European Journal of Education Studies
ISSN: 2501 - 1111
ISSN-L: 2501 - 1111
Available online at: www.oapub.org/edu

DOI: 10.46827/ejes.v12i11.6283 Volume 12 | Issue 11 | 2025

DEVELOPING AND USING DIGITAL LEARNING RESOURCES IN TEACHING NATURAL AND SOCIAL SCIENCES AT THE PRIMARY LEVEL: A SURVEY STUDY IN THAI NGUYEN PROVINCE, VIETNAM

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Abstract:
Digital transformation in education has emerged as an inevitable trend in improving the quality of teaching and learning. Particularly, in the context of Vietnam's 2018 General Education Curriculum, the integration of digital learning resources (DLRs) into teaching has become an urgent requirement to foster students' competencies and qualities. This study investigates the development and use of DLRs in teaching Natural and Social Sciences at the primary level, focusing on grade 3 in Thai Nguyen province. Employing a descriptive survey design, data were collected from 118 teachers and 160 students through questionnaires, interviews, and classroom observations. Quantitative data were analyzed using descriptive statistics, while qualitative insights were obtained from interviews and observations. Findings reveal that most teachers acknowledged the importance of DLRs; however, challenges such as limited time, inadequate facilities, insufficient funding, and teachers' technological skills hindered their effective use. Meanwhile, students demonstrated a highly positive attitude, affirming that DLRs made lessons more engaging and easier to understand. The study also proposed a number of measures for designing and using DLRs in primary education to enhance interactivity, motivation, and self-learning ability. These results highlight the critical role of DLRs in modernizing education and provide practical recommendations for policymakers, schools, and teachers to optimize digital resource integration.

Keywords: digital learning resources; natural and social sciences; primary education; digital transformation; teaching innovation

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1. Introduction

Education in the digital era is increasingly shaped by the rapid development of information technology and the growing demand for innovation in teaching and learning. In Vietnam, the 2018 General Education Curriculum (GEC 2018) emphasizes competency-based and learner-centered approaches, requiring teachers to adopt modern pedagogical strategies that integrate technology effectively [1]. Within this context, the use of digital learning resources has become essential in enhancing the quality of classroom instruction, encouraging student engagement, and fostering self-learning capacity.

The subject *Natural and Social Sciences* at the primary level plays a crucial role in equipping students with foundational knowledge about themselves, their community, and the natural world. However, the subject's characteristics require teaching approaches that are experiential, interactive, and closely connected with reality. Traditional teaching methods relying mainly on textbooks and verbal explanations often fail to fully engage students or stimulate curiosity. Therefore, the integration of DLRs - such as interactive videos, digital diagrams, simulations, and online exercises- offers significant potential to enrich the learning experience.

Despite its importance, the effective use of DLRs in Vietnam still faces multiple barriers. Teachers often encounter limitations related to technological skills, time constraints, and insufficient facilities, while students may lack equal access to digital devices. Prior studies have highlighted the benefits of DLRs in improving visualization, interactivity, and motivation; however, few have examined their application in teaching *Natural and Social Sciences* at the primary level, especially in local contexts such as Thai Nguyen province. This creates a research gap that the present study seeks to address.

Accordingly, this study was conducted with a sample of 118 primary school teachers and 160 students in Thai Nguyen province. The main objectives are: (i) to investigate teachers' and students' perceptions of DLRs in teaching Natural and Social Sciences; (ii) to identify challenges in building and using DLRs; and (iii) to propose practical strategies for integrating DLRs into classroom teaching. The findings aim to contribute both theoretical and practical insights, supporting educators, policymakers, and schools in promoting digital transformation in primary education.

2. Literature Review

2.1 International Perspectives on Digital Learning Resources

Globally, research has highlighted the transformative potential of DLRs in primary education. Huang's case study in Taiwan demonstrated that integrating digital library resources into social studies instruction fostered not only factual knowledge but also critical skills such as teamwork, information searching, and presentation abilities among fourth-grade students [2]. Similarly, Yerahmetkyzy et al. (2022) showed that digital educational technologies significantly improved children's literature learning, with

students reporting greater engagement when exposed to multimedia and interactive resources [3].

Further, the concept of usability and accessibility in DLR platforms is emphasized as crucial. Studies argue that successful adoption depends not only on technological availability but also on ensuring inclusivity and user-friendly design, especially for young learners and their teachers [4]. In the context of Education for Sustainability, Sá & Rodrigues (2024) highlighted the role of design-based research (DBR**)** methodology in creating digital resources tailored to primary education, stressing iterative collaboration between researchers, teachers, and students to ensure pedagogical relevance [5]

Recent works also point to the importance of technology readiness. Maryani et al. (2023) confirmed that elementary students' readiness to use digital tools strongly predicted their online learning outcomes during the COVID-19 pandemic, underlining the link between digital preparedness and academic achievement [6]. This resonates with broader literature that emphasizes the need to strengthen both teacher and student digital competencies to maximize the benefits of DLRs [7], [8].

