, and Wikipedia. Section 4 discusses distance learning using ICT. The consequences of ICT both within and outside of the classroom were then covered in Section 5. Section 6 discusses planning for data collecting, data collection, participants, resources, and methodologies. The examination of the data gathered is then discussed in Section 7. Results of the data analysis are described in Section 8. Section 9 highlights the importance of on discussions of the findings. Section 10 is designated as the conclusion.

ICT in the classroom

ICT has evolved into a crucial tool for ensuring that learners receive a comprehensive education at all times, enabling them to develop all of their digital aptitudes and abilities. Because of the speed of these technologies, we are still able to conduct online classes and post information to other educational websites while maintaining our existing pace of work (Dede Chris, 2010).

ICT integration in education refers to the use of ICT by instructors to introduce, reinforce, expand, develop, assess, and improve students' understanding of curricular objectives. Effective ICT integration in education cannot be achieved without your support as a teacher (Falloon Garry, 2020). The Australian Curriculum recognises ICT capabilities as general competencies or 21st century skills. Instructors are asked to use a range of ICT tools, approaches, and resources to support ICT-enabled teaching and learning (Bocconi et al., 2012).

If you follow these recommendations, you will be well on your way to equipping your students with 21st-century skills. Although there are several ways to integrate ICT into teaching and learning, if you want to succeed as a teacher, it's important to stick to these principles (Kivunja Charles, 2014).

Educational institutions use a range of ICT technologies for communication, information generation, transmission, storage, and management. In some circumstances, ICT is becoming important for interactions between teachers and students. Teachers must possess digital literacy and knowledge of how to integrate ICT into the curriculum. Tablets are adaptable learning tools since they can be downloaded with cheap educational

software. E-readers are electronic reading devices that have digital storage capacity for hundreds of volumes (Wood Ruth and Jean Ashfield, 2008; Sihare, 2022).

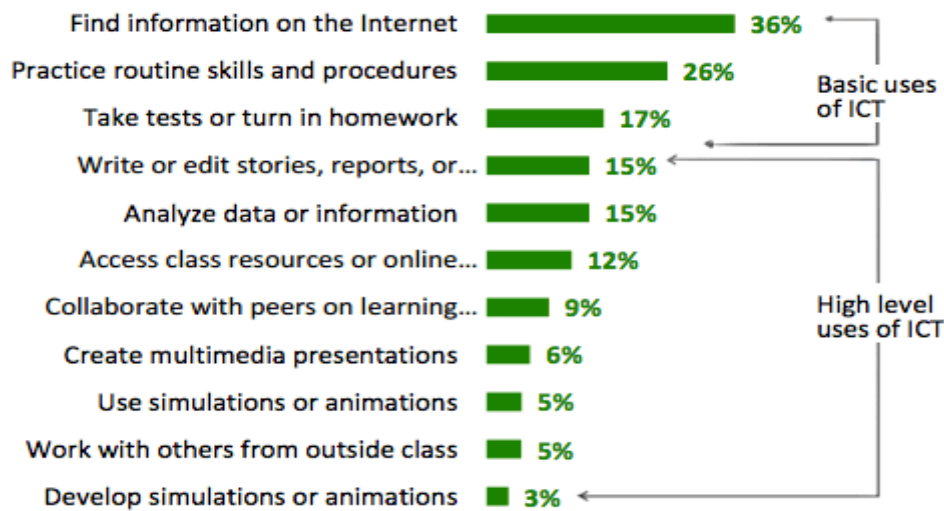


Fig. 1 Students can access ICT¹

The flipped classroom paradigm mixes lectures and practise outside of class with in-class instruction using computer-guided education and interactive learning activities. Teacher policies must place equal emphasis on discipline-specific applications, ICT literacy abilities, and ICT use in educational contexts. According to educational institutions, all students should have equal access to ICT tools for learning. For digital content, local language and cultural development are necessary. Less minority-group pupils are likely to have home internet and computer access (Besigomwe et al., 2022).

ICT can provide a variety of options for taking in and processing information, understanding concepts, and articulating what has been learned. There are also special needs student assistance programmes available for mobile devices (Laurillard Diana, 2007).

In the classroom, computers are used to make the switch from analogue to digital. Some of your learners can start using certain ICT tools in your classroom. Once they learn how to use them, they will be able to train other students and you as the teacher (Fig. 1).

ICT Resources for learning outside classroom

Cloud computing, tablets, and virtual reality might all have an impact on education. Some professors have embraced the "flipped classroom," where pupils control their own learning at home. Mobile technologies are already taking the place of the idea that education must take place in a classroom. The exponential expansion of online distance learning is a sign of the movement away from traditional classroom-based education. While the age of individualised learning may be only getting started, the era of classroom-based education may be coming to an end (Parsons David, 2016; Sihare, 2023).

