# The effect of Social Networking-based Multimedia Repository on Promoting Open Educational Resources

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**Abstract.** In recent years, the Open Education movement has emerged as an innovative approach in the field of education. Closely connected to it are the Open Educational Resources (OERs), which are hosted in Digital Repositories. Despite their unique advantages, global recognition, and increasing numbers, OERs have not yet become fully established. Teachers encounter various challenges in using OERs, including a lack of pedagogical knowledge about their value, usage, production, and integration into teaching. At the same time, many digital repositories are considered inadequate, facing issues such as difficulty in content search, incomplete content, and insufficient assistance for users. As such, this research aims to maximize OERs potential and utilization, introducing a social networking-based multimedia repository. This repository fosters interaction, communication, and collaboration, educating teachers about OERs. The main goal of the research is to determine whether incorporating social networking features into a repository could positively influence users' experience, access frequency, and the utilization of OERs in teaching. A quantitative research method was employed, showing the positive impact of social networking features on teacher attitude and intention to use OERs in their instruction.

**Keywords:** Digital repository, Multimedia content, Open Education, Open educational resources, Social network.

## 1 Introduction

Open education is an innovative approach that aims to make high-quality educational resources and opportunities accessible to all, overcoming the restrictions of traditional education [1]. This approach is supported by the widespread use of Open Educational Resources (OERs), which are freely available teaching, learning and research materials that can be used and modified by anyone [2]. OERs are typically offered under a Creative Commons (CC) license, enabling authors and creators to retain copyright while allowing others to copy, distribute, and modify them [3]. Literature has shown that OERs can enhance teaching effectiveness and learning outcomes by providing flexible and adaptable resources [4, 5]. OERs constitute a multimedia content, including open

textbooks, e-books, entire course series or modules, lesson plans, tutorials, videos, images, infographics, audio files, podcasts, interactive games, quizzes, learning tools, open access journal articles, lectures, and more [6].

Digital repositories play a crucial role in the dissemination and accessibility of OERs. These repositories are multimedia platforms where diverse educational materials are stored, organized, and made freely available to educators and learners worldwide. There are various types of repositories depending on the content they distribute, the users this content refers and purpose they serve, such as teaching, learning, and administrative processes [7, 8]. Therefore, the repositories can cover one or more academic subjects or courses, or even an entire educational level, and are categorized into different types: Institutional Repositories, Subject Repositories, Format Repositories, National Repositories, and Research Repositories [2, 9].

Despite unique properties, global recognition, and increasing numbers of OERs and digital repositories, their usage level remains low, particularly among primary and secondary education teachers (K-12 education) [10, 11]. Research shows that teachers face numerous challenges in using OERs, including the lack of proper technological skills, willingness, and pedagogical knowledge about the value, use, production, and integration of OERs into teaching [3, 5]. Moreover, issues such as low quality, insufficient added pedagogical value, and difficulty in finding up-to-date and relevant OERs further limit their adoption [1, 8, 12]. These challenges highlight the need to enhance the acceptance and integration of OERs in teaching [11].

A deep understanding of the potential of OERs by teachers and their connection to providing quality teaching can increase their utilization [3, 4]. A crucial step to achieve this is the development of a multimedia repository that hosts high-quality educational material, promoting collaboration and interaction. Such an environment can enhance user motivation and engagement [13]. Receiving feedback on the OERs can further encourage teachers to share educational resources, receive constructive criticism, and gain assistance and recognition [14, 15].

In recent years, social networks have become an important part of daily life for many individuals, serving as one of the most significant communication tools [16, 17]. The integration of social networks into education has introduced new teaching and learning methods, such as Social Learning, which utilizes social networks for educational purposes or incorporates social networking elements into e-learning systems [16]. These networks provide a personalized and user-friendly interface for sharing multimedia content and effectively communicating and collaborating among open communities [8, 11, 16 – 19].

