Proposal of the inverted classroom model as a teaching strategy to educate tenth grade students on the subject of data protection

Yolanda de la Nube Cruz Gavilánez[1], Tania Magdalena Cruz Gavilanes[2], William Gabriel Escobar Cordero[3], María Virginia Quizhpi López[4], Greiz del Rocío Sacoto Encalada[5], Diana Carolina Campoverde Guallpa[6], Margarita Marivel Sacoto Encalada[7]

1 nube5502@gmail.com, Universidad Internacional de la Rioja, https://orcid.org/0000-0002-8844-9958
2 tmcruzg@ucacue.edu.ec, Universidad Católica de Cuenca, https://orcid.org/0000-0001-6126-4868
3 willyjose_89@hotmail.com, Royal Military Academy Brussels, BE, https://orcid.org/0009-0009-7872-0247
4 maria.quizhpi@unmsm.edu.pe, Universidad Nacional Mayor de San Marcos, https://orcid.org/0000-0003-1680-9990
5 grse3@hotmail.com, Unidad Educativa José Peralta, Centro Académico Dr. Luis Fernando Quizhpi Santander
https://orcid.org/0009-0001-1156-9265
6 dcampoverde54@yahoo.com, Unidad Educativa José Peralta,https://orcid.org/0009-0005-5226-0490
7 marysacoto70@gmail.com, Unidad Educativa Ezequiel Cárdenas Espinoza, https://orcid.org/0009-0001-6542-8222

Abstract

The present study investigates the effectiveness of implementing the Flipped Classroom Model as a teaching strategy to address the topic of data protection with tenth-grade students. Data protection has become a crucial issue in the digital age, and it is essential for students to understand the principles and practices associated with it. The Flipped Classroom Model involves flipping the traditional teaching structure, where students acquire prior knowledge outside the classroom through multimedia materials, and then engage in active learning activities during class time. An experimental study was conducted on a sample of tenth-grade students, comparing the effectiveness of the Flipped Classroom Model with traditional teaching methods. The results revealed that implementing the Flipped Classroom Model significantly improved understanding and retention of concepts related to data protection compared to traditional teaching methods. This study demonstrates the potential of the Flipped Classroom Model as an effective strategy for educating students about complex topics such as data protection in the digital age.

Key Words: Flipped Classroom, training, Data Protection, students, Tenth grade of elementary education

1. INTRODUCTION

Currently, the progressive incorporation of our society to the digital world has generated an increase in interest and concern about the online exposure of users. This interest has expanded mainly in the educational field, where personal data of underage students is handled, making them vulnerable to malicious or psychologically challenged individuals(Chango, 2018) (Vence, 2023). However, it is crucial to

highlight that digital globalization has brought countless benefits, especially in the educational sphere. The network has become a fundamental resource for children and young people in educational institutions, as it accelerates the teaching-learning processes. In this context, students resort to a wide range of technological tools and digital platforms in order to enhance their educational experience (Borregán & Nuria, 2021) (Torres G, 2013).

It is relevant to highlight that, in this digital era, there has been a complete transformation in the way teaching is taught, in the methods of teaching classes and in the role of teachers (Torres G, 2013). The increase in the use of technologies has generated an abundance of user data, especially of children and adolescents in educational environments, in a variety of digital tools and social networks. It is important to note that large technology companies exert considerable influence on the behavior of minors, directing their attention to certain tools, applications and social networking platforms, resulting in the collection of student data (Rivera & Vargas, 2022)

The remarkable increase of users with access to the Internet worldwide (Chango, 2018), was remarkable, especially during the recent pandemic. This event triggered a series of changes and decisions in the technological field, leading us towards the continuity of the educational system through digital media (Rivera & Vargas, 2022). This increase highlighted the urgency of establishing clear privacy and data protection policies for both students and all users interacting on the network (Vence, 2023).

In this situation, it is essential that students have security measures and safeguards in place when using digital devices, applications and social networking platforms (Herrero et al., 2022). In fact, the lack of effective data protection policies could pose significant challenges in the management of personal information shared online. Therefore, students should be aware of the importance of appropriate and responsible use of digital technology to prevent cyberbullying situations (Chango, 2018).