2.2 Teachers' Perspectives and Professional Development

Teachers' perceptions and readiness play a critical role in DLR integration. Blyznyuk stressed that future primary teachers must acquire ICT competencies during pre-service training, with practical exposure to tools such as Kahoot, Mentimeter, and Flipgrid proving effective in promoting creativity and formative assessment [9]. However, many educators still use DLRs primarily for lesson presentation rather than for designing interactive activities, which aligns with global concerns about underutilization of digital resources due to time and skill constraints. [9]

In Brazil, Munhoz dos Santos et al. (2022) surveyed over 1,300 teachers and found that most educators limited their use of digital tools to simple activities like creating PowerPoint slides. While teachers valued HLS, their ability to design more complex resources was low, revealing a gap in training and professional development [10]. These results highlight the pressing need for systematic teacher training programs that focus not only on technical proficiency but also on pedagogical integration of digital resources.

2.3 Students' Perspectives and Digital Readiness

Students generally respond positively to DLRs. Yerahmetkyzy et al. (2022) found that students who engaged with digital platforms for literature education not only improved their learning outcomes but also demonstrated higher motivation [3]. Similarly, Maryani et al. (2023) demonstrated that students with higher technology readiness achieved significantly better academic results [6]. However, findings also suggest that self-directed learning with DLRs remains underdeveloped among younger learners, who often rely heavily on teacher guidance.

While international and regional studies underline the benefits of DLRs, significant research gaps remain. Most works focus on either technological infrastructure or teacher competencies, with fewer studies addressing the joint perspectives of both

teachers and students in specific subjects. Moreover, many studies are conducted at a small scale, within experimental or pilot projects, limiting their generalizability. In Vietnam, research has primarily concentrated on designing standalone digital products, without sufficient attention to how teachers and students perceive and use them in real classrooms. This study addresses these gaps by simultaneously investigating teachers' and students' perceptions of DLRs in *Natural and Social Sciences* at the primary level in Thai Nguyen province.

Based on the research gap identified in the literature, this study aims to investigate the development and use of digital learning resources in teaching *Natural and Social Sciences* at the primary level in Thai Nguyen province, Vietnam. Specifically, the objectives are:

- To examine teachers' perceptions of the importance, frequency, and purposes of DLR use.
- To analyze students' attitudes toward DLRs, focusing on engagement, perceived benefits, and participation in digital learning activities.
- To identify challenges faced by teachers and students in building and using DLRs.
- To propose strategies for designing and applying DLRs in ways that enhance interactivity, motivation, and self-directed learning in primary education.

Through these objectives, the study seeks to contribute both theoretical insights into the role of DLRs in primary education and practical recommendations for policymakers, school administrators, and teachers.

3. Methodology

This study employed a descriptive survey research design, supplemented by classroom observation, to investigate the development and use of digital learning resources in teaching Natural and Social Sciences at the primary level.

3.1 Research Design

A mixed-methods approach was applied, combining quantitative and qualitative techniques. Quantitative data were collected through questionnaires administered to teachers and students, while qualitative insights were derived from interviews and classroom observations. The study did not include experimental validation; instead, it focused on descriptive and exploratory analysis of teachers' and students' perspectives.

3.2 Population and Sample

The research population consisted of primary school teachers and students in Thai Nguyen province. The study sample included 118 teachers and 160 grade 3 students, selected from various primary schools across the province. Teachers were chosen based on their direct involvement in teaching *Natural and Social Sciences*, while students were selected to ensure representation of different learning contexts.

To provide a clearer picture of the participants, the teacher sample profile is presented in Table 1. It shows the distribution of teachers by gender and teaching experience, ensuring representation across different demographic and professional backgrounds.

Table 1: Teacher Sample Profile (N = 118)

Variable	**Category**	**N**	**%**
Gender	Male	35	29.7
	Female	83	70.3
Subtotal		**118**	**100.0**
Teaching experience	Under 5 years	18	15.3
	5–10 years	30	25.4
	10–20 years	47	39.8
	Over 20 years	23	19.5
Subtotal		**118**	**100.0**

3.3 Data Collection Tools

3.3.1 Questionnaires

Two sets of questionnaires were designed—one for teachers (focusing on awareness, practices, and difficulties in using DLRs) and one for students (focusing on attitudes and experiences with DLRs).

3.3.2 Interviews

Semi-structured interviews with a subset of teachers provided deeper insights into their perceptions, challenges, and recommendations.

3.3.3 Classroom Observations

Direct observations were conducted to record actual teaching practices and the integration of DLRs.

3.4 Data Analysis

Quantitative data were processed using descriptive statistics (frequency, percentage, mean scores) to identify patterns and trends. Qualitative data from interviews and observations were analyzed thematically to triangulate findings and enrich interpretation.

3.5 Ethical Considerations

Participation was voluntary, and informed consent was obtained from all respondents. Confidentiality and anonymity were strictly maintained. The study was conducted in accordance with ethical standards in educational research.

4. Results

4.1. Teachers' Perceptions of DLRs

Figure 1 shows teachers' perceptions of digital learning resources in teaching *Natural and Social Sciences*.