In view of the above, this paper aims to strengthen the OERs movement and fully utilize their potential by identifying and developing effective strategies to enhance their acceptance. As such, a social networking-based multimedia repository for primary education was developed. This repository allows teachers to access, share, collaborate on various educational resources, such as interactive exercises, quizzes, presentations, videos, and more, review, comment on and rate the content they access. By integrating into a social network, the repository facilitates communication and collaboration among educators, enhancing the exchange of ideas and best practices. As such, the introduced repository constitutes an innovative approach for sharing educational content online,

enhancing resources to address the teaching needs in primary education, addressing the lack of open access repositories and communities of practice, as well as ensuring access to high quality material through reacting and commenting on educational resources.

This study addresses the following research questions:

1. Does the integration of social networking features in a multimedia repository positively affect the user experience?
2. To what extent do the social networking features integrated into a multimedia repository influence the frequency of user access?
3. Does the use of a social networking-based multimedia repository by educators impact the degree of OERs utilization in their teaching?

## 2 Description of Social Networking-based Multimedia Repository

### 2.1 Multimedia OERs

The developed system is a social networking-based digital repository which consists of multimedia content focused on primary school lessons. This repository provides OERs to help teachers in preparing, enhancing, or supplementing their teaching practices. As such, the system can be categorized into Subject Repositories, and in particular within the subcategory of independent repositories.

The OERs in the repository vary widely in their educational, technological and multimedia characteristics. The repository includes interactive exercises, quizzes, crosswords, presentations, videos, images, assessment tests, worksheets, and more. To facilitate searching and selection, the OERs are categorized into six main categories based on the primary education grade level they target, and further divided into subcategories by subject. Additionally, each OER is tagged with one or more keywords or phrases for easier identification. The chosen open licenses for the OERs are Creative Commons (CC) licenses, specifically: Attribution – Non-Commercial - Share Alike (CC BY-NC-SA), Attribution – Non-Commercial - Share Alike 3.0 Greece (CC BY-NC-SA 3.0 GR), and Public Domain Dedication (CC0).

Each OER is associated with metadata, which is a set of data that identifies it. The metadata schema used in the repository is based on the Dublin Core metadata schema, managed by the Dublin Core Metadata Initiative IEEE Learning Technology Standards Committee. Each resource is accompanied by its title, a representative image (thumbnail), and metadata that include both general information and classification data. General elements include a brief description of the content, keywords, creation date, author, source, and the license under which the OER is distributed. Classification elements cover the subject area, target class(es), and type of resource. Moreover, repository members can rate each OER by clicking on one of five stars or leave comments. This rating score reflects the quality and the effect on the community of each OER.

## 2.2   System Functionality

The multimedia repository is integrated into a social network, providing a dynamic platform where members can engage in various social activities. As such, they can exchange public and private messages, fostering direct communication and collaboration. Furthermore, they can make friends, create and join groups, and engage in status updates (posts) enhancing community interaction.

Members can publish and share OERs that they have developed or customized, enabling them to contribute to and expand the repository's content. This collaborative environment encourages feedback, allowing members to receive constructive insights and suggestions on their shared OERs. Additionally, members can easily identify, rate, comment on, and share OERs on their personal profiles, facilitating broader dissemination and discussion of educational resources.

Interest-based groups further enhance the repository's functionality by promoting user-generated content in specific subjects. These groups serve as hubs for focused discussions, resource sharing, and collaborative projects. The activity stream records all activities in the network, including posts, new friendships, and comments, providing a comprehensive overview of member interactions and contributions.

A crucial feature of the user experience is the notification module, which alerts members to new activities and updates. This module not only keeps members informed, but also motivates them to stay engaged and active within the repository. By fostering continuous interaction and participation, the notification module enhances the overall utility of the social network-based multimedia repository.