Nowadays, the tendency to share personal activities, relationships, criticisms and opinions on social networks and the Internet has crossed boundaries, especially among school-age users. This practice is shown when students, teachers and parents use specific digital applications to share information and educational activities. Unfortunately, however, this behavior has led to the violation of fundamental rights such as the right to privacy, image and the right to data protection of students on numerous occasions (Hunt, 2016) (Martín, 2018).

The Flipped Classroom model offers a new opportunity to address the lack of awareness about personal data protection, aligning with various legal provisions that underline the importance of privacy and information security. The Law on Personal Data Protection and Guarantee of Digital Rights in Spain, established in Article 5 of Organic Law 3/2018, requires educational institutions to adopt measures to ensure the confidentiality and security of students' personal data (Agencia Española , 2018). By incorporating this educational model, teachers can dedicate time in class to assist students to these legal principles, fostering a culture of cybersecurity and respect towards privacy from an early age. Also, the General Data Protection Regulation (GDPR) of the European Union, in its article 24, urges organizations to take proactive measures to protect personal data (Parlamento Europeo, 2016). From the Flipped Classroom methodology, schools can use digital resources to teach about these articles of law, fostering greater awareness and responsibility in the handling of digital information.

The main objective of this research, according to the Flipped Classroom approach, is to educate students about the importance of protecting their personal data in a digital environment. This educational method aims to make students aware of the importance of protecting their personal data while interacting, communicating, sharing and publishing their personal data in the various social networks and digital applications that exist today.

The objective of this method is for students to acquire basic knowledge prior to face-to-face classes, which will allow them to participate more actively and thoughtfully in the classroom. They will be able to participate in hands-on activities, answer questions and understand safe online practices.

2. METHODOLOGY

The current educational system has undergone great changes with the more acute use of information and communication technologies (ICT). Students today seek lightness and immediate answers on the topics they are dealing with, in addition to acquiring collaborative work and personalized learning (Graells, 2008) (Hernandez, 2017). That is why in this proposal several methods have been selected that are closer to what we want to promote in the new education and the objectives that we want to obtain in the teaching-learning process. Within the method that is implemented in the classroom, students can adapt and learn new skills with the incorporation of ICT. The Flipped Classroom model emerges as a valuable and effective tool in education. This methodology allows students to explore previous concepts from home, using digital resources. This represents a significant change from the traditional teaching approach, freeing up classroom time for more hands-on and interactive learning activities. In addition, the Flipped Classroom provides a new opportunity to address the lack of awareness around personal data protection (Plaza Ponte & Maliza Muñoz, 2021). Instead of simply transmitting information, teachers can use class time to encourage discussions about cybersecurity, promoting student awareness of cyberbullying, sexual harassment, and online extortion. In this way, a more dynamic and relevant learning is promoted, empowering students to face digital challenges in an informed and responsible manner (Herrera S & Prendes E, 2019).

The primary objective of the research is to develop an innovative proposal that implements the Flipped Classroom method as a pedagogical strategy to instruct students in tenth grade of basic education, on the knowledge and application of Data Protection in digital environments aligned with various legal provisions. In order to meet the outlined goal, the following points are ensured:

Design educational materials adapted to the Flipped Classroom model that address key concepts on Data Protection in digital environments aligned with various legal provisions, specifically aimed at tenth grade students in the elective subject.