Since online distance learning has grown so dramatically in recent years, students can now acquire full degrees and work-based certificates without ever having to set foot inside a classroom. Technology may still be helpful in topics where students need to improve today (Parsons David, 2016).

i) Flipped classroom

The flipped classroom combines teaching and learning methods. By demanding that every student finish their homework outside of class and having them work on real-world issues in class, it aims to increase student engagement and learning. This educational strategy eliminates activities from the classroom that may be considered homework. In a flipped classroom, pupils engage in and assess their own learning while actively contributing to the creation and acquisition of knowledge. Problem-solving, collaboration, design, and other higher-order cognitive skills can be given additional time. In flipped classrooms, in-class activities are redesigned to offer a very diversified curriculum (Gilboy et al., 2015).

¹ <https://elearningindustry.com/time-level-use-ict-in-your-classroom>

Proponents assert that there is no one "right" strategy for reverse orbit. In the 1970s and 1980s, flipped learning became quite popular, which required students to master one subject before going on to another. After acquiring the requirements, students in a flipped classroom see each lecture before completing each activity or assignment (Sewell Jr and William, 1990).

Advocates claim that most students can complete a whole year's worth of work in a very short amount of time due to its efficacy. While more individualised instruction is provided for slower learners, advanced students work on their own projects. Despite the fact that some students may not have been familiar with the course material, they nonetheless demonstrated their competency on the assignments they completed (Arlin Marshall, 1984, Sihare S. R. (a), 2017).

The flipped classroom is a teaching strategy that prioritises student-centred teaching and application-based learning. The flipped classroom encourages students to understand the underlying reasoning behind the subject being provided rather than "cramming" for the test. Some contend that the flipped classroom model increases pupils' screen usage at a time when they already spend excessive amounts of time in front of devices. Preparation may take longer since producing high-quality videos requires instructors to put in a lot of time and effort outside of their typical teaching obligations. Outside of the classroom, audio pedagogy was applied through the use of videos and information slides. Software that assembled all the sources that students needed to complete their assignments outside of class was supplied in some classes (Farooque and Sadiya, 2020).

The flipped classroom is an improvement on the traditional classroom teaching method. Students are also encouraged to attend extra open lectures in order to learn more. In a flipped classroom, adaptive lessons are used to fulfil half of the pre-class preparation for the curriculum. Utilizing Smart Sparrow, a commercial adaptive platform that combines video lectures, courses, and evaluation through multiple-choice and algorithmic questions, increases the benefits. Children with disabilities might experience less stigma and have their perspectives changed with the aid of inclusive educational institutions.

Flipped learning can be implemented in regular teacher-led classes or integrated into them. Before and after each (traditional or flipped) class, anonymous assessment items on a Likert scale can be recorded (McLaughlin Jacqueline et al., 2014, Sihare S. R.(b), 2017) (Fig. 2).

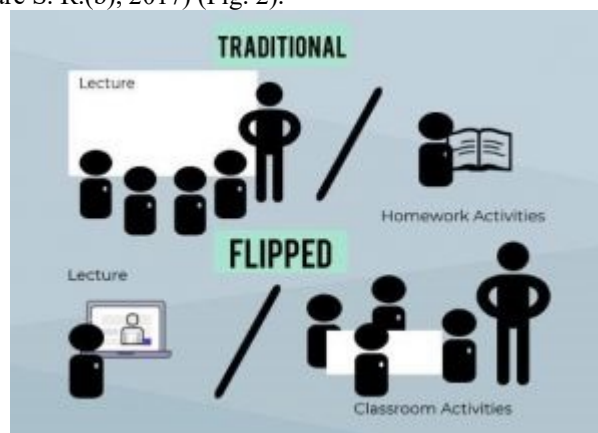


Fig. 2 Traditional vs. Flipped classroom²

ii) Google's G Suite

With G Suite for Education, Google intends to break down boundaries between teachers and students. The business has also produced G Suite Enterprise for Education, which contains additional capabilities targeted towards significant institutions. Subscribers also get access to one-on-one support from Google's education partners. G Suite for Education uses the same infrastructure as Gmail, and all advertisements are turned off. G Suite services, including Gmail, Google Calendar, Google Drive, and Google Sites, will be available at least 99.9% of the time (Constantinou and Elis Kakoulli, 2018).

Google servers will keep a duplicate of your information in the event that your computer is stolen or lost. Using G Suite, you can control who gets access to your data and how it is shared with them.

² <https://teach.ufl.edu/resource-library/flipped-classroom/>

G Suite for Education, a complete collection of cloud-based tools, provides collaboration, productivity, and communication tools for teaching and learning. This gives IT managers the ability to change the services provided on campus. For educational organisations like schools, the cloud provides benefits, including a simpler migration to it and tighter control over enormous amounts of data. How academic institutions cooperate, communicate, store, and access data is changing thanks to G Suite for Education. By building educational infrastructure on top of Google Cloud, schools and institutions can provide teachers, staff, and students all the tools they need to flourish in today's educational environment (Constantinou and Elis Kakoulli, 2018; Sihare, 2018).



Fig. 3 G Suite for education³

iii) Hand-held devices

Because handheld devices are small and lightweight, they may be stored in a pocket, handbag, or briefcase. The portable gadgets provide the one-to-one ratio required for meaningful technological innovation in education, according to the district's technology director.