## 3   Research Methodology

In order to assess the effect of social networking feature on the multimedia repository, an empirical study was developed. The quantitative research method was employed to collect information through a questionnaire distributed to participants. The goal was to quantify opinions regarding the relationship of a repository's social networking features with (1) the user experience of the repository, (2) the frequency of user access, and (3) the utilization of OERs in teaching.

The study involved 32 primary education teachers, whose demographic characteristics are shown in Table 1. Participants were asked to use the developed repository for 6 months, and afterwards a questionnaire was delivered to them for collecting their opinion and recording their experience.

**Table 1.** Participants' Demographic characteristics.

|        | Characteristic | Percentage |
|--------|----------------|------------|
| Gender | Male           | 75 %       |
|        | Female         | 25 %       |
| Age    | < 25           | 3.1 %      |
|        | 26 – 35        | 62.5 %     |
|        | 36 – 45        | 21.9 %     |
|        | 46 – 55        | 9.4 %      |

| | > 56 | 3.1 % |
|---|---|---|
| Education | BSc | 46.9 % |
| | MSc | 53.1 % |
| | PhD | 0 % |
| Years of Teaching Experience | 0 – 5 | 46.9 % |
| | 6 – 10 | 28.1 % |
| | 11 – 15 | 12.5 % |
| | 16 – 25 | 9.4 % |
| | > 26 | 3.1 % |

The questionnaire consisted of 24 questions, selected and formulated to address the 3 research questions. A 5-point Likert scale was utilized, providing five response options for each question. The questionnaire was divided into four distinct sections: (1) demographic information, (2) user experience with a social networking-based multimedia repository, (3) frequency of access to a social networking-based multimedia repository, and (4) degree of OERs utilization in teaching due to the experience of using a social networking-based multimedia repository.

## 4    Evaluation Results

### 4.1    User experience

Ranking the results based on the level of agreement ("Agree" and "Strongly Agree") regarding the effect of social networking features on the user experience of a multimedia repository, interest-based groups hold the highest position with 97% (Fig. 1). This is followed by content generation at 94% and message exchanges at 91%. While the creation of personal profiles and the notification system get 88%. All social networking features received an agreement percentage of 70% or higher. Furthermore, disagreement levels ("Disagree" and "Strongly Disagree") are negligible for all social networking features, and in some cases, nonexistent, not exceeding 3% of total responses for any feature.
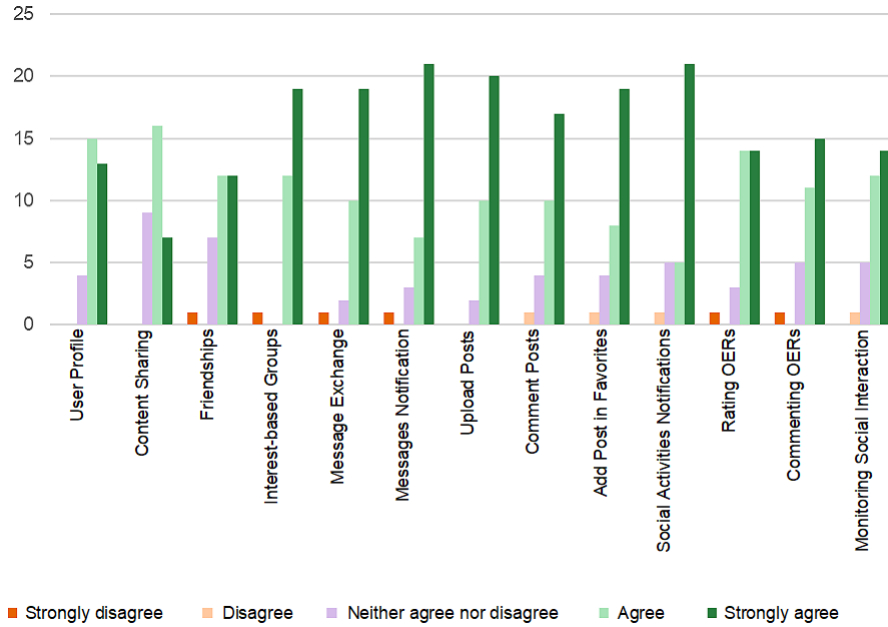
**Fig. 1**. Effect of social networking features on multimedia repository's user experience.