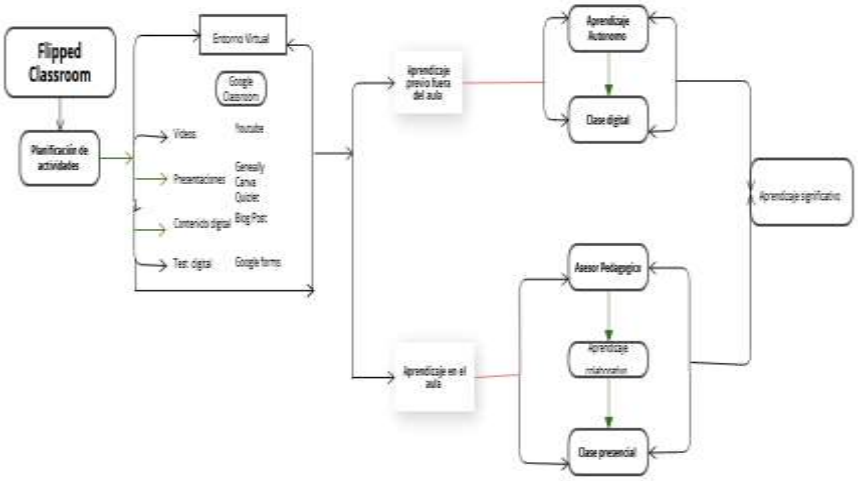
Create interactive activities and contextualized assignments within the Flipped Classroom approach that foster students' in-depth understanding of risks and safety measures in handling online data.

Establish a digital platform or virtual environment accessible to students, where they can access previous educational content and relevant resources related to Data Protection and legal provisions, thus facilitating preparation prior to face-to-face classes.

Periodically evaluate students' progress in the understanding and application of Data Protection practices and legal provisions through the Flipped Classroom methodology, in order to continuously adjust and improve the educational proposal.

Figure 1 illustrates the key role that the methodology will play in the proposal presented in this document.

Figure 1. Flipped classroom methodology



Source: Own elaboration

3. PROPOSAL

Stages of the proposal

The proposal presented includes seven sessions planned for implementation. In the table of activities, the content of each session will be thoroughly detailed, using a thorough explanation supported by ICT tools and in line with the Inverted Classroom method, also known as Flipped Classroom. Each session will address a topic related to data protection on the web, with a specific objective, the development of the corresponding activity, the resources used and the estimated duration of each activity. This methodology is characterized by its sequential approach in the learning process, which includes the following stages: prior learning, individual learning, group learning and classroom learning.

Prior Learning

As a starting point, students will engage in prior learning activities at home. This involves watching videos and reviewing theoretical materials to understand the subject matter intended for tenth grade adolescents. This approach focuses on individual learning, where students are encouraged to ask the instructor questions about the previously studied topic. The instructor is responsible for providing feedback on the material presented and proceeding with group instruction on the next topic.

Individual Learning

During this phase, each student works autonomously to absorb the content provided in the previous materials. Students are expected to watch the videos, read the assigned texts and take notes on points they consider important or that generate doubts. This stage is crucial, as it allows students to internalize concepts at their own pace, encouraging self-education and self-management of learning.

Group Learning

In the classroom, the facilitator plays the role of guide in the teaching-learning process, forming working groups to carry out the proposed activities. This allows students to develop skills in a collaborative environment, where they can discuss, debate and solve problems together. Group activities are designed to encourage interaction and the exchange of ideas, essential for the development of a deeper and more applicable understanding of the topics covered.

Classroom Learning

As a culminating point, group activities are included and will be assessed by the instructor, who will provide feedback and assign grades based on the effectiveness of the performance and elaboration of tasks assigned in the sessions. It is important to note that the use of rubrics will be constant in each session, ensuring an objective and consistent evaluation. Students will present the assigned activities through presentations, which will allow the facilitator to foster learning in the classroom, reinforcing and consolidating the topics addressed.

Contextualization of the Students

Before starting the activities planned with the Flipped Classroom model for the teaching-learning process on online data protection, aimed at tenth grade students, a group presentation will be carried out. In this session, the innovative project, its structure and the work methodology to be used will be detailed. The link to the virtual classroom dedicated to Data Protection in digital environments will be provided, where all the resources and materials necessary for students to carry out their self-education at home, following the Flipped Classroom model in practice, will be hosted.

After having explained, applied and understood the functioning of the Flipped Classroom model for teaching data protection, an instance for questions will be opened in order to clarify any doubts that may arise at that moment.