The majority of third-party PDA (personal digital assistance) software is created primarily for profit. Students can carry their course materials more conveniently thanks to gadgets. The assignment is sent to the teacher's PDA using the device's infrared connection capabilities. It is "easier to use, more inexpensive, and more dependable" than a laptop (Salmon Gilly and Palitha Edirisingha, 2008).

Teachers are integrating digital advancements into the classroom. The goal is to make education more "targeted, customizable, and real-world focused." In educational institutions, devices and other tablets are becoming increasingly prevalent. Tablets and phones both have similar functions, but phones are more portable. Smart tables are reorienting information and making it more approachable for people of all ages. They can be networked together or linked to the classroom's technology infrastructure.

Students at half of American colleges and universities have access to free digital textbooks, according to estimates from digital textbook vendor Boundless. Instead of essays and self-evaluation tools, cameras are being used to generate academic material more frequently than previously. In educational institutions of all sizes, audio augmentation technology is being adopted. Wireless microphones are used to transmit the instructor's speech to speakers positioned around the classroom. Thanks to directional sound speakers, students may engage in activities from different sections of the classroom without disturbing others (Dahlstrom et al., 2013).

Options are expected to expand. The control centres for the teachers help the high-tech classrooms run smoothly. Even though technology is revolutionising the industry, many educational institutions still struggle to invest in brand-new, cutting-edge facilities due to budgetary restrictions. On the practicality and appropriate implementation of networked learning environments, many experts differ (Fig. 4).

³ <https://blog.tcea.org/g-suite-edu-questions/>



Fig. 4 Various handheld educational tools used outside of the classroom⁴

iv) Social networking platforms

We believe social media has the power to simplify almost everything. There are several ways that social media may be utilised for education, from announcing e-learning to conducting live lectures. Teachers can communicate with students in Facebook groups while keeping a professional distance. Students can create their own Instagram profiles to convey digital content in an aesthetically pleasing manner. Teachers may use Twitter as a discussion board or platform for their courses (Lomicka Lara and Gillian Lord, 2016).

Pinterest is a fantastic social media platform where teachers can organise their lesson ideas and worksheets for their students. Students may also use it to create a digital bibliography for their essays, group projects, and research assignments. Higher education marketing makes extensive use of social media. Putting special occasions and extracurricular activities on display might set your school apart from the competitors. Making Facebook groups for current and former students might promote a sense of belonging and school spirit. The use of social media management tools can guarantee that material is posted to each of your school's social media networks (Fig. 5) (Lea et al., 2011).

Teachers use Skype to speak with their students as well as to connect them with "pen pals" who are spread out across the globe. Today, Skype may also be used for larger group projects, such as partnering students who are interested in the same subject. Teachers may use Facebook to get their students involved in active learning. When creating study boards and organising resources, teachers and students can both benefit from utilising Pinterest. As a history class project, you might give students the assignment of choosing the most spectacular historical buildings or monuments in their city, compiling information about them, and organising it on a Pinterest board. LinkedIn is now the most well-liked business network and may be used in the classroom. Students can practise utilising social media for teaching by using Flickr and Instagram. On LinkedIn, there are many companies, including colleges and universities, as well as several official organisations for certain niche markets like colleges, degree programmes, etc. (Lea et al., 2011).

Through social media, parents, teachers, and students may all immediately connect. If used effectively, social media might enhance the learning experience for every student in the classroom. It is vital to comprehend how social media impacts education before integrating it into the classroom.

⁴ <https://firstmonday.org/ojs/index.php/fm/article/view/3932/3643>

At first glance, incorporating YouTube in the classroom could seem like a challenging task. To help professors and students make the most of "essential" websites, we have put together a few recommendations. A 2014 Ofcom poll found that "one in three children had a tablet at home," increasing the chance of giving them "video" homework.

YouTube's features encourage the usage of instructional videos because it's simple to upload and share new content. Unofficial educational videos on YouTube have become essential to students' learning. The demand for new learning platforms is underscored by the popularity of YouTube channels and videos from non-institutional sources. In instructional movies, common people have occasionally portrayed themselves as specialists (Duffy Peter, 2008).



Fig. 5 Various social media platforms are utilised to educate people outside of traditional classrooms⁵

YouTube is becoming a resource for information about subjects related to science, technology, and medicine. Whether watching movies may alter viewers' attitudes, behaviours, or knowledge has been the subject of studies. Studies show that instructional movies are more effective for learning than other resources like books or the internet. evaluated the clarity, quality, and content commitment of medical textbooks, e-medicine, and YouTube videos as they related to the cardiovascular system. E-learning tools or multimedia presentations help students learn more when compared to traditional teaching methods ((Duffy Peter, 2008)).

v) Wikipedia

Wikipedia is the world's largest online encyclopaedia. In our opinion, Wikipedia represents a well-developed digital cultural system. We claim that learning happens as a "side effect" of this virtual acculturation process. It is feasible to argue that an educational organisation should be allowed access to the online community's virtual space. Students and teachers must leave their "comfort zones" and the enclosed physical space of the classroom in order to encounter a foreign cultural environment.

