10.48047/jocaaa.2024.33.08.270

AN INVESTIGATION ON THE ROLE OF STUDENT ETHICS AND DATA PRIVACY IN THE IMPLEMENTATION OF EDUCATIONAL TECHNOLOGY

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Abstract

This study was carried out with the purpose of investigating the privacy concerns and ethical considerations that are brought about by the use of technology in educational settings by both students and classroom instructors. This study was conducted to investigate these difficulties and analyse the relevance of their existence. In the context of educational institutions, the purpose of this study was to evaluate the ways in which social duties, such as the protection of student data, are tied to the utilisation of technology. The purpose of this study was to explore the policies and procedures that were already in place, with the objective of determining the extent to which they protect the anonymity of students and encourage ethical conduct in areas where instructional technology was used. This study was conducted to determine the most efficient strategies for ensuring that educational institutions use technology in a manner that is not only suitable but also secure. To achieve this aim, case studies and legal systems were investigated and analysed in great depth.

Keywords: *Ethics, Student privacy, Educational technology, Deployment*

Introduction

Within the framework of the utilisation of educational technology, the purpose of this study was to investigate the complex relationship that exists between student ethics and maintaining data privacy. The purpose of this study was to investigate how students' ethical conduct was influenced by contemporary technology, as well as the degree to which the privacy of student data was maintained in educational settings. This research aimed to give insights and

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prospective solutions that support the responsible and safe use of educational technology. In addition to building an atmosphere that encourages moral conduct and preserving the privacy of students, this study aims to propose viable solutions. To accomplish this goal, researchers were analysing the rules, regulations, and new concerns that are now in place. The modern period was characterised by significant breakthroughs in technology, and educational institutions all over the globe are increasingly depending on electronic resources and platforms to enhance the quality of education. Because of the increased use of technology in educational settings, there has been a considerable increase in the number of issues about the ethical behaviour of students and the security of their personal information. The protection of student data and the resolution of any ethical concerns that may emerge are two of the responsibilities that educators have when they use electronic devices to engage students and improve teaching methods. This was a result of the fact that educators need to make use of digital platforms to increase student engagement (Anderson, 2018).

Background Of the Study

Educational technology, sometimes known as EdTech, has been increasingly embraced by educators and administrators of schools in recent years as a method of simplifying processes and enhancing the learning outcomes of students. The use of educational technology comes with a multitude of benefits, two of which are the enhancement of productivity and the personalisation of learning. On the other hand, new technology does bring to light some significant concerns about privacy and ethics, which must be properly taken into consideration. As a consequence of the growing use of technology in educational settings, there has been a rise in the number of issues that are associated with the behaviour of students. There have been instances of plagiarism, cheating, and unauthorised use of web information, which are all examples of these difficulties (Kim et al., 2020). In addition to affecting the validity of

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academic accomplishments, these issues also affect the quality of the learning environment and the potential threat to the integrity of academic work. There are legitimate concerns about the privacy of student information as a result of the widespread collection, storage, and use of student data by educational technology platforms. In the context of the implementation of educational technology, it was of the utmost importance that all relevant parties, including legislators, have a comprehensive understanding of the complex link that exists between student ethics and maintaining data privacy. To overcome these challenges, it was necessary to conduct a thorough investigation of the rules, procedures, and ethical principles that now govern the incorporation of technology into educational settings (Brown, 2021)..

One of the most essential ethical considerations was to investigate the challenges that students have while attempting to navigate the online learning environment. These challenges include issues of honesty and integrity, as well as concerns about the inappropriate use of technology. a thorough investigation of the processes by which educational technology platforms collect, retain, and protect student data, with a particular focus on ensuring compliance with privacy laws and standards. The purpose of this study was to investigate the connection between student involvement, academic accomplishment, and the implementation of data privacy regulations. To ensure the confidentiality of student information and foster ethical conduct on the part of students, researchers provide the following guidelines and recommendations for the use of educational technology to teachers, educational institutions, and lawmakers. This study intends to give major new understandings and suggestions for increasing data privacy and ethical standards in educational technology. The emphasis of this research was on these characteristics, which are also the intended outcomes of the research. The purpose of this research was to provide a comprehensive digital learning environment that is reliable for each learner (Jones, 2019).

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Purpose of the Study

The purpose of this study was to analyse and assess the ethical implications and data privacy concerns that are associated with the usage of educational technology by students. The objective of this research is to evaluate the possibilities and challenges that are associated with the protection of student data and the development of moral conduct in educational technology settings. This was achieved by conducting a review of the policies and procedures that were already in place. The findings not only increased our understanding of the most effective methods, but they also had an impact on those methods, which inspired students to make responsible, secure, and confidential use of technology in the classroom.