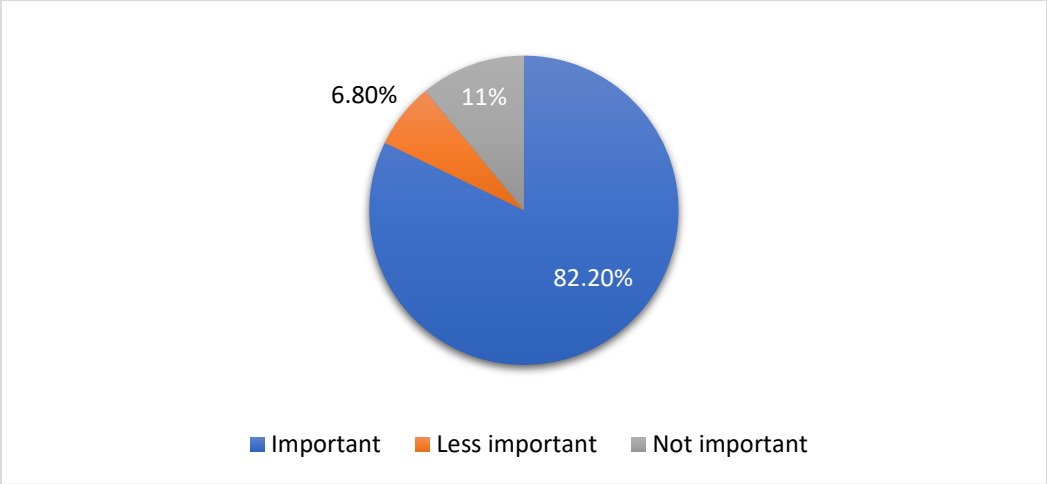

Figure 1: Teachers' perception of DLRs

Figure 1 illustrates teachers' perceptions of digital learning resources in teaching *Natural and Social Sciences*. The majority of teachers (82.2%) considered DLRs to be important, showing a strong recognition of their value in enhancing lesson effectiveness and student engagement. A smaller proportion (6.8%) regarded them as less important, while 11.0% did not consider them important at all. This indicates that although most teachers acknowledge the significance of DLRs, there remains a minority who are either hesitant or unconvinced about their role in primary education. Such differences in perception suggest the need for further training, resource provision, and awareness-raising activities to promote more widespread and effective use of DLRs in teaching practice.

4.2 Teachers' Practices in Using DLRs

Teachers reported varied practices in designing and using DLRs. As seen in Figure 2, the most frequent activity was using DLRs in knowledge formation (56.8% frequently), while designing interactive exercises was the least common (24.6% frequently).

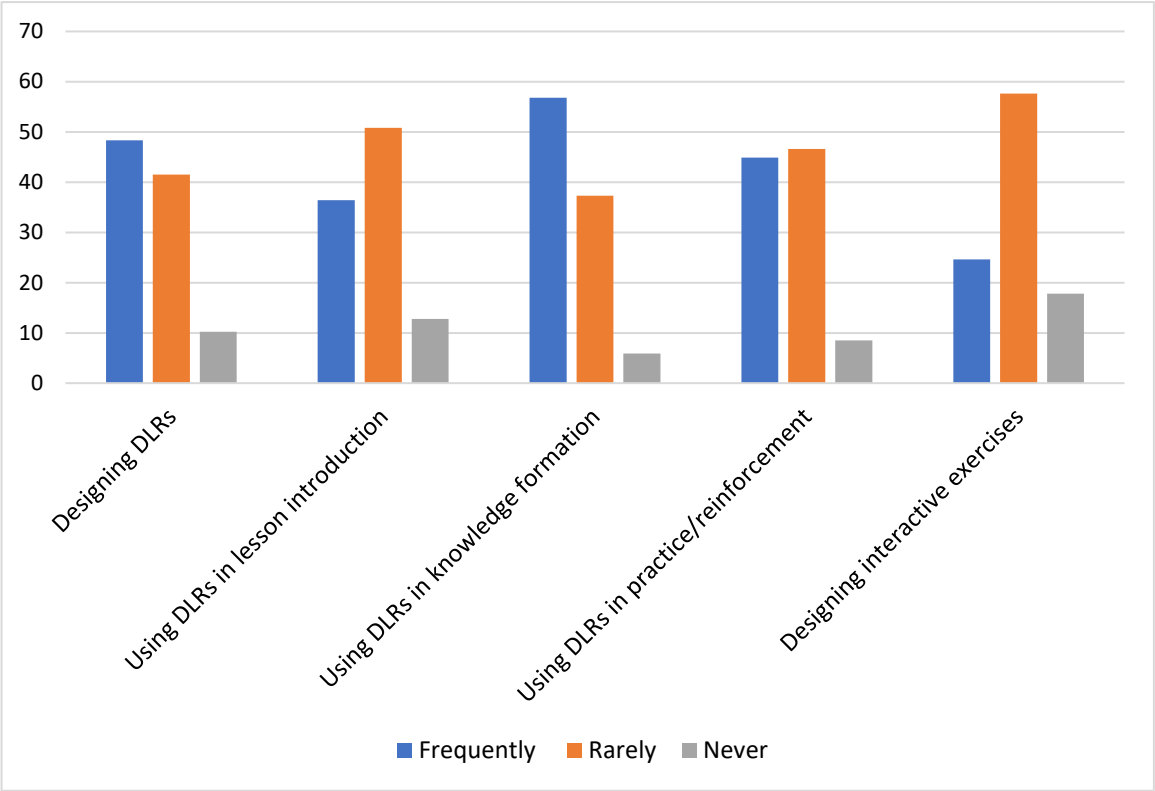

Figure 2: Teachers' practices in using DLRs

Figure 2 presents teachers' practices in designing and using digital learning resources in teaching *Natural and Social Sciences*. The data show that teachers most frequently integrated DLRs in the knowledge formation stage, with 56.8% reporting regular use, followed by practice and reinforcement activities (44.9%) and lesson introduction (36.4%). Meanwhile, 48.3% of teachers frequently designed their own DLRs, indicating a moderate level of initiative. However, the lowest proportion was recorded for designing interactive exercises, with only 24.6% doing this frequently, while a large percentage admitted to rarely (57.6%) or never (17.8%) engaging in such practices. These results suggest that while teachers recognize the value of DLRs for content delivery, their application in more interactive, student-centered activities remains limited, likely due to time constraints, insufficient technical skills, or lack of support tools.

