Open Educational Resources to Enhance Students' Data Protection in Schools

Recursos Educativos Abiertos para mejorar la protección de datos de los estudiantes en las escuelas

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Abstract- In today's digital age, schools are turning to third-party software that relies on cloud computing. This shift presents unique challenges, problems and concerns related to privacy and security of students' data. The SPADATAS project aims to promote responsible use of digital technologies and to improve data protection in data academic management practices within educational settings. As an output of the project, we aim to help address concerns related to data privacy and security in schools, particularly related to academic data treatment processes. To raise awareness and enhance data protection at schools, we conducted a comprehensive search of relevant online and open resources. This work presents the methodology used to find the resources and a mapping of the results. While an abundance of resources exists for schools, a meticulous analysis is indispensable to discern which are most effective in enhancing data protection.

Keywords: data fragility, student privacy, academic data management, educational technology, cloud computing.

Resumen- Las escuelas están recurriendo a software de terceros que se ejecuta en la nube. Este cambio presenta desafíos, problemas y preocupaciones únicas relacionadas con la privacidad y la seguridad de los datos de los estudiantes. El proyecto SPADATAS promueve el uso responsable de las tecnologías digitales y mejorar la protección de datos en las prácticas de gestión de datos académicos dentro de los entornos educativos. Uno de nuestros objetivos es abordar esas preocupaciones sobre privacidad y seguridad de datos, particularmente en los procesos de tratamiento de datos académicos. Para aumentar la conciencia y mejorar la protección de datos en las escuelas, realizamos una búsqueda exhaustiva de recursos en línea y abiertos relevantes. Este trabajo presenta la metodología utilizada y los resultados. Existe una gran cantidad de recursos para las escuelas, pero se requiere un análisis meticuloso para discernir cuáles son los más efectivos para mejorar la protección de datos.

Palabras clave: fragilidad de datos, privacidad de estudiantes, gestión de datos académicos. tecnología educativa, computación en la nube.

1. INTRODUCTION

In today's digital age, schools and universities are turning to third-party software that relies heavily on cloud computing (García-Peñalvo et al., 2015). While this shift brings numerous benefits, such as reduced costs and increased efficiency, it also presents unique challenges and concerns related to the privacy

and security of students' data (Amo et al., 2020). In particular, the abundant collection, storage, processing, and analysis of student data in the cloud create potential issues around data misuse, leakage, and loss of control by both educators and students themselves (Amo et al., 2021).

To address issues abovementioned, the European Union has identified enhancing digital skills and data literacy among its citizens as a key priority (de Torres & Canaleta, 2023). In the education environment, data introduced in educational technology (edtech) is usually transferred to other countries and continents (Amo-Filvà et al., 2022). Such scenario adds additional concerns and problems regarding data privacy and security in data academic management at schools. Hence, there is an urgent need to address such concerns and problems to protect identity, or at least raise awareness of the importance of protection data of students.

The SPADATAS project (Amo-Filva et al., 2023) aims to promote responsible use of digital technologies and improve data management practices within educational settings. By providing resources, teacher training, and public sharing of best practices, the project seeks to empower educators and students with the knowledge and confidence needed to navigate the complex world of data fragility while harnessing the full benefits of EdTech. Ultimately, promoting data protection and fostering an ethical approach to data usage will enable educational organizations to maximize the positive impact of digital transformation. Details of SPADATAS project are summarized in Table 1.

TABLE I.   SPADATAS DETALS

Title	Security and Privacy in Academic Data management at Schools - SPADATAS
Funding Entity	European Union
Call	Erasmus + KA2 - Cooperation partnership in school education
Reference	2022-1-ES01-KA220-SCH-000086363
Project leader	Daniel Amo
Coordinator	La Salle CampusBCN, Ramon Llull University
Partners	- Salamanca University, Spain - Juraj Dobrila University of Pula, Croatia - University of Maribor, Slovenia - University of Southern Denmark, Denmark - Oerestad Gymnasium, Denmark l. osnovna skola Cakovec, Croatia
Budget	250.000 €
Date	01/10/2022 to 31/03/2025
Web	https://spadatas.eu/

As an output of the SPADATAS project intended to help address the issues aforementioned, we conducted a comprehensive search of relevant online resources, compiling a dataset of websites, video recordings, documents, case studies, reports, and policy briefs. By analyzing and mapping these resources, we aimed to generate a collection of open and educational resources to help enhance data protection practices within the education industry.