Literature Review

In times past, educational establishments would conduct annual assessments of the percentage of students who graduated and those who continued their education. Teachers would assemble this information by using student grades and the conversation that took place in the classroom. Although the utilisation of data is not a unique idea, learning analytics is now seeing a surge in popularity as a consequence of many different topics coming together. Some of these topics include the amount of data that is being gathered, the capacity for storage, the processing power of institutions, the kinds of visualisation tools that are available, and the need for big data analysis and application. Learning analytics has become an indispensable instrument in the area of higher education as a result of the fact that "the quantification, measurement, comparison, and evaluation of the performance of institutions, staff, students, and the sector as a whole is intensifying and expanding rapidly" (Williamson et al., 2020).

A company headquartered in China, "learning analytics is the measurement, collection, analysis, and reporting of data about learners and their contexts, for understanding and

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enhancing learning and the environment in which it occurs." This particular interpretation of the statement is one of the most well-known occurrences of the term, and it is used rather often. In light of the growing need for learning analytics, educational institutions are required to set rules to guarantee that their classes are being delivered per the strategies that were developed. The most important things to keep an eye on are the things that count, such as being honest and creating trust, making practical use of data, ensuring access, and protecting privacy. About the implementation of learning analytics, the Data Quality Campaign has brought attention to these four policy themes, which are essential for institutions to consider. Data collection, data combining from numerous sources and pattern detection, data-driven decision making, interpretation of outcomes, and model update are all examples of the many broad processes that are involved in learning analytics. Learning analytics is a complicated process that incorporates several broad processes for example. Within the context of his research, Clow provides a graphical representation of the Learning Analytics Cycle concept. Once these broad criteria have been defined, businesses can adjust their operation methods (Etchells, 2019).

Research Objectives

i. To evaluate current practices and policies related to student ethics in the use of educational technology.

ii. To assess the effectiveness of existing measures in safeguarding student data privacy within educational technology deployments.

iii. To identify ethical challenges faced by students and educators when utilising digital tools and platforms in education.

iv. To propose recommendations for enhancing ethical behaviour and strengthening data privacy protections in educational technology environments.

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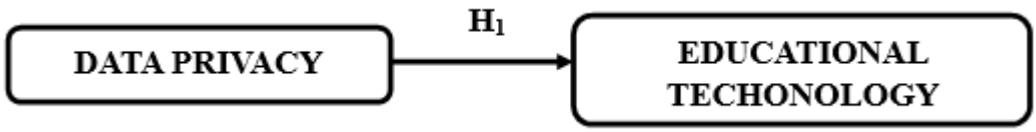
Research Methodology

The researcher used a quantitative technique due to the restricted time and resources available. After estimating a sample size of 1234 using Rao-soft software, 1400 questionnaires were sent out, 1356 were returned, and 31 were removed due to incomplete surveys. There were 1,325 participants in the research. All potential respondents were contacted for the survey via a random sampling method. While waiting for their educational equipment to be completed, students who opted to take part in the study were informed about it and had any queries answered by the researcher. In cases when a respondent could not read or write or was wheelchair-bound, the researcher would read aloud the survey questions and answer categories before taking their replies down on the form. People were asked to fill out and return surveys all at once in certain locations.

Conceptual Framework



Result

Factor Analysis:

Principal Components Analysis (PCA), a technique for minimizing the number of variables to be studied, identifies the subset of variables (components) that best describes the data. The following situation may be used to demonstrate this idea. Let's say the participant's resolution is measured by the researcher using a 25-item survey. By reducing the amount of questions, researchers seek to minimise the survey's duration. Simplifying the survey by identifying and removing duplicate questions using PCA is a smart idea. One of the questions may be removed

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if, for instance, questions 22 and 25 are somewhat similar (asking the same subject in slightly different ways). With the PCA approach, researchers may narrow down to the important questions or variables.

PCA is also known as exploratory factor analysis (EFA), which is another confusing term for exploratory factor analysis. The term "factor" is confusing and imprecise since the EFA researcher is more interested in components than in factors. Some software supports PCA as a kind of factor analysis.

Principal components analysis was a technique for minimising the number of variables to be taken into account, much like exploratory factor analysis. Essentially, this approach aims to reduce the number of artificial variables, or main components, that collectively account for most of the variance in the original independent variables from a large number of independent factors.

Typical PCA uses are as follows: The researcher may only want to include the variables (questions/statements) that they believe most closely represent the construct in the measurement scale if they have previously measured multiple variables and believe that some of these variables measure the same underlying construct (say, depression). Consequently, it was necessary to determine whether the construct being studied "loads" onto all or part of the variables.