4.3 Teachers' Challenges in Using DLRs

Figure 3 summarizes the major challenges teachers faced. The most reported issues were lack of time (71.2%), insufficient funding (68.6%), and lack of facilities (65.3%).

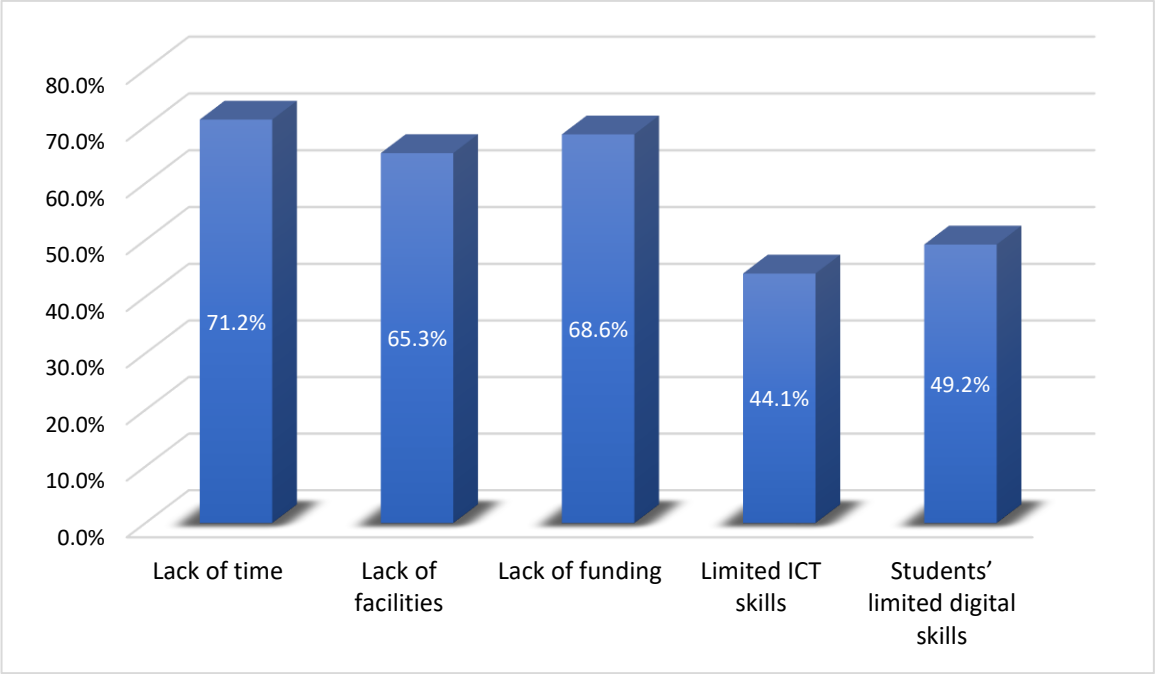

Figure 3: Teachers' challenges in using DLRs

Figure 3 illustrates the challenges faced by teachers in using digital learning resources for teaching *Natural and Social Sciences*. The most prominent difficulty reported was lack of time, with 71.2% of teachers identifying it as a major obstacle. This was followed by a lack of funding (68.6%) and inadequate facilities (65.3%), highlighting systemic limitations in resources and infrastructure. Additionally, 44.1% of teachers admitted to limited ICT skills, while 49.2% pointed out that students themselves lacked digital skills, which hindered the effectiveness of DLR use. These findings indicate that although teachers are aware of the potential benefits of DLRs, their practical application is constrained by both external factors (infrastructure, funding, time) and internal factors (digital literacy of teachers and students). Addressing these barriers requires not only improved investment in technology but also targeted training and support for teachers.

4.4 Students' Attitudes toward DLRs

Figure 4 presents students' responses. Of 160 students, 86% agreed that DLRs made lessons more interesting, 83% stated that lessons were easier to understand, and 81% wished to use DLRs more often.