Outside of the classroom, which is a "protected," walled-off, and culturally recognised area, this acculturation process takes place. The educational benefits are determined by the challenging application process to join the Wikipedia online community. Virtual acculturation occurs in environments with real social interactions and peer-to-peer editing transactions. It occasionally has the impression of being an "aggressive" or "unfriendly" atmosphere, full of virtual threats like cyber trolls, flamethrowers, edit battles, etc. (Guillén et al., 2020).

New users can quickly communicate with other community members because of Wikipedia. The technologies that are available have a direct impact on how people behave, and education is always ingrained in the cultural milieu of a knowledge community. Even the most sophisticated ITS cannot solve the inherent complexity of a networked human (Intelligent Tutoring System). Learning, acculturation, and acculturation are all interrelated

⁵ <https://medium.com/@braydenfox/social-media-and-education-using-social-media-for-better-academic-results-804b7a41a825>

ideas. Community learning is being used more and more in online environments. The Wikipedia community exhibits the traits of a professional community. The expression alludes to two related characteristics: something that a group of individuals has in common and something that distinguishes them considerably from other groups to which they are seen to belong (Jonassen David and Lucia Rohrer-Murphy, 1999).

Distance Learning Using ICT

Education is the most important investment that societies, families, countries, and individuals can make for the future. In the twenty-first century, the use of information technology has multiplied. Effective ICT integration into the educational system is a challenging, comprehensive process that includes not just technology but also curriculum and pedagogy. Information and communication technology (ICT) is referred to as a "diverse set of technical tools and resources used to communicate, as well as generate, transfer, store, and manage information." ICT includes a wide range of devices like computers, the Internet, radio, television, and telephones. Networked PCs and the Internet are the ICTs that facilitate interactive and collaborative learning the best. A new era of distance learning has so far been ushered in by the use of voicemail, email, teleconferencing, and computer-based integrated telephony and multimedia technologies. A single teaching method may not be the most effective for all learning needs, and every technology has benefits and drawbacks of its own. Selecting the best medium for a learning package is a challenging decision that is influenced by a number of elements, including the specific learning objectives of the unit (Kirkup Gill and Adrian Kirkwood, 2005).

The primary objective of providing distance education courses is to keep students from feeling disconnected from their studies. Electronic media includes, among other things, radio, television, computers, and the Internet. Libraries, educational institutions, and hospitals are just a few of the sectors where ICT usage has increased dramatically over time. Information and communication technology (ICT) is vital in distance learning to meet the wide range of student expectations. ICT uses a range of devices and software that may be adjusted to the demands of students at various academic levels and in a wide range of contexts. This has made information accessible and usable from anywhere at any time.

Impact ICT outside and inside of the classroom

Computers may be used in educational settings and computer literacy programmes for good reasons. You can think of customers, hardware, electronic resources, and implementation while analysing the demand for infrastructure. The selection and distribution of hardware and software are key factors in how well computers are used in classrooms. Teachers may need to be involved and ready since certain software programmes are simpler to integrate into the curriculum than others. It is essential that pupils have sufficient access to the required tools (Cuban et al., 2001).

High-end computers must be available to teachers and students around the clock, no matter where they are. Most programmes require students to have immediate access to a computer. Purchasing enough computers could be difficult due to their high cost. Equipment that is not fit for the needs of the students is routinely purchased by educational institutions. The volatility of the technology reduces the usefulness of using computers as a work completion facility (Cuban et al., 2001).

Methods and Materials

Planning of data collection

To find out how often people use electronic devices outside of the classroom for learning, a survey was undertaken. Information was gathered from the specified students for this investigation. The majority of students were initially invited, however some students did not answer or took a long time to react and were not considered in the survey. Students from all levels scored similarly on the survey. Students from all academic disciplines, including the arts, business, science, medicine, engineering, polytechnics, etc., have been given equal weight. Equal numbers of male and female students took part in this survey. The identical kind of inquiry was addressed of both male and female students.

We created a qualitative questionnaire before gathering the student's data. The questionnaire wasn't sent to all the students until it had been examined two or three times. We discovered that the questionnaire was missing some important information after distributing it to the students. As a result, following the distribution of the questionnaire, each student received a subseries of follow-up questions. Our proposal was soon answered by some students. Despite some students taking longer than anticipated to answer, we nevertheless got all the survey results we needed from the required students.

Although we made an effort, the information provided by the questionnaire about students' usage of electronic devices for reading outside of the classroom was insufficient. As a result, we experimented with other

techniques, like meeting students in person and addressing the problem. This was explained to the students before the address. Furthermore, we only selected students who had prior exposure to it. They had no trouble answering the question because they had received the questionnaire in advance.

Questions were asked of the students up till the study's objective was accomplished. During the verbal discussion, student strength was also taken into account. There were many students at certain colleges while there were few at others. There were many of students studying business and the arts, but not as many pursuing engineering or becoming dentists. The sample set was created with the amount of college students in mind.

Before beginning any of the aforementioned work and only after information had been gathered for this study through a variety of media, students were also invited. Just a handful of the various formats that interactions may take include email, verbal contact, and social networking. We employed all of these mediums, as well as technology, to obtain information more quickly. We used electronic media to the fullest extent possible since it was simple to get and assess information.

They were informed of the reason for information gathering prior to the verbal data collection so they could be completely honest with us. The study-related questions that were fact-related were only posed once all of their inquiries had been answered.