Regarding teachers' preference in the most used social networking functionalities, interest-based groups took the primary position with 54% (Fig. 2). This preference can be occurred due to their ability to facilitate dialogue, exchange opinions, ideas, and educational materials on specific topics, and keep members informed about specialized issues. Posts hold a particularly high position at 20%, in terms of their creation, commenting, and marking as favorites. Participants supported this functionality by highlighting the ability to share ideas, suggestions, thoughts, and materials. Creating a network of friends gets 13%, justified by the creation of smaller communities for interaction and monitoring their posts.
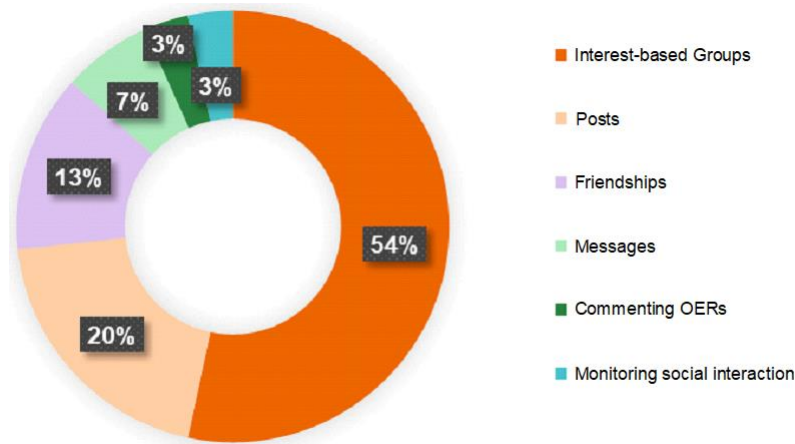
**Fig. 2.** The most used social networking functionalities.

Almost all of the teachers agreed (97%) that the repository's user interface positively influenced their user experience, finding it both usable (94%) and easy in use (97%). Finally, regarding the overall experience of using the social networking-based multimedia repository, it is observed that teachers found it pleasant with a percentage of 97%. There was no participant who did not find it pleasant, except for a very small percentage, 3%, who kept a neutral attitude, since they neither agreed nor disagreed with this proposal.