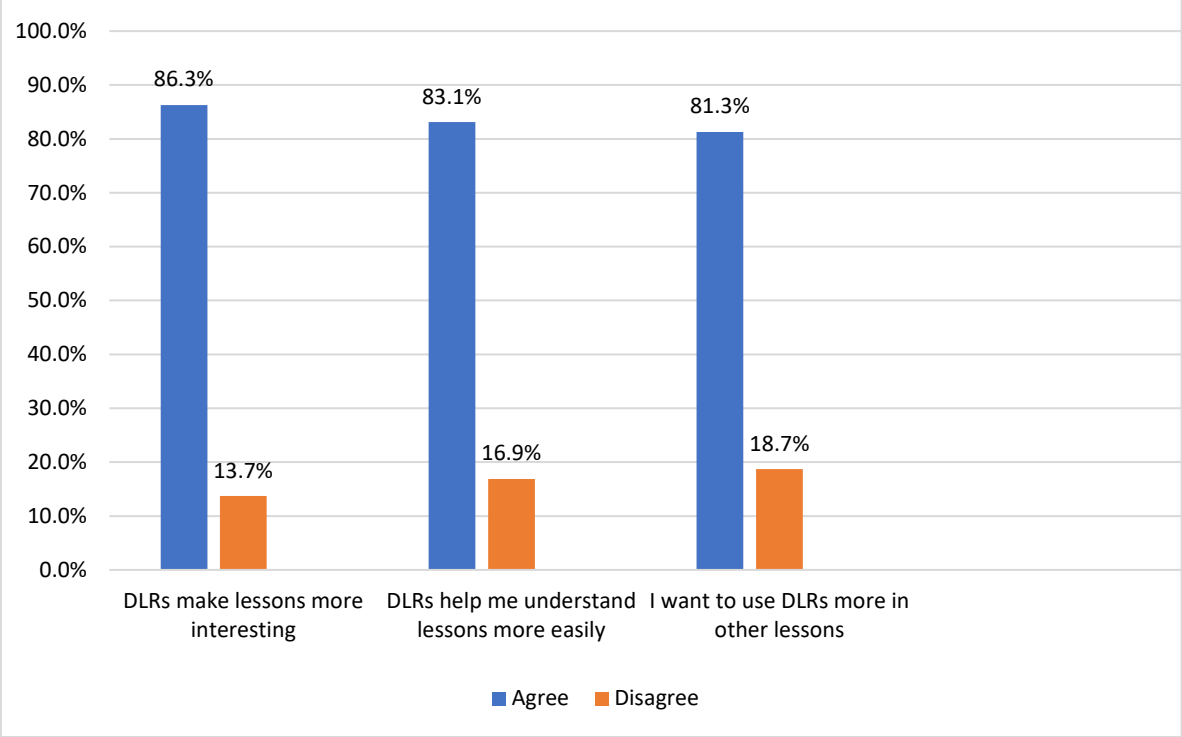

Figure 4: Students' attitudes toward DLRs

Figure 4 shows students' attitudes toward digital learning resources in learning *Natural and Social Sciences*. The results reveal a predominantly positive perception: 86.3% of students agreed that DLRs made lessons more interesting, while 83.1% found lessons easier to understand, and 81.3% expressed a desire to use DLRs more frequently in other subjects. These high percentages indicate that students highly value the visual and interactive elements of DLRs, which enhance engagement and comprehension. However, a small proportion of students (13.7%–18.7%) disagreed, suggesting that the effectiveness of DLRs may vary depending on accessibility, individual learning preferences, or the way teachers integrate them into lessons. Overall, the findings highlight the motivational role of DLRs in primary education and suggest the need to expand their use across different subjects.

4.5 Students' Reasons for Liking DLRs

As illustrated in Figure 5, the majority of students (91.3%) liked DLRs for vivid images and videos, followed by 84.4% who enjoyed interactive games.