Data collection and participants

Data collection for this study took place in November and December 2022. We invited the target students to participate in this study, as was previously mentioned. The majority of students agreed to participate in the survey. But we only chose students who were previously familiar with our research. To determine how many students would use electronic devices for study outside of the classroom and draw the appropriate conclusions as a result, we chose students from various levels. The sample size was maintained at a suitable level in order to ensure the correctness of the data that was gathered. The students were separated into groups for convenience's sake so that the data could be gathered effectively. Each group consisted of ten students and was given a distinct set of questions. To better comprehend the students' individual issues and other difficulties, verbal interaction was had with them. Understanding the issues facing students is crucial in order to comprehend the justifications for the proposed research. Despite several sections being left blank, the majority of students answered the questionnaire.

Table 1. Participants' overall invitation, response, and participation rate

	Invitation		Participates		Male invitation and participation		Female invitation and participation	
	Male	Female	Male	Female	Mean	SD	Mean	SD
Primary	340	470	321	456	661	13.44	463	9.90
Secondary	390	380	354	300	744	25.46	340	56.57
Higher Secondary	400	450	356	378	756	31.11	414	50.91
Undergraduate	650	600	568	457	1218	57.98	528.5	101.12
Postgraduate	400	400	213	245	613	132.23	322.5	109.60

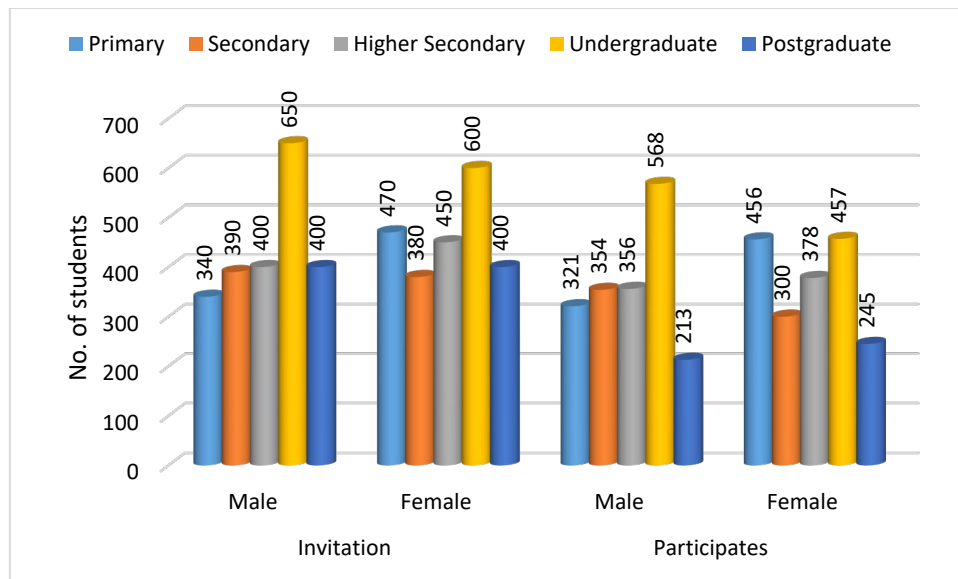


Fig. 1 Graphical representation of Table 1 collected data

Table 2 The use of the Internet by students for academic purposes outside of the classroom

	strongly agree		agree		neutral		disagree		strongly
	Male%	Female%	Male%	Female%	Male%	Female%	Male%	Female%	Male%
Primary	47.35	48.25	38.94	38.38	10.9	10.31	1.87	1.75	0.93
Secondary	49.72	49.33	41.81	42.33	5.93	6.33	1.41	1.33	1.13
Higher Secondary	51.97	52.38	41.57	38.89	4.49	6.08	1.12	1.59	0.84
Undergraduate	53.35	49.23	39.26	43.33	4.75	5.25	1.41	1.31	1.23
Postgraduate	58.69	75.92	30.99	19.59	7.04	3.27	1.88	0.82	1.41

Table 3 Students using the internet for educational purposes outside of the classroom

	Primary%	Secondary%	Higher Secondary%	Undergraduate%	Postgraduate%
Internet accessibility for students at home	60	70	65	85	95
Daily Internet use in %	95	78	46	53	67
Playing cooperative or single-player online games on a computer	50	68	60	40	34
Taking part in social networking	20	75	78	65	50
Internet conversation	30	54	80	71	45
Average life happiness as measured by online activity after school/college	80	64	40	28	30
Use of Internet throughout the weekends	85	78	62	68	56

Table 4 Attitudes of students when the internet is unavailable or malfunctions in the classroom

	Primary		Secondary		Higher Secondary		Undergraduate		Postgr
	agree%	disagree%	agree%	disagree%	agree%	disagree%	agree%	disagree%	agree%
Obtaining information from the Internet, by socio-economic status	90	10	84	16	78	22	71	29	64
Feeling bad if not connected to the Internet, by gender	95	5	86	14	84	16	87	13	78

Table 5 Using the Internet weekly in the classroom to boost student academic achievement in science