Next, we will conduct a tour of the Classroom platform. During the tour, we will showcase the proposed activities for teaching and learning about data protection using the Flipped Classroom model. This tour will ensure that all students have access to the platform, which will host activities designed for both home and classroom use, in line with the proposed methodology.

Next, some examples of activities corresponding to the sessions intended to address the learning of data protection and legal provisions are presented in the tables. The examples detail the specific objectives, the development of the activities, the necessary resources, and the estimated duration of each one, ensuring an effective and coherent implementation of the Flipped Classroom model in the context of personal data protection.

Table 1: Session 1 of the Flipped Classroom Model Proposal

Subject: Introduction to User Data Protection in Digital Environments.		
Objective: Provide information and a solid understanding of data protection and privacy concepts in the digital environment, applying these concepts to real life.		
Key competencies: Develop the ability to understand, apply, and communicate basic ideas about data protection in the contemporary digital environment.		
Activity	**Learning**	**Description**
Activity at Home: 1. Students will access Classroom and locate the first task	Pre-class learning	The teacher selects intentional content to help students understand data protection. The videos selected for this activity are: https://www.youtube.com/watch?v=bg8atmhcuSU (gobierno de Navarra, 2021) https://www.youtube.com/watch?v=ek834DyWXh8 (infocdmex, 2021)

2. They will watch two videos on data protection introduction (60 minutes).		**Figure 2.** Session 1 Visualization.  **Source:** Created by me on classroom.
	Individual learning	After watching the videos, students are expected to understand the topic that will be discussed in the classroom. They are supposed to write a summary of what they observed and list the points that they do not understand clearly. This stage promotes low-level thinking, as it focuses on understanding and recognition.
Classroom Activity The teacher will facilitate a 90-minute debate among students on the previously reviewed topic while addressing any questions or concerns they may have.	Classroom Learning	This phase promotes high-level thinking, as students create, evaluate, analyze, and apply concepts to real situations. Active teaching strategies are employed, such as the Flipped Classroom (FC) methodology, which encourages active student participation, promoting autonomous, collaborative, cooperative, and dialogic learning.
	Group Learning	The teacher will manage and energize the group of students through activities in pairs, small groups, or the whole class simultaneously or sequentially. These activities are designed to maintain coherence and clarity of the topic, ensuring that students do not lose interest
TIC Resources Used: Classroom, Internet, Popplet, Canva.		
Assessment: Students will demonstrate their learning by answering questions and creating mind maps. The assessment is broken down as follows: - 4 points for the digital submission of the assigned activity. - An additional 2 points if the submission is made on time. - 4 points for the quality and accuracy of the final product produced.		

Source: Own elaboration

In the next session, the class will cover the importance of understanding Ecuador's data protection law.

Table 2. Sesión 2

Subject: Data Protection Aligning with Various Legal Provisions
Objective: To provide a solid understanding of laws and regulations related to data protection and how to apply them in the digital environment

<table>
<tr><td colspan="3">Key Competencies: Developing the ability to interpret, apply, and communicate knowledge about legal data protection provisions in digital contexts</td></tr>
<tr><td>Activity</td><td>Learning</td><td>Description:</td></tr>
<tr><td rowspan="2">At-home activity</td><td>Pre-class learning</td><td>Students will log in to Classroom and identify the second activity. They will watch videos and read articles about legal provisions related to data protection (60 minutes). The teacher will select relevant and current content for the students to understand data protection laws.

Selected Videos and Articles:

Video 1: https://www.youtube.com/watch?v=x_Hs__KO2p4 (GlobalSuite Solutions, 2021)
https://www.pwc.ec/es/entrevistas-de-temas-de-interes/ley-de-proteccion-de-datos-personales.html (Ramón & MariaJ, 2022)
Figure 3. Session 2 Visualization.
 