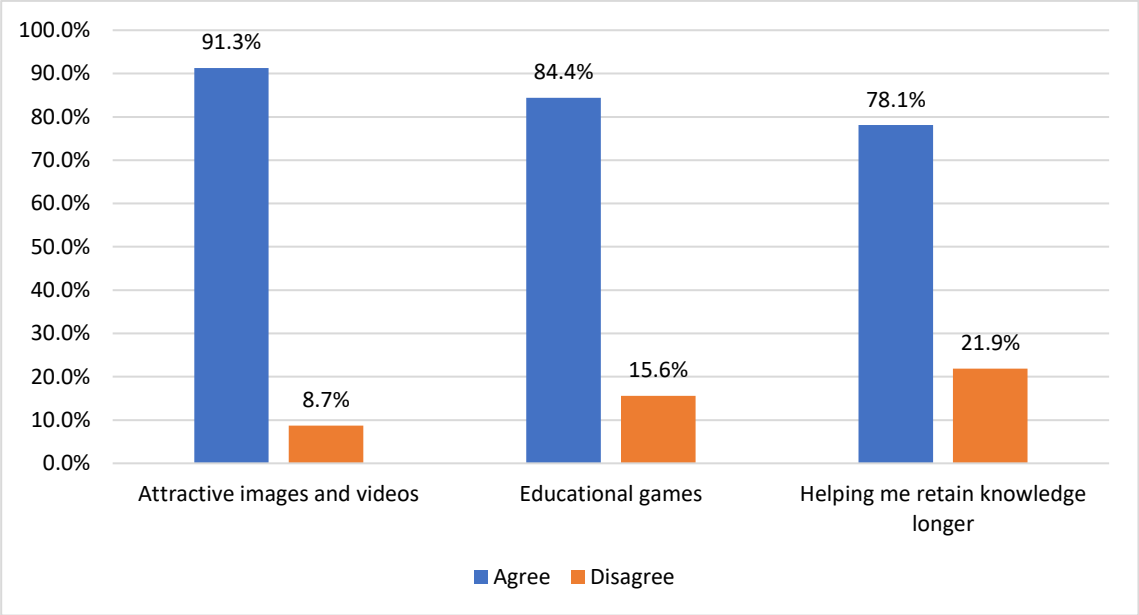

Figure 5: Reasons students like DLRs

Figure 5 presents the reasons why students liked digital learning resources. The most cited reason was the presence of attractive images and videos, agreed by 91.3% of students, showing that visual elements play a central role in drawing learners' attention. The second most popular reason was the availability of educational games **(**84.4%**),** which indicates that gamification is an effective way to enhance learning motivation. Finally, 78.1% of students reported that DLRs helped them retain knowledge longer, highlighting the positive impact of digital tools on memory and comprehension. Nevertheless, a small percentage of students (8.7%–21.9%) did not share these views, suggesting that not all learners benefit equally from multimedia and interactive content. Overall, these results underline the importance of designing DLRs with strong visual appeal, interactive features, and supportive tools for knowledge retention to maximize their effectiveness in primary education.

4.6 Students' Participation in DLR-based Activities

Participation levels were diverse. As seen in Figure 6, 71% of students frequently watched video lessons, 65% engaged in online games, while only 57% searched for additional knowledge independently.

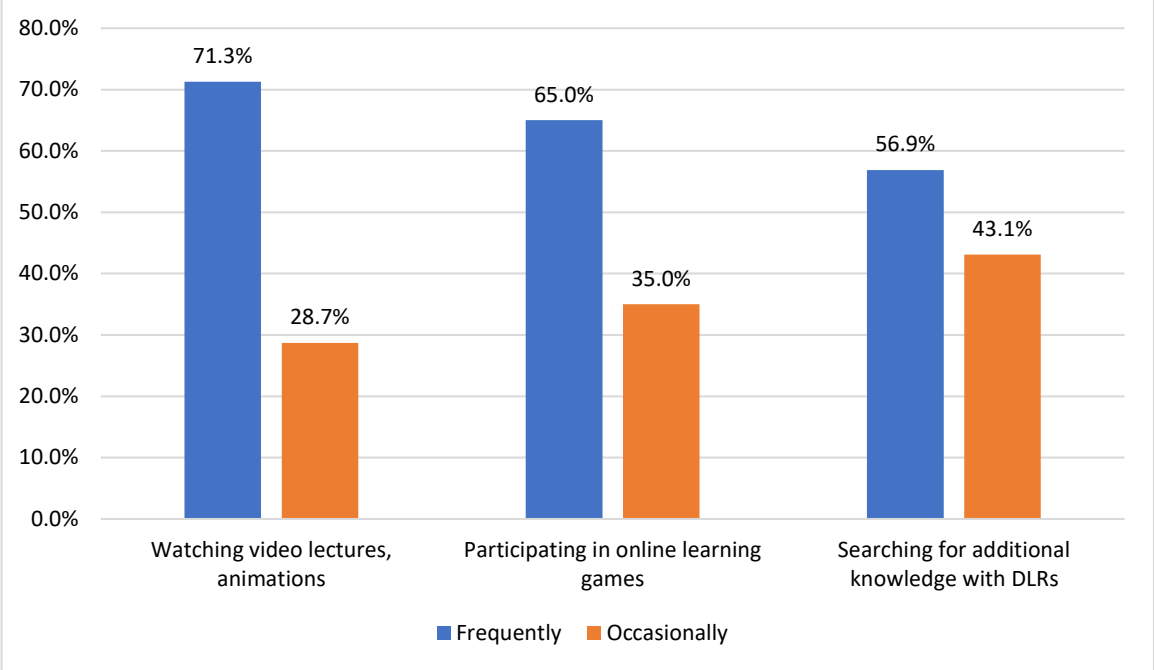

Figure 6: Students' participation in DLR-based activities

Figure 6 shows the extent to which students participated in digital learning resource-based activities. The most common activity was watching video lectures and animations, with 71.3% of students reporting frequent participation. This demonstrates that visual content is highly accessible and engaging for young learners. The second most common activity was participating in online learning games, with 65.0% of students frequently engaged, highlighting the role of gamified activities in stimulating interest. In contrast, only 56.9% of students reported frequently searching for additional knowledge through DLRs, suggesting that independent learning habits are less developed at this age. These findings indicate that while DLRs successfully engage students in teacher-led or guided activities (videos, games), further support is needed to encourage students to use DLRs proactively for self-directed learning.

4.7 Students' Challenges in Using DLRs

Figure 7 summarizes the main challenges reported by students when engaging with digital learning resources. More than half of the respondents (56.3%) indicated that they lacked personal devices and had to rely on shared family smartphones. In addition, 48.1% of students reported dependence on parental support to access or use DLRs, and 42.5% cited unstable Internet connections as a barrier to consistent learning. About 31.9% also noted difficulty in understanding or navigating interactive tools. These findings suggest that while students are highly motivated to use DLRs, structural and contextual barriers limit their independent engagement.