	Primary%	Secondary%	Higher Secondary%	Undergraduate%	Postgraduate%
Utilizing the Internet in institute to scale one's understanding of science	10	17	13	38	47
Low Internet users	6	8	5	6	6
Moderate Internet speed users	57	68	71	75	63
High Internet speed users	41	57	59	56	45
Extreme Internet speed users	9	10	12	18	25

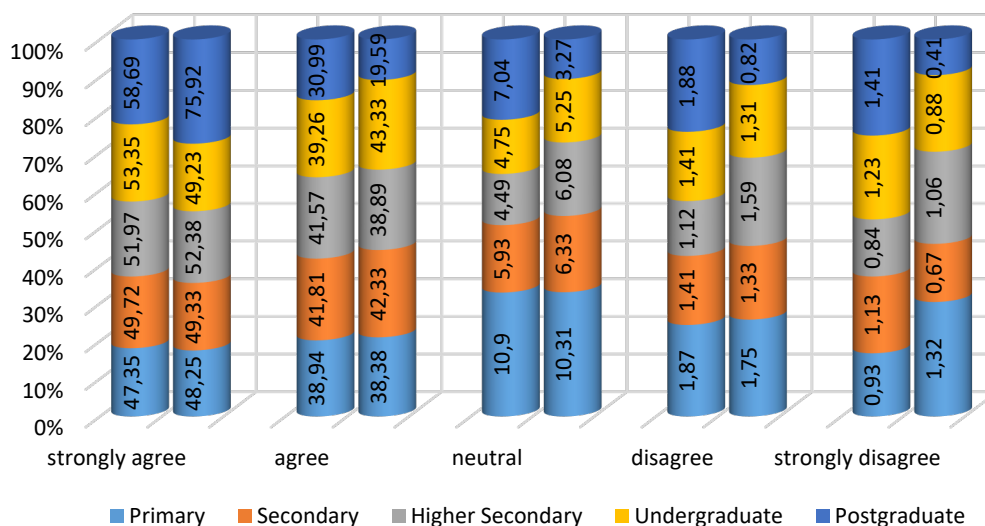


Fig. 3 Table 2's visualization methods demonstrate whether students utilize the Internet for academic reasons outside of the classroom.

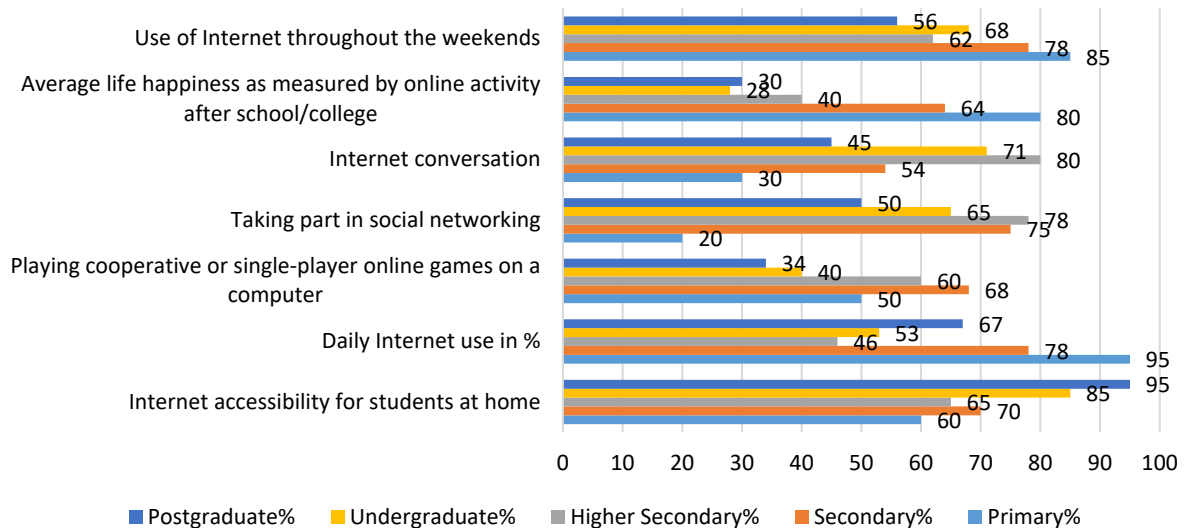


Fig. 4 Students' views are depicted graphically in Table 3 for data on how they feel when the internet is unavailable or malfunctioning outside of the classroom

Materials and Methods

An exploratory interview study served as the foundation for the questionnaire design. To particularly target the student population at the various educational levels involved in this research, several versions of the questionnaire were developed. In this section, we concentrated on the questionnaire's components that were developed especially for the students. The questionnaire was interactive, and based on a participant's responses to earlier questions, occasionally, new questions would be asked. As a result, some participants provided different or less information than others. Depending on the question, different percentages of people participated overall.

The following are the three main categories into which study questions may be separated. Next, we'll go through the questions on which they were based, the potential responses, and the steps we took to develop the metrics that were employed in the study.