Source: Created by me on classroom</td></tr>
<tr><td>Individual Learning:</td><td>After watching the videos and reading the articles, students should understand the legal provisions that will be discussed in the classroom. They are expected to summarize what they have observed and read, and list the points that they do not understand clearly. This stage promotes low-level thinking, centered on comprehension and recognition.</td></tr>
<tr><td rowspan="2">Actividad en el aula</td><td>Classroom Learning:</td><td>After watching the videos and reading the articles, students should comprehend the legal provisions that will be discussed in the classroom. They are expected to summarize what they have observed and read, and list the points that they do not understand clearly. This stage promotes low-level thinking, centered on comprehension and recognition.</td></tr>
<tr><td>Group Learning</td><td>The teacher will manage and energize the group of students through activities in pairs, small groups, or involving the entire class simultaneously or sequentially. These activities are designed to maintain the coherence and clarity of the topic, ensuring that students do not lose interest.</td></tr>
</table>

TIC Resources used: Classroom, Internet, Popplet, Canva
Assessment: Students will demonstrate their learning by answering questions and creating mind maps about legal provisions. The assessment breakdown is as follows: - 4 points for the digital submission of the assigned activity. - 2 additional points for submitting on time. - 4 points for the quality and accuracy of the final product.

Source: Own elaboration

It is important to note that all sessions planned for teaching data protection are supported by detailed assessment criteria in the relevant assessment sections and in the description of each session. Additionally, the satisfactory completion of all assigned tasks will contribute to the analysis of the proper use of concepts and online data. This will allow for the consolidation of acquired knowledge and provide precise feedback to the students. The following are the instruments used in the proposal:

Observation of Work at Home and in the Classroom. This involves observing the work done at home and its complement in the classroom, where students participate using the prior knowledge provided by the teacher before each class. This preparation allows students to come to the classroom with a wealth of information, fostering a more dynamic and participative class environment and greater student involvement. Additionally, the students' commitment to improving the teaching process is evident in the completion of tasks assigned at the end of each session.

Questionnaires: The questionnaires will play a fundamental role in carrying out activities that require reading, observation, and listening. At the end of the proposal, a questionnaire will be provided for students to evaluate both the work done and their perception of the methodology used in the data protection learning process. The corresponding form is available at the following link, along with a screenshot showing its structure and operation.

These assessment tools not only measure student progress but also continuously adjust and improve the methodology, ensuring an effective teaching and learning process tailored to students' needs..

