Developing an IT-based library service model to enhance learning quality

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ABSTRACT

The rapid advancement of digital technology has transformed how students access information, yet many university libraries still struggle to provide services that meet the specific needs of specialized disciplines. This study aims to develop a library service model tailored to the specific characteristics of Sports and Health Science students. The development focuses on leveraging information technology through native applications for Android and iOS. Following a 4-D research and development (R&D) framework, data were collected using three instruments: assessments from subject matter experts, media experts, and students, complemented by in-depth interviews. Quantitative data were processed using SPSS and Microsoft Excel software. Descriptive analysis was employed to outline respondent characteristics, user satisfaction levels, and overall data distribution, while inferential statistical tests, including t-tests and ANOVA, were used to identify significant differences between respondent groups. The research resulted in an IT-based library service product that achieved a high validity score of 4.72 on a 5-point scale. Validity and reliability analysis using product-moment correlation confirmed that all questionnaire items were significantly correlated with total scores ($p<0.05$). Comparative analysis before and after application implementation regarding learning quality showed significant improvements. In conclusion, the implementation of this IT-based library application is effective in enhancing learning quality.

Keywords: sports, library service model, information technology, learning quality

INTRODUCTION

Libraries have played a major role in our society as a source of many forms of knowledge and understanding. They can be more than a storehouse for knowledge and resources. They can also be places for learning, cooperation, and self-growth. In a fast-changing world, like the one we inhabit now, where everything moves so quickly, and technology is advancing so quickly, libraries need to be a home to that. Libraries must innovate and provide novel services to remain relevant to their user base and therefore their relevance (Mohideen et al., 2022; Saeidnia et al., 2023). Native apps designed to enhance library services are one area where innovation seems to be taking off. Native apps (custom apps meant for one platform, like Android or iOS) fit a user who is much better at on-the-go processes than any other type of web (Arumugam et al., 2024; Fu et al., 2025; Shah et al., 2025).

These features provide three key attributes: fast access, intuitive navigation, and responsive engagement. For library services, they are not optional enhancements but essential components for stimulating user involvement and ensuring rapid access to information. A native mobile application can streamline information seeking, improve accessibility, and enhance user satisfaction, thereby addressing existing usability problems and making users more comfortable when interacting with library resources.

According to the International Federation of Library Associations and Institutions (IFLA) data of the past few years, the integration of technology in libraries has increased significantly. Multiple studies describe a strong, global shift from traditional to digital and hybrid library models, including e-resources, digital repositories, and online services (Rafi et al., 2019; Thangavel, 2023), Big data, AI, IoT, mobile apps, and robotics are increasingly discussed as part of library infrastructures and services (Harisanty et al., 2025; Li et al., 2019). These developments led to important developments; many libraries have not yet implemented a technology that works, particularly in mobile formats. As most user's behavior is moving towards mobile, this discrepancy represents a major hurdle for libraries, as access to so much data and social services goes largely on mobile devices. Bridging this gap is critical as it will directly affect libraries' ability to keep pace with patrons' changing demands.

Beyond library-specific applications, the broader integration of e-learning in educational curricula has become a strategic step to improve the quality of education and student work readiness (Widarto et al., 2024). E-learning using modern Information and Communication Technologies (ICT) has evolved into an integral component and driving force behind teaching and learning across disciplines. These technologies enable deeper and wider learning spaces that promote higher-order thinking skills, interaction, collaboration, and reflection (Widarto et al., 2024). The convergence of library services with broader e-learning ecosystems presents opportunities for creating seamless digital learning environments that support students both inside and outside the classroom.

It could be posited that an application-based library service model might make library activities much more convenient and effective. Libraries can create apps tailor-made for students to facilitate a more interesting learning experience. Not only does this approach meet users' immediacy, but it also fosters goodwill among the library's community patrons

An efficient-development app, for instance, could allow for the borrowing and returning of books online and an electronic catalogues interface, providing an interface for the user to directly address the librarian, hence compensating for the user experience shortcomings. See, for example, the online book borrowing module: we also have one page to open up a book, users can choose any book so long as they like and get any book they request without having to visit the library (Fawwaz, 2024; Kokkula, 2025). The app allows users to get started with the app, quickly find their title, and borrow. This is especially helpful for workers, on the go, trying to have their work life and family under one roof. Native apps, eliminating accessibility and physical barriers to library access, can greatly increase the penetration of all library services and thus access to the library more broadly. One thing the automatic digital book return does for you feels like an answer to the frustration users often experience with late returns. It also alleviates concerns over overdue items because users can borrow other books if there is a limitation in the amount they can afford to pay due to late returns (Arumugam et al., 2024; Liu & Lewis, 2023).

This comforting assurance, enabled by automation in handling, not only fosters more frequent use of library resources but also fosters reading culture and lifelong learning. Personalized book recommendations for use in a native application, in addition, significantly enhance the user experience for users. Using an app like this, users can receive personal recommendations personalized by software by examining what kinds of books users borrowed previously, at what level, and for whom, and their reading choices, for each individual. For example, in this sense, a library app can provide relevant suggestions (at least personalised) to add to the user experience for the reader. This degree of personalization is viewed as indicative of the library's holdings and stimulates exploration of new kinds of materials, e.g., if patrons habitually borrow works that center on a historically significant work of fiction, the app might capitalize on those latest titles and build up their engagement with the resource to a more prominent level.