- 1) *Information about your demographics.* Age, gender identification, and the name of the educational institution are examples of basic demographic questions.
- 2) *Social and personal issues.* The research made an effort to evaluate the students' personal and societal problems in considerable detail. We encouraged them to use words like "strongly agree," "agree," "neutral," "disagree," and "strongly disagree" in their responses so order to preserve their identities. Others selected "neutral," "disagree," or "definitely disagree," while several students selected to agree or strongly agree. Participants were only given questions specific to those elements if they had previously stated in the questionnaire that their challenges at the higher education level contained these characteristics.
- 3) *Participation.* We answered several of the student's queries inadvertently by avoiding direct communication. We asked this question personally rather than in public in order to safeguard the privacy of the students. This made it feasible for the student to respond truthfully and for our study to be as precise as possible. Many students were reluctant to provide answers to direct questions. He was reluctant to provide any personal information. We did not compel any student to respond. The student has the choice of responding to the questions or moving on to another set if he so chooses.

Data Analysis

Demographic data, social and personal issues, and the majority of the participation questionnaire's multidimensional questions comprised the Materials and Methods section. The participants, however, only received one-dimensional responses. The majority of the questionnaire's questions received responses from the participants.

Findings

Students from various levels at the institution responded to the surveys. This part evaluated the data gathered in relation to using technology outside or/and inside of the classroom for learning. In order to get at a firm conclusion, the recorded data were first subjected to make comparative analysis. Separate investigations and comparison studies with regard to the usage of electronic devices by the students for study purposes were carried

out in order to ensure accuracy, transparency, and confidence in the findings.

When questioned about using the internet for academic purposes, the majority of elementary, secondary, upper secondary, undergraduate, and postgraduate students said that they do so outside of class. The study discovered that primary and secondary students use the Internet for academic work outside of the classroom more frequently than other students. Compared to younger students, undergraduate and graduate students are less likely to conduct academic work outside of the classroom. The survey also revealed that students of all academic levels strongly support and agree with the use of the Internet for academic purposes outside of the classroom (Fig. 3 and Table 4).

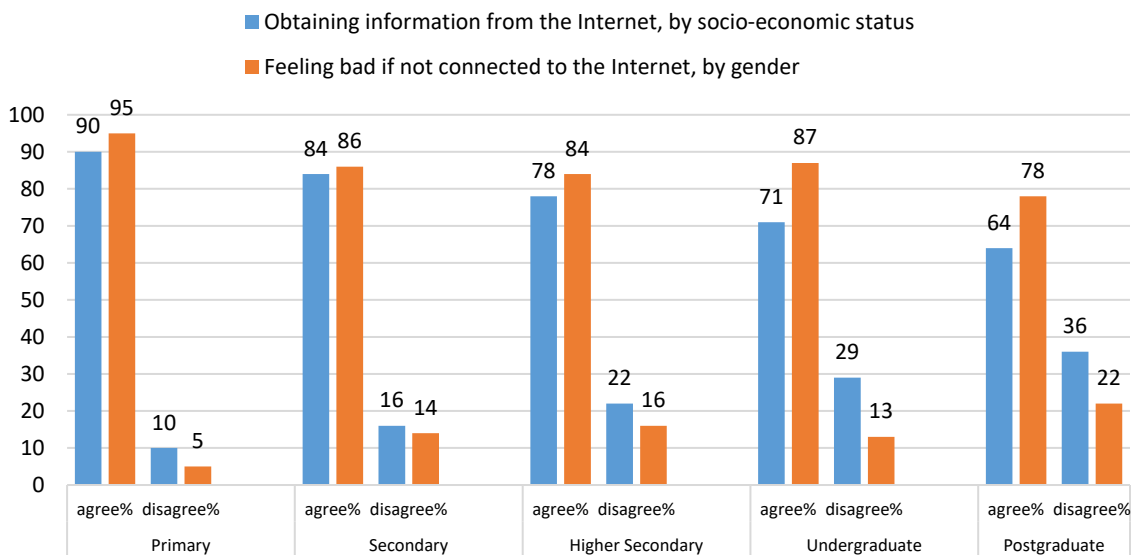


Fig. 5 Predictive analytics for Internet use by students for educational purposes outside of the classroom is shown in Table 3