The paper is structured in four distinct sections. The opening portion serves as an introduction, outlining the purpose and scope of the investigation. Following this initial segment, a second component presents the context and exposition of the methodology employed throughout the inquiry. Subsequently, the third division illuminates the results generated from our exploration. Lastly, the final part concludes the paper by summarizing the crucial inferences drawn from the results and highlighting the implications of these observations for future endeavors.

2.   CONTEXT & DESCRIPTION

This work collects and analyze relevant online and open resources (OER)[1] such as guides, checklists, toolkits, templates webinars, websites, articles, blogs, and reports discussing critical perspectives on data protection practices in schools from any part of the world. The selected materials can help stakeholders to 1) understand the significance of safeguarding confidential student data, 2) know which laws affect teaching and learning practices, and 3) provide recommendations for strengthened data protections in schools. These include valuable insights into data management policies, best practices, tools, and regulations, supporting individuals in their quest for improved data protection. Hence, the collected sources serve as a foundation for 1) identifying common themes, gaps, or discrepancies and 2) helping enhance data protection in existing educational practices where treatment of student data is involved.

By sharing the search results to stakeholders, such as principals and teachers, we aim to contribute to the development of strategies for bolstering the defense of student data privacy across diverse educational systems. These stakeholders, after examining the resulting resources, can highlight essential aspects of data protection to adopt effective measures to secure student data in the digital age.

A. Searching phase

We have used the following inclusion and exclusion criteria to find OERs:

- Source Database: Google. Results themselves linked to other interesting resources that also have been added to the corpus.
- Language: English
- Type included: Any resource related to enhancing and better understanding data privacy and security concerns in schools. Examples of included resources are web articles, checklists, principles, templates, guides, toolkits, best practices, lessons, and infographics.
- Type excluded: Any resource not related to enhancing and better understanding data privacy and security concerns in school, including legal resources that could be difficult to understand for non-legal professionals.
- Date range: Since 2010 to 2023

We used different search strings that helped us to find OERs regarding privacy and security:

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[1] OER available at https://zenodo.org/record/7971603

- "data privacy resources for schools"
- "security resources for schools"
- "data protection resources for schools"
- "data protection guides for schools"
- "data protection toolkits for schools"
- "data protection checklist for schools"

B. Reviewing phase

The resources found were added to a Zotero group to facilitate organization and categorization. Different people involved in the project reviewed and tagged the resulting resources. Possible tags were:

- **Country**: The country that have created the resource.
- **Audience**: To whom the resources targeted (principals, parents, teachers, students…)
- **Type**: How the resource is presented (video, document, image…)
- **Content**: What the resource is used for (best practices, lesson, guide, checklist…)
- **Format**: The filetype or platform used to create the resource (PDF, YouTube, Vimeo, PPTX…)
- **Language**: The language in which the resource is presented.

3. RESULTS

The searching phase rushed 178 resources found in Google results and inside them. These resources where found after 9 months of searching and reviewing. After reviewing and discarding those that really weren't adequate, results found sum up to 146. As the project haven't finished, we hope to find more resources to add and share with schools.

Regarding countries of the OER, the United States of America is the country with the most resources published (72.6%, 106 out of 146), followed by United Kingdom (21.3%, 31 out of 146), France (2.05%, 3 out of 146), Canada (0.7%, 1 out of 146), Australia (0.7%, 1 out of 146), and New Zealand (0.7%, 1 out of 146).

It is evident that there is a range of content available for protecting the data of students. Figure 1 illustrates that guides comprise the largest portion, accounting for 32.2% (47 out of 146) of the resources. These guides play a crucial role in providing comprehensive information and step-by-step instructions on safeguarding student data. Additionally, toolkits represent 14.4% (21 out of 146) of the resources, indicating their importance in equipping educators with practical resources and tools for data protection. Lessons, at 19.18% (28 out of 146), offer structured educational materials focusing on the topic of data protection, which fosters awareness and understanding among educators and students. Reports constitute 9.6% (14 out of 146) of the available resources, providing valuable insights and analysis on data protection practices. These source content statistics demonstrate that a variety of resources exist to support the protection of student data, ensuring that educators and stakeholders have access to relevant information and tools to safeguard sensitive information effectively.