## 4.2    Frequency of access

Examining the aggregate results on the impact of social networking features on access frequency to the repository, it is observed that the majority of teachers believe that the overall social networking features moderately, considerably, or significantly influenced their access frequency (Fig. 5). For most social networking features, the percentage exceeds 90%, while in a few cases, it surpasses 80%. Summarizing the options associated with a high degree of influence, namely "Considerably" and "Significantly," it is found that for all social networking features, the percentage exceeds 55%. Ranking the results shows that the user interface holds the top position with 94%. This is followed by interest-based groups and message exchange, each at 91%, and then friendships and activity tracking, each at 81%. The least influence on access frequency seems to be the sharing of personal information through the profile (e.g., profile photo, education, brief biography, skills & interests) at 19%.
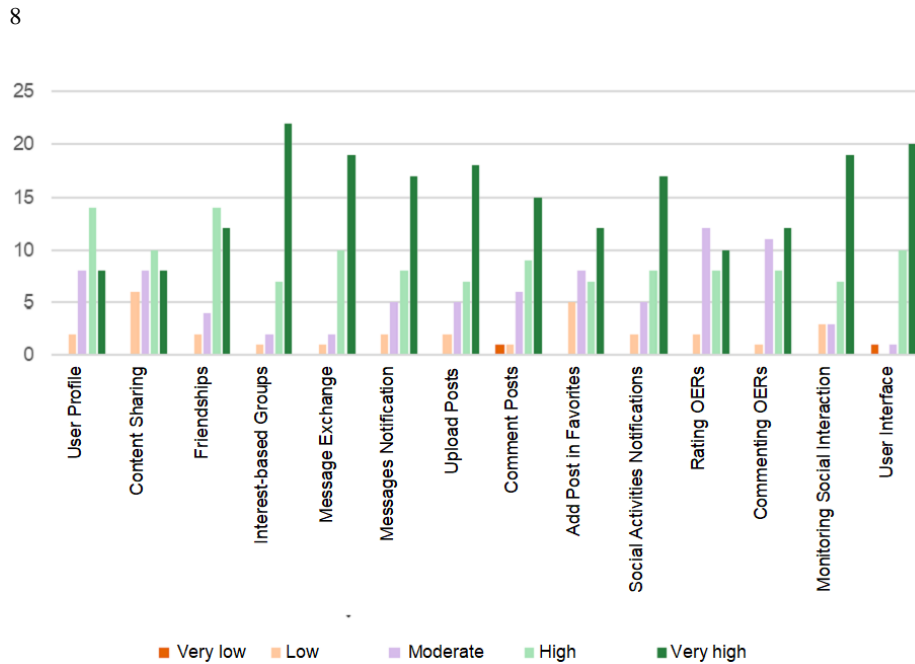
**Fig. 3.** Effect of social networking features in access frequency to the repository.

### 4.3 Degree of OERs utilization

Analyzing the results regarding teachers' knowledge about OERs before using the repository, it is observed that slightly over half of the participants (56%) either had no knowledge or had little knowledge on this subject (Fig. 4). Meanwhile, the percentage of participants who knew well and a lot about OERs before using the repository was 38%. A particularly small percentage had moderate knowledge about OERs, reaching only 6%. Summarizing the percentage of those who were moderately to significantly aware of OERs, the percentage reaches the 44%.

Regarding the integration of OERs in teaching before using the repository, it is noted that the largest percentage (44%) used little or no OERs in their teaching (Fig. 4). The percentage of those who used OERs considerably or significantly in teaching was 28%, the same percentage as those who made moderate use of OERs in their teaching before their experience with the repository. Therefore, 56% of teachers used OERs from moderately to significantly in their teaching before using the developed repository.
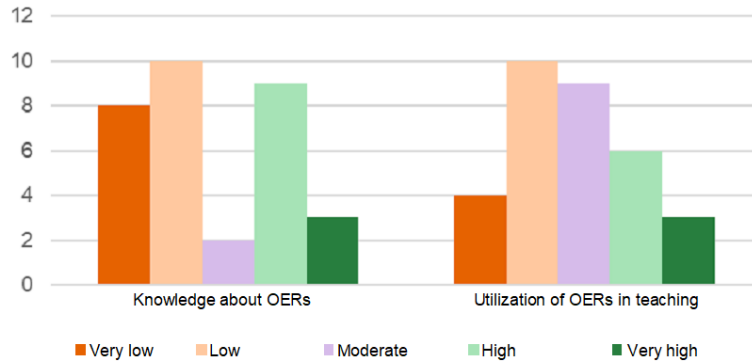
**Fig. 4.** Knowledge about OERs and their utilization before using the developed repository.