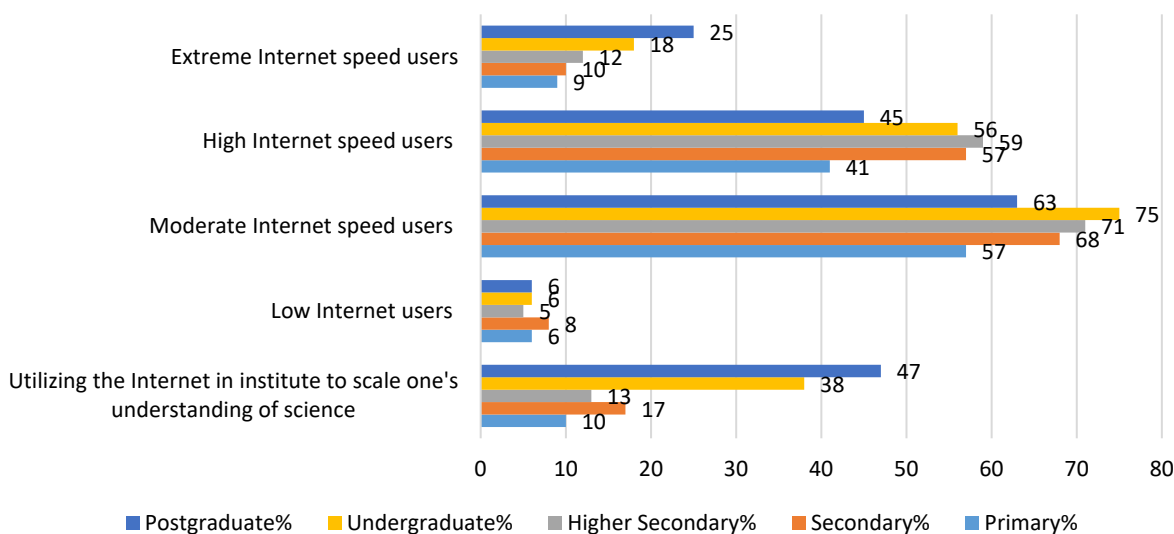


Fig. 6 Weekly internet usage in the classroom to improve scientific performance, visual analytics, Table 5. Data distribution in graphical form for Internet use by students for academic purposes both within and outside of the classroom

Fig. 4 illustrates how more postgraduate and undergraduate students than other students utilize the Internet on the weekends to do their academic work. In comparison to students at lower levels, undergraduate and graduate students are happier with online activities because they experiment with entertainment and have a deeper understanding of the game's complexities. Little children merely play online games for fun. The major reason why undergraduate and high school students utilize social networking sites more than other students are because their group circle is substantially broader. Also, young children do not view conversation as entertaining and, as a result, do not show much interest in it, but older students engage in meaningful conversation since they are more aware of right and wrong, which is tied to academics. Since they desire to use the Internet primarily for

amusement purposes exclusively, secondary and senior secondary students are more likely to have a liking for playing online games. Also, younger students use the internet at home less than other older students do since they are under more pressure to study from their parents. Undergraduate and graduate students use the internet more at home for academic work since there are fewer limitations from their parents (Table 3).

The predictive study of students using the Internet for academic study outside of the classroom is shown in Fig. 5 (Table 3). According to the survey, students of all grade levels were willing to utilize the Internet to learn more about their socioeconomic standing. Only a few students indicated their mobile internet access had been impacted when students of all levels were asked if it had. The majority of students chose "agree" or "disagree" equally when responding to this question. In other words, we can state that the majority of students receive twenty-four-hour service without interruption from internet access. Fig. 6 (Table 5) displays the responses to inquiries about internet speed using a bar chart. In our study, we discovered that the majority of students had mobile internet at a modest speed.

Discussion of the Results

We looked at a variety of academic works that were pertinent to this inquiry. After careful analysis, it was found that the advent of computers led to a considerable shift in society's functioning in addition to technological advancements. Man is viewed as a social animal that serves the community throughout his life. However, their way of life has undergone significant change since the development of computers and related technologies. The urge for people to use technology more frequently is having an impact on their mental health and contributing to an increase in mental diseases. Both the teaching and learning of many disciplines as well as the educational field may be significantly impacted.

The usage of technology gadgets has led to a rise in mental stress, which has a direct impact on academic achievement. In other words, mental tension has a subtle negative impact on reading that results in a loss of interest. The number of student dropouts has significantly grown in recent years. The COVID-19 epidemic and online learning, among other things, are mostly to blame for this.

Conclusion

ICT integration in education is the use of ICT by teachers to begin, reinforce, extend, develop, assess, and enhance students' knowledge of learning objectives. The notion that education should take place in or outside of the classroom is already being replaced by mobile technology. The "flipped classroom," in which students manage their own learning from home, has been adopted by certain academics. Virtual reality, iPads, and cloud computing may all affect education. A teaching method known as the "flipped classroom" puts an emphasis on teaching that is student-centered and application-based learning. Due of its success, proponents assert that the majority of students can do a full year's worth of work in a short period of time. Some claim that since students already spend too much time in front of screens, this will increase their usage.

Google hopes to eliminate barriers between instructors and students with G Suite for Education. Students can also get individualised assistance from Google's education partners. Making education more "targeted, adaptable, and real world centred" is the aim. More often than ever, cameras are being utilised to create academic material. Social media may be used effectively by both teachers and students in the classroom. According to Ofcom⁶, "one in three youngsters" had tablets at home, which increased the likelihood that they would get "video-homework" for GCSE topics.

Learning happens as a "side benefit" of this virtual acculturation process on Wikipedia, which is a digital cultural system. One may argue that an educational institution ought to have access to an online community's virtual area. A difficult application procedure to join the Wikipedia online community determines benefits. "A broad collection of technological tools and resources used to communicate as well as to produce, transport, store, and manage information," is how ICT is described. A wide number of devices are included in ICT, including computers, the internet, radio, television, and telephone.

Declaration

Conflict of interest They further declare that they have no conflict of interest.

Data availability The authors confirm that the data supporting the findings of this study are available within the article

⁶ <https://www.ofcom.org.uk/research-and-data/media-literacy-research/childrens/children-parents-oct-14>

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