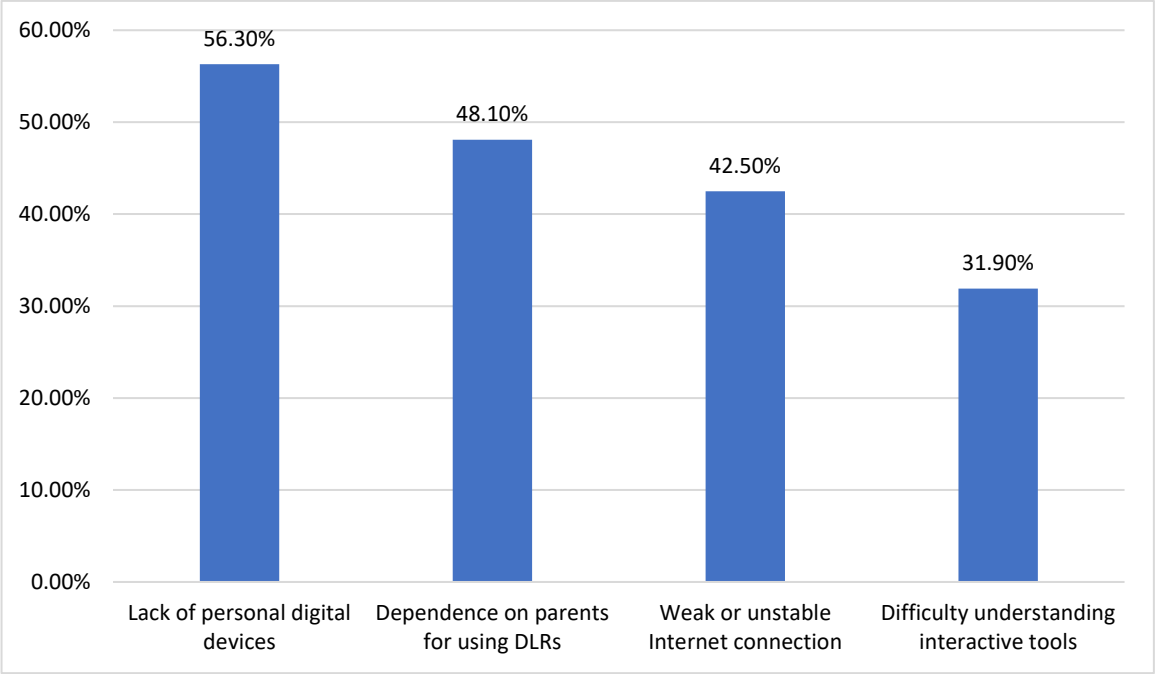

Figure 7: Students' challenges in using DLRs

Figure 7 highlights that limited access to technology and dependence on external support remain critical obstacles. This "double digital gap"—where teachers face skill and time constraints while students encounter access and connectivity issues—needs to be addressed through targeted policies and interventions.

4.8 Proposed Strategies for Using DLRs

Drawing on the survey results, several strategies are proposed to address the challenges identified among teachers and students and to enhance the use of digital learning resources in teaching *Natural and Social Sciences*:

1) Provide flexible, ready-to-use DLRs for teachers – Since 71.2% of teachers cited a lack of time, the creation of shared repositories with ready-made lesson slides, images, and videos aligned with the curriculum would reduce preparation workload.
2) Enhance teacher training on interactive design – Only 24.6% of teachers reported frequently designing interactive exercises. Training should focus on simple, user-friendly tools (Quizizz, Google Forms, Canva) that enable teachers to move beyond static presentations.
3) Invest in school-level infrastructure – With 65.3% reporting inadequate facilities and 68.6% citing lack of funding, schools need targeted support for internet access, multimedia equipment, and budget allocations for digital resources.
4) Support student access to devices – More than half of students (56.3%) lacked personal devices, and 42.5% faced unstable internet. Initiatives such as shared tablets in classrooms or local community learning hubs can ensure more equitable access.

5) Encourage independent learning activities – While 71.3% of students often watched videos, only 56.9% explored additional knowledge independently. Teachers should integrate guided self-study tasks, such as short digital quizzes or "watch-and-reflect" video assignments, to foster autonomy.

5. Discussion

The findings of this study provide a comprehensive picture of the opportunities and challenges in using digital learning resources for *Natural and Social Sciences* in primary schools in Thai Nguyen province. Both teachers and students recognized the importance and value of DLRs, but their practical use remains constrained by systemic and contextual barriers.

First, teachers' perceptions were largely positive, with over 80% acknowledging the importance of DLRs. However, their practices revealed a gap between awareness and application, as only 24.6% frequently designed interactive exercises. This gap reflects similar patterns in other contexts where teachers tend to use DLRs mainly for presentations rather than interactive learning [9], [10]. The proposed strategies to provide teacher training and ready-to-use resources directly respond to this limitation.

Second, while students expressed overwhelmingly positive attitudes toward DLRs, the data highlighted significant barriers to equitable access. More than half lacked personal devices, and 42.5% faced unstable internet connections. These results resonate with studies in Brazil and Indonesia that reported structural inequities as critical obstacles to effective use of digital tools in education [6], [10]. Therefore, strategies to improve infrastructure and provide shared devices are essential to reduce the digital divide.

Third, the relatively low percentage of students engaging in independent learning activities (56.9%) indicates that while DLRs increase classroom engagement, their role in fostering self-directed learning is limited. This is consistent with findings from Kazakhstan and Taiwan, where students benefited from DLRs in guided classroom activities but required structured scaffolding for autonomous exploration [2], [3]. Proposed strategies to design simple self-learning tasks and reflective assignments align with these insights.