This is helpful for two purposes: (a) determining whether a new measurement scale, such as a questionnaire, can be shortened to include fewer items, such as questions or statements; this was because there may be a better way to measure the construct of interest, or these items may be superfluous (i.e., multiple items may measure the same construct); (b) determining whether an existing measurement scale, such as a questionnaire, can be shortened (i.e., response rates tend to be higher in shorter questionnaires). The following list contains only a few instances of how often principal component analysis is used.

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One typical application of component Analysis (FA) was to confirm the latent component structure of a set of measured variables. Although they are not immediately quantifiable, latent factors were assumed to be the fundamental causes of observed scores on observable or indicator variables. FA was a model-dependent approach. The modelling of relationships between observables, unobservables, and error was its main objective.

The Kaiser-Meyer-Olkin (KMO) Test may be used to determine whether the data is appropriate for factor analysis. The test assesses the sample's representativeness overall and for each model variable. The possible common variance across data sets was measured by the statistics. A lower proportion suggests that factor analysis may be applied more easily to their data. Values between 0 and 1 are returned by KMO. A helpful guideline to bear in mind while analysing the statistic was that the sample is sufficient if the KMO values fall between 0.8 and 1, respectively.

• Corrective action must be taken immediately if the KMO values are less than 0.6, which suggests that the sample was inadequate. While some writers have proposed treating this number as 0.5, you should use their discretion to values that lie in the range of 0.5 and 0.6. According to some writers, this number ought to be interpreted as 0.5.

• KMO It is implied that there are a significant number of partial correlations compared to the overall number of correlations when the values are very near to zero. In other words, due to the nature of the question being asked, correlations are rather common, which poses a significant challenge for component analysis. Kaiser assigned the following values to the outcomes as a point of reference:

• Unacceptable from 0.00 to 0.49; awful from 0.50 to 0.59; mediocre from 0.60 to 0.69; moderate from 0.70 to 0.79.

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• Meritorious: 0.80 to 0.89; marvellous: 0.90 to 1.00. The first step in factor analysis was to determine if the data had the required characteristics. Not all data sets—especially those with little or nonexistent correlations between the variables—are appropriate for component analysis. The researcher will use the following standards to evaluate whether or not the data are suitable for factor analysis: The KMO and Bartlett of each independent variable. We take a broad view using the KMO and Bartlett test. When Bartlett's test significance threshold was less than 0.05 and the KMO value was more than 0.5, a strong association is evident. KMO measurements may also be calculated for every variable as an extra option. Values higher than 0.5 are acceptable.

Table: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.891
Bartlett's Test of Sphericity	**Approx. Chi-Square**	3252.968
	df	190
	Sig.	.000

The KMO value of the data used for this study is .891. Furthermore, Bartlett's test of Sphericity derived the significance level as 0.00. Hence, the sample was proven suitable for running factor analysis. After performing EFA, four factors were extracted and the eigenvalues of these factors were 34.13, 1.687, 1.225 and 1.217, respectively. Since all the values were greater than 1, it refers to the consistency of clustering. In addition, it was observed that the first four factors together explained 68.45% of the total variance. Furthermore, the factor loadings of all the items were either equal to or greater than 0.5.

Test for Hypothesis

Educational Technology Deployments

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In the context of education, the term "educational technology deployment" refers to the utilisation of digital tools, resources, and platforms to enhance the teaching and learning process. This encompasses a broad range of applications and software programs that are intended to assist with a variety of tasks within the realm of education, ranging from classroom instruction to administrative tasks. usage of online resources, software, and applications that have been developed with education in mind, such as learning management systems (LMS), interactive whiteboards, virtual classrooms, and educational apps. To assist with administrative and instructional responsibilities, hardware integration was used. Examples of hardware integration include laptops, tablets, interactive displays, and virtual reality (VR) gear. Enhancing the delivery of the curriculum and encouraging students to participate in a wide range of learning activities may be accomplished via the use of interactive learning tools, digital material, and multimedia. providing teachers with ongoing guidance and chances for professional development to assist them in properly incorporating and using educational technology into their lesson plans (Fenech, 2020).

Data Privacy

Providing individuals with the ability to exercise control over their data and protecting their personal information are the two primary objectives of having data privacy. As part of this, it was necessary to adhere to the legal requirements, safeguard data against misuse and unauthorised access, and maintain transparency and honesty on the utilisation of data. Obtaining consent, securing data via encryption and other security techniques, maintaining people's rights to see and control their data, and just collecting the least amount of data that is necessary were all important issues to take into account. A few of the advantages that come with having efficient data privacy processes are the establishment of confidence and the guarantee of responsible use of personal information (Giordmaina, 2019).