Concerning the enrichment of participants' knowledge about defining, creating, adapting, and sharing OERs, it is observed that in all cases, the vast majority of responses are positive (Fig. 5), with 97% stating that their knowledge was enriched from moderate to a significant extent. The enrichment of knowledge regarding OERs adaptation received exclusively positive responses (100%), as all teachers stated that their knowledge was enriched moderately, considerably, or significantly after using the repository.
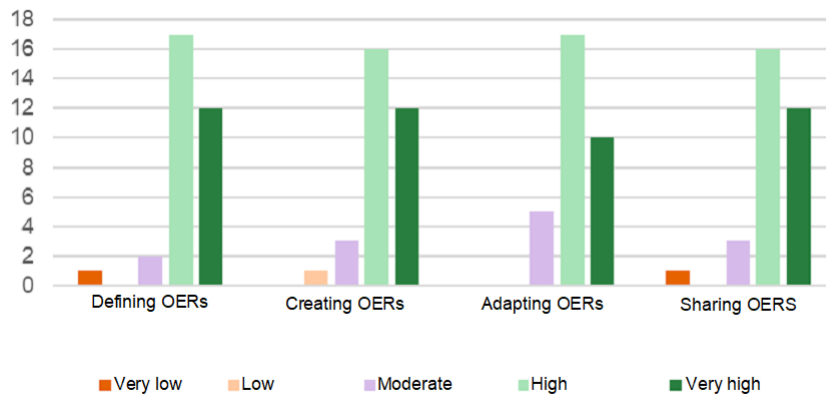


**Fig. 5.** Enhance knowledge about OERs after using the developed repository.

Regarding whether the enrichment of knowledge about OER contributed to increasing their integration into teaching by the participating teachers, it is found that in all cases, the positive responses are the majority ($\geq 94\%$) (Fig. 6).
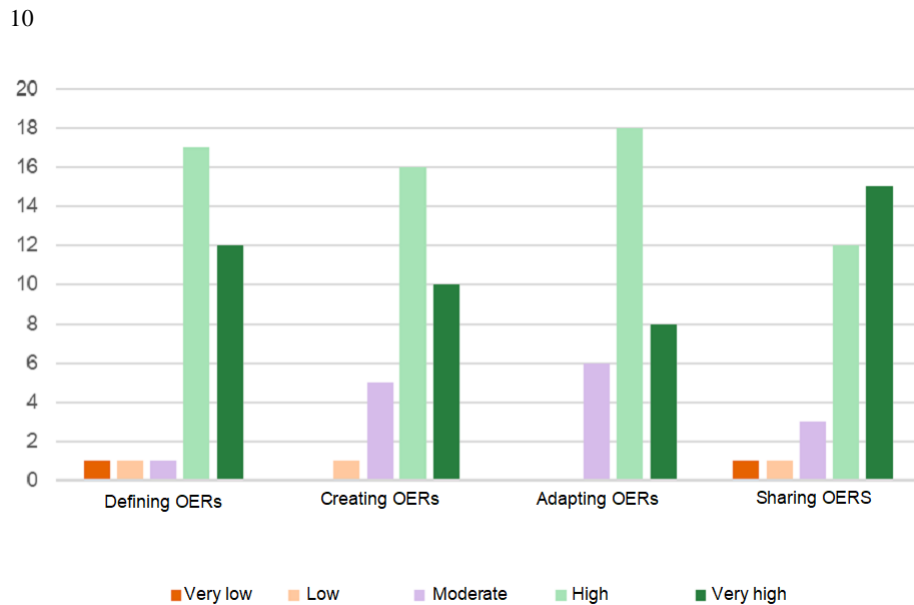
**Fig. 6.** Contribution of defining, creating, adapting and sharing OERs to increasing the degree of their integration in teaching.

Finally, concerning the aggregate results for increasing the degree of OERs utilization in teaching as a result of repository's experience, it is observed that with 97%, the vast majority increased the degree of OER integration into their teaching from moderate to significant. The percentage of teachers who stated that the degree of OER integration in teaching increased slightly is negligible, and no one stated that the degree of OER integration did not increase at all. Regarding the intention for future OER utilization, all participants (100%) stated that they intend to use OER moderately, considerably, or significantly in their teaching.