Figure 4. Visualization Self-assessment

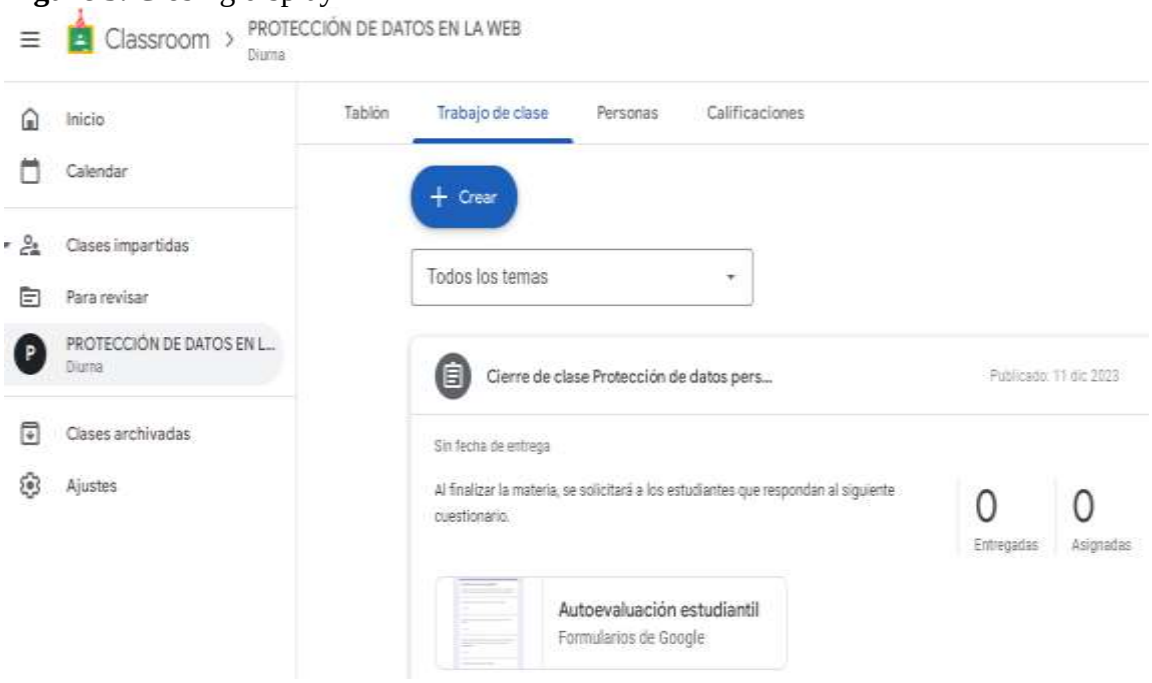
Source: Created by me on classroom

The teacher will provide individual feedback to the students on their assignments, including corrections and comments specific to each submission. The feedback will also include the assigned score based on the punctuality, quality, and coherence of the work.

Regarding the group evaluation, both individual and teamwork have been encouraged throughout all activities. When forming groups, each member has had the opportunity to share their knowledge, participate in discussions, create videos, mind maps, and reflections. At the end, the students are free to reflect on the positive and negative aspects of the proposed method in the project through satisfaction surveys, group discussions, or self and peer assessments.

For the closure, a final questionnaire will be conducted. After completing the activities and the teaching-learning process, the students will perform a self-assessment through a form that will consider the impacts of the implementation of this proposal on the performance in the data protection subject.

Figure 5. Closing display



Source: Created by me on classroom

4. CONCLUSIÓNS

The proposal sets out to tackle a pressing issue found across all educational institutions: the lack of education on safeguarding personal data online. Tenth-grade students are often uninformed about the criticality of protecting their personal information in the digital realm. Through this innovative approach, we aim to enhance students' conduct in the digital sphere. It's crucial to acknowledge that this problem may be prevalent in other educational environments.

Introducing the Flipped Classroom method as a pedagogical strategy is seen as a groundbreaking and impactful initiative to guide tenth-grade students in the optional subject of data protection in digital environments. This model presents a distinct opportunity to actively involve students in their own learning process.

The development of educational materials tailored to the Flipped Classroom model and focused on addressing key concepts related to data protection has been crucial. These materials are designed to meet the needs and comprehension levels of tenth-grade students, confirming the importance and effectiveness of this innovative approach.

The implementation of this proposal enables the execution of participative activities and tasks tailored to the Flipped Classroom approach, which promotes a deeper understanding of the risks and security measures in handling data in digital environments. The proposed

activities aim to encourage the practical application of the acquired concepts, allowing students to effectively apply what they have learned.

The creation of a digital platform or accessible virtual environment is identified as a fundamental key to facilitate access to previous educational content and relevant resources on data protection. This approach provides students with the opportunity to effectively prepare before in-person classes.

The development of this proposal has opened up a wide range of useful technological tools (ICT) for both the teacher, in terms of assignment, submission, collection, and analysis of tasks and information, and for the student, who will be able to efficiently carry out the assigned activities.

Constant evaluation of students' progress in understanding and applying data protection practices using the Flipped Classroom methodology reflects a continuous commitment to improving and adjusting the educational proposal. Ongoing feedback allows for adapting teaching to the established needs and challenges.

The objectives outlined in the proposal converge in creating a comprehensive and priority educational experience for the student, benefiting from the advantages of the Flipped Classroom model to effectively address the issue of data protection in digital environments in the institution's middle school education.

It is essential to emphasize that this is a valuable methodology that will contribute to the teaching process in data protection and will provide an opportunity for teachers, tutors, and school authorities to recognize the importance of educating students on these issues. This is because students are exposed to risks when sharing information. It is crucial to show the evolution, transformation, and active dynamics of the student in the teaching process with the implementation of this methodology.

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