In summary, the proposed strategies—curriculum alignment, interactive design, professional support for teachers, improved infrastructure, and fostering guided self-learning—are not abstract recommendations but directly grounded in the realities of teachers and students in Thai Nguyen province. The study stops at proposing feasible measures, leaving room for future research to test and validate these strategies in real classroom contexts.

6. Conclusion

This study explored teachers' and students' perceptions, practices, and challenges in using digital learning resources in teaching *Natural and Social Sciences* at the primary level in Thai Nguyen province, Vietnam. The results confirm that both groups recognize the significant value of DLRs in enhancing lesson engagement and comprehension. However, challenges such as limited time, inadequate facilities, insufficient funding, teachers' ICT skills, students' lack of personal devices, and dependence on parental support hinder effective implementation.

Based on these findings, several recommendations are proposed:

1) For policymakers and educational authorities – Invest in digital infrastructure for schools, provide stable Internet access, and establish shared repositories of ready-to-use DLRs aligned with the national curriculum.
2) For schools – Allocate funding for equipment and technical support, encourage the use of blended resources, and organize professional development workshops focused on interactive DLR design.
3) For teachers – Move beyond static presentations toward interactive learning tasks, adopt simple digital tools for quizzes and games, and integrate guided self-study activities to promote autonomy.
4) For students and families – Ensure equitable access to devices through school-based or community-based sharing initiatives, and provide parental guidance that balances support with fostering independence in digital learning.

In conclusion, this study proposes strategies to enhance the use of DLRs based on the realities of teachers and students in Thai Nguyen province. Future studies could build on these findings by implementing classroom-based trials to evaluate the effectiveness of the proposed measures.

Funding Information
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author Contributions Statement
All authors contributed to the design, data collection, analysis, and writing of the manuscript. All authors have read and approved the final version and agree to be accountable for all aspects of the work.

Conflict of Interest Statement
The authors declare no conflict of interest.

Ethical Approval and Informed Consent
The study was conducted in accordance with ethical standards in educational research. Informed consent was obtained from all participating teachers and from the parents/guardians of the student participants. Confidentiality and anonymity were strictly maintained throughout the study.

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References

[1] Ministry of Education and Training, "The General Education Program," Hanoi, Dec. 2018. Accessed: May 06, 2025. [Online]. Available: https://moet.gov.vn/content/vanban/Lists/VBPQ/Attachments/1483/vbhn-chuong-trinh-tong-the.pdf
[2] K. H. Huang, "LNCS 4564 - Integrating Digital Library Resources in Elementary School Classrooms – A Case Study of Social Study Instruction," 2007. [Online]. Available: http://www.ndap.org.tw/Introduction/
[3] Z. Yerahmetkyzy, K. Shyryn, T. Kulgildinova, A. Lazzat, A. Yerlan, and I. Ulbala, "Teaching children's literature to school children through digital educational resources," *World Journal on Educational Technology: Current Issues*, vol. 14, no. 5, pp. 1332–1342, Sep. 2022, doi: 10.18844/wjet.v14i5.8093.
[4] V. I. Marín, "Accessibility and Usability in the Development of Digital Educational Resources: The Case of MfM, a Platform for Teacher Training," *International Journal of Information and Education Technology*, vol. 15, no. 8, pp. 1547–1553, 2025, doi: 10.18178/ijiet.2025.15.8.2356.

[5] P. Sá and A. V. Rodrigues, "The DBR Potential for the Development of Digital Educational Resources for Education for Sustainability," *New Trends in Qualitative Research*, vol. 20, no. 4, p. e1122, Oct. 2024, doi: 10.36367/ntqr.20.4.2024.e1122.

[6] I. Maryani, S. Latifah, L. Fatmawati, V. Y. Erviana, and F. N. Mahmudah, "Technology Readiness and Learning Outcomes of Elementary School Students during Online Learning in the New Normal Era," *Pegem Egitim ve Ogretim Dergisi*, vol. 13, no. 2, pp. 45–49, 2023, doi: 10.47750/pegegog.13.02.06.

[7] S. Ghavifekr and W. A. W. Rosdy, "Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools," *International Journal of Research in Education and Science*, vol. 1, no. 2, p. 175, Mar. 2015, doi: 10.21890/ijres.23596.

[8] J. Knox, "What Does the 'Postdigital' Mean for Education? Three Critical Perspectives on the Digital, with Implications for Educational Research and Practice," *Postdigital Science and Education*, vol. 1, no. 2, pp. 357–370, Oct. 2019, doi: 10.1007/s42438-019-00045-y.

[9] O. Blyznyuk, "Current Experience in the Use of Digital Educational Resources: Future Primary School Teachers' Training," *Journal of Vasyl Stefanyk Precarpathian National University*, vol. 11, no. 3, pp. 91–98, Sep. 2024, doi: 10.15330/jpnu.11.3.91-98.

[10] G. M. Dos Santos, H. de C. S. Casarin, C. C. de Almeida, and M. Lucas, "Use of digital educational resources by educators in the early grades of elementary school," *Perspectivas em Ciencia da Informacao*, vol. 27, no. 2, pp. 355–376, 2022, doi: 10.1590/1981-5344/40006.