## 5    Discussion

The current research highlights that the majority of teachers ($\geq 70\%$) believe that integrating social networking features in a multimedia repository positively impacts the user experience. The most attractive features appeared to be interest-based groups (97%), the generation of posts (94%), and message exchanges (91%). These results are supported by teachers' responses when asked which social networking functionalities they used the most and why, with interest groups ranking first (54%), followed by posts (20%), including their creation, commenting, and marking as favorites, and finally, forming friendships (13%). The reasons given for the usefulness of these social networking features included facilitating dialogue, exchanging opinions, ideas, proposals, and materials, and creating communities for interaction. These results align with findings in the literature, which suggest that incorporating social networking elements into an online educational environment leads to the creation of interactive and open learning communities [5, 8].

In addition, an overwhelming percentage (97%) of teachers rated the user interface as usable (94%) and user-friendly (97%), confirming that social networks offer a multimedia interface that promotes usability and ease of use [16, 17], enhancing user experience [15, 18]. This fact explains the extremely high percentage of those who rated the positive influence of the user interface on the repository experience (97%). Similarly, a high percentage found the overall experience of using the repository enjoyable (97%).

Regarding the extent to which the social networking features incorporated into a multimedia repository affect users' frequency of access, the majority of teachers ($\geq$ 80%) felt that all the social networking features of the repository played an important role in how often they were visiting the repository. The user interface (94%), interest-based groups (91%), and message exchanges (91%) had the most significant impact, followed by friendships and activity tracking (81%). This confirms the assertion that social networking features can enhance user engagement [16].

Confirming the study of [12], this research showed that before using the developed repository, over half of the participants (56%) were only slightly or not at all aware of OERs, and 44% either did not incorporate them into their teaching at all or did so to a limited extent. The variance between these percentages indicates that some teachers were using OERs without being aware of them. These results are consistent with findings from several studies [3, 12, 20], which show that the levels of OERs use among primary education teachers either remain low due to a lack of awareness. The percentage of participants who was slightly aware of OERs before using the developed repository, was 44%, while 56% had already incorporated OERs into their teaching.

An impressive percentage of teachers ($\geq$ 97%) reported that after using the social networking-based multimedia repository their knowledge of what OERs are, how they are created, adapted and shared, was enriched. Thus, it appears that the interaction and collaboration in learning communities can indeed lead to knowledge building, as highlighted by the study of [17]. Given that humans are inherently social creatures, peer interaction in a social environment can enhance knowledge acquisition [11]. The increased incorporation of OERs in teaching was attributed to the enrichment of knowledge about OERs ($\geq$ 94%) and the overall repository experience (97%). Therefore, it is evident that the use of a repository with social networking features by teachers affects the extent to which they utilize OERs in their teaching. Finally, all participating teachers (100%) stated that they intend to use OERs in their teaching in the future. These findings support several researchers' assertions that (1) familiarity with OERs leads to a more favorable attitude towards them [10], (2) a deep understanding of OERs' potential, along with their connection to providing quality teaching, can increase their utilization [3, 4], and (3) teachers with experience in adapting, creating, and sharing OERs are more likely to adopt the technology [11].

## 6    Conclusions

This paper seeks to address the current challenges in OERs adoption by leveraging the collaborative and interactive capabilities of social networks to foster a more engaging and supportive environment for educators. By combining the accessibility and flexibility of OERs with the dynamic interactions provided by social networking, this research aims to promote the integration of OERs into teaching practices, ultimately enriching the educational experience and expanding the impact of OERs.

As such, a social networking-based multimedia platform was developed. A quantitative research method was employed, involving 32 primary education teachers. The research findings indicate that integrating social networking features in a multimedia repository positively impacts the user experience and access frequency. User interface, interest groups, and messaging have the most significant impact, with friendships and activity tracking following. Moreover, using a social networking-based multimedia repository enhances knowledge about OERs, which in turn positively affects their utilization in teaching.

Part of our future plans is the extension of the sample and the comparison of the developed repository with other ones without incorporating social networking features, in order to further assess the importance of this approach. Moreover, another interesting and promising area for future investigation is the incorporation of AI technologies for searching, generating and assessing OERs.

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