Figure 1 Word cloud of the types of resources

As shown in Figure 2, documents comprise most of the content at 47.9% (70 out of 146). Documents account for the highest proportion, indicating their significance as a prevalent medium for information dissemination. Following documents, websites make up 34.2% (50 out of 146) of the content. This indicates that websites play a substantial role in providing valuable information and resources to users. Videos comprise 16.4% (24 out of 146) of the content, highlighting their significance as an engaging medium for educational purposes. Lastly, images constitute a smaller portion, only 1.4% (2 out of 146) of the total content. This suggests that images are less commonly used compared to other forms of media for conveying information. These statistics emphasize the diverse range of content formats available and their varying levels of popularity in online resources.
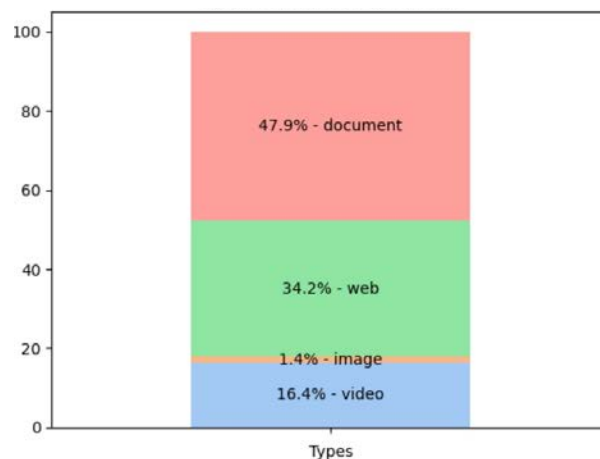

Figure 2 Types of content

The distribution of available resources is influenced by the target audience. As shown in Figure 3, principals represent the largest audience, being targeted by 42.5% (62 out of 146) of the resources. This indicates that a significant emphasis is placed on providing resources tailored to the needs and responsibilities of school principals, recognizing their crucial role in data protection. Teachers follow with 26.45% (39 out of 146) of the resources, acknowledging their direct involvement in handling and managing student data. The allocation of resources targeted at parents stands at 18.5% (27 out of 146), recognizing their importance as stakeholders in understanding and supporting data protection measures. IT administrators are the target of 9.8% (14 out of 146) of the available resources, highlighting their role in implementing technical safeguards and managing data infrastructure. Students, while comprising a smaller percentage at 2.8% (4 out of 146), still receive attention in terms of resources designed to educate and empower them about data

protection. These statistics reflect a well-rounded approach to addressing the needs of various stakeholders involved in protecting student data, ensuring that relevant resources are available to support their respective roles and responsibilities.
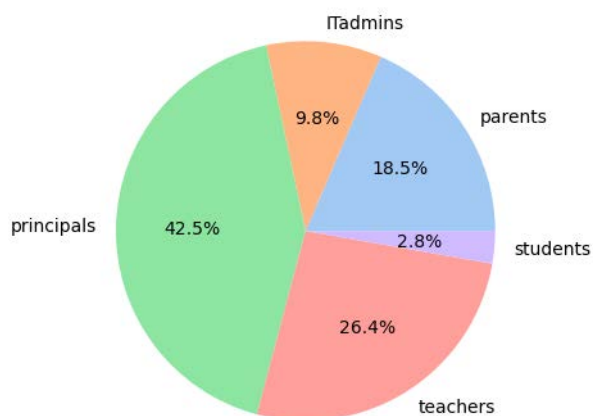

Figure 3 Resources audience distribution

4. CONCLUSIONS

The analysis of data obtained from a variety of online resources provides valuable insights into the landscape of content available for protecting student data. The findings demonstrate a diverse range of resources aimed at addressing this crucial aspect of education. Guides and toolkits emerge as the most prevalent resources, offering comprehensive information and practical tools for educators and administrators. Lessons and reports also contribute significantly, fostering awareness and providing in-depth analysis on data protection practices. These resources cater to the needs of different stakeholders, with principals, teachers, parents, IT administrators, and even students finding resources tailored to their roles and responsibilities. This comprehensive approach emphasizes the importance of collaboration and shared responsibility in safeguarding student data.

It is worth noting that while most resources target principals and teachers, there is an increasing recognition of the significance of involving parents, IT administrators, and students in data protection efforts. The availability of diverse resources, such as guides, toolkits, lessons, and reports, showcases the commitment towards ensuring the long-term viability of data protection practices. By equipping all stakeholders with the necessary knowledge and tools, a holistic approach to safeguarding student data can be established. Considering the insights and recommendations provided in this article, and as an example of application of results, stakeholders in diverse educational contexts are encouraged to consult contents to enhance their understanding and implementation of data protection practices, thereby ensuring the security and privacy of student information.

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