Relation between Educational Technology Deployments and Data Privacy

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The handling of significant amounts of personal data that were often linked with the use of educational technology raises concerns regarding the protection of individuals' privacy. Institutions are required to get consent from users, responsibly handle data, appropriately protect data, and comply with relevant regulations to guarantee the privacy of users' data. To protect personal information and preserve confidence, it was essential to find a middle ground between the advantages offered by contemporary technology and stringent privacy and data protection regulations (Lauri, 2020).

Based on the above discussion, the researcher formulated the following hypothesis, which analysed the relationship between Educational Technology Deployments and Data Privacy.

H_{01}: There is no significant relationship between Educational Technology Deployments and Data Privacy.

H_1: There is a significant relationship between Educational Technology Deployments and Data Privacy.

Table: H_1 ANOVA

ANOVA					
Sum					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	39588.620	819	5655.517	1115.623	.000
Within Groups	492.770	505	5.356		
Total	40081.390	1324			

In this study, the result is significant. The value of F is 1115.623, which reaches significance with a p-value of .000 (which is less than the .05 alpha level). This means the ***"H1: There is a significant relationship between Educational Technology Deployments and Data Privacy"*** is accepted and the null hypothesis is rejected.

Discussion

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Technology in the classroom has revolutionised education, but it had also brought up serious concerns about student privacy and ethics. Schools must comprehend the effects of digital tools on student behaviour and data management as they include new technology in their operations. The rules that govern students' behaviour in educational environments were known as student ethics, and they stress the need to be truthful, have integrity, and respect others. As they work on group projects, participate in online debates, and use a variety of digital tools, students must remember to act ethically in a technology-driven world. Students create a supportive learning environment by acting ethically, which in turn encourages their classmates to trust and work together. Another major issue with educational technology was data privacy. Concerns about data security, illegal access, and possible abuse have grown in importance due to the growing acquisition of personal data via digital platforms. The confidentiality of student information is of the utmost importance for some reasons, including the need to adhere to laws like FERPA and the need to keep the faith of parents, students, and schools. Everyone involved from teachers to parents and students had a right to know what information was being gathered and by whom. When it comes to instructional technology, the delicate balance between student ethics and data protection is crucial. Student engagement with these technologies is likely to be good when they were aware of their ethical duties related to data sharing. Their learning experiences are enhanced and a culture of accountability was built via this interaction. Also, when schools emphasize data privacy, they make kids feel protected, which boosts their engagement and motivation in class. Nevertheless, this setting might provide several difficulties. Unintentional invasions of privacy may occur because many students may not understand the moral weight of their online activities. Furthermore, schools could encounter opposition while trying to use new technology, especially if there is doubt about how data was handled. Educators and students alike may benefit from training on data privacy and ethical technology usage if schools are serious about addressing these issues. A culture of

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responsibility and well-defined rules may go a long way towards keeping everyone in the loop. Going forward, with the rapid evolution of technology, there was an ever-increasing need for ongoing education about data privacy and ethics. To help children develop a feeling of agency and control over their online personas, schools should facilitate conversations about these topics. Educational institutions may improve the integration of technology in classrooms by placing a premium on ethical conduct and data security. This eventually resulted in safer, more engaging learning environments for all students. In conclusion, it was essential to consider student ethics and data privacy while using instructional technology. By giving careful consideration to these factors, educational institutions may establish a climate that promotes innovation while also protecting students' rights and welfare.

Conclusion

Finally, when it comes to the use of educational technology, there was a complex but essential connection between the confidentiality of student data and the ethics of students. Given the increasing reliance that educational institutions are placing on digital tools to enhance learning, it is of the utmost importance to establish a strong sense of ethics in each student. This paradigm not only helps students conduct themselves appropriately in the digital world, but it also fosters an environment in the classroom that was courteous and honest. It was of the highest significance to ensure that the information on students is kept secure and private. They were more inclined to adopt educational technology when they had trust that their data was handled with respect and transparency. This includes both students and parents. It was ultimately the case that this form of engagement enhances education and provides students with the resources they need to be successful in the digital economy of today. However, the road to effective implementation is not devoid of challenges along the way. Because of the potential for growth to be hampered by a lack of awareness of ethical commitments and data privacy, educational institutions need to place a strong focus on continual education and open communication. One

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of the most effective ways for educational institutions to foster a sense of responsibility was by ensuring that both instructors and students have access to the resources necessary for their success. Going forward, it was very necessary to adopt a proactive attitude on data privacy and ethics. Not only does this ensure that children are responsible members of the digital community, but it also prepares them for the academic and professional endeavours that they will partake in in the future. When this is done, schools would be able to offer children secure environments in which they can study, while also harnessing the advantages of technology without compromising the children's rights or threats to their safety. Within the context of an environment that is becoming more digital, the future of education was constructed on a strong foundation of ethical norms and data security requirements.

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