Some other features would involve opening up some discussion forums for the audiences that would have energetic pages to send or discuss a book or other subject of interest. Such interactive features may help generate enthusiasm for reading and participating in literacy and library-oriented activities by building a sense of belonging, which helps a reader, with others, assemble a community that transforms libraries from mere service providers into bustling urban

nodes of thought and dialogue. While great potential is there in the architecture of user applications for radical transformation in library services, while thoughtful focus must provide the development of them concerning what the technological capacities of the app are, as well as processes for gauging the customer needs done through extensive research efforts with an eye to how the patron behaviors/preferments are evaluated properly, with the implementation phases iteratively evolving in the process and generating functional yet appealing designs. Secondly, successful implementation is heavily dependent on stable commitments to support & maintain, Libraries must maintain a continuous upgrade agenda within each user within the app covering tech-related issue solving quickly, building on past work and building on insights while promoting ongoing improvement/satisfaction, and train/material development that familiarizes any consumer towards such solutions no matter their proficiency levels and ensures services generate the most beneficial outcomes from new initiatives introduced based on the outcomes mentioned when it comes to accessibility/diversity for all audiences served.

The native applications for enrichment of services and services in library services are huge opportunities; as a pathway to connect the already existing library services, they are the natural complement, or build upon the existing user experiences, they bring meaningful solutions and meet the customer's needs through technologies that add richness to accessibility and offer a unique experience to use as a library (such as through digital platforms) The transformative services provided through online lending and automated returns systems and customised collection suggestions and ideas offer transformative possibilities in the way that a library works, not to mention for the public, leading to an unprecedented way of serving the public by redefining and changing how library resources can engage with the public, by constantly putting the community before the library, it will lead to a more diverse world of services, where a culture of learning will reign; a world where communities are empowered to speak from experience and find learning life, helping with the enrichment of life, both of an individual and of multiple individuals.

METHOD

The method used in this research is research and development. Several types of models are used in research and development. The model used is the 4-D development model. The 4D development model (Four D) is a library service development model. The 4D model was developed by Thiagarajan et al. (1974). The 4D development model consists of four main stages: Define, Design, Develop, and Disseminate.

This method and model were chosen because they aimed to produce a library service model that accommodates the characteristics of Sports and Health Science students. The developed product was then tested for feasibility through validity and product trials to determine the extent to which library utilization by Sports and Health Science students at Universitas Negeri Yogyakarta (UNY) increased.

The development procedure is as follows: First, the define stage (front-end analysis, user analysis, task analysis, and concept analysis). Second, the design stage (criterion-test construction, media selection, format selection, and initial design). Third, the development stage (expert appraisal and development testing). Fourth, the dissemination stage, the goal of this stage is for library service products to be widely used and provide maximum benefits in accordance with the established development objectives.

The existing library service model design will be tested in three steps. First, a pilot design will be conducted to identify needs. Second, a functional design will be conducted. Third, a user experience design will focus on the user experience, including an intuitive and user-friendly interface design. Fourth, an interaction design will describe how users will interact with the system, including navigation, search, and account management.

The trial subjects in this study were divided into a limited trial and a field trial aimed at Sports and Health Science students at UNY. The limited trial involved 10 student library visitors, while the field trial involved 150 students.

The data collection technique in this study used a questionnaire, often called a survey. A questionnaire, as a data collection tool, consists of a series of written questions that must also be answered in writing by respondents. This study used three questionnaires: one for Information Technology Experts, one for Sports Experts/Library Experts/Education Experts, and one for students as library users.

FINDINGS AND DISCUSSION

Findings

This research resulted in the development of an Information Technology-based Library Service Model in the form of a native application to improve the learning quality of Sports and Health Science students at UNY. This application was designed based on the 4-D development model, which includes the stages of Define (needs definition), Design (design), Develop (development and testing), and Disseminate (dissemination). The results of the expert validation of the dissertation product, in the form of a qualitative assessment, are presented in the following Table 1.

Table 1. Expert validation results

No.	Assessment Indicators	Results Assessment	
		Average	Category
1.	The dissertation model has a real relationship	5.00	Very good
2.	The dissertation model is related to the topic	5.00	Very good
3.	The dissertation model is appropriate to the context, demands, and needs	5.00	Very good
4.	Using the dissertation model requires specific skills	5.00	Very good
5.	Using the dissertation model fosters interest	5.00	Very good
6.	The dissertation model aligns with service standards	5.00	Very good
7.	The dissertation model aligns with applicable theory	4.33	Very good
8.	There are no conceptual errors that need to be corrected in this service model	5.00	Very good
9.	The dissertation model is easy to understand	4.33	Very good
10.	The dissertation model is appropriate in the choice of font type, color, and size	4.33	Very good
11.	The dissertation model is appropriate in the choice of words	4.67	Very good
12.	There are no unclear technical terms	5.00	Very good
13.	There are no terms that need to be adjusted	5.00	Very good
14.	The method used is appropriate in conveying information	4.33	Very good
15.	The method used is effective in conveying information	4.67	Very good
16.	There is no alternative, better methods for presenting information that can be proposed	4.00	Very good
17.	The purpose of developing this service model aligns with student needs	5.00	Very good
18.	The purpose of developing this service model aligns with student expectations	5.00	Very good
19.	There are no aspects of the objectives that need to be clarified	4.33	Very good
20.	There are no aspects of the objectives that need to be added to improve the effectiveness of this service model	4.33	Very good
	Average Total Assessment Results	**4.72**	Very good

Description:
Score 1.00, 1.80 = Very Poor
Score 1.81, 2.60 = Poor
Score 2.61, 3.40 = Fair
Score 3.41, 4.20 = Good
Score 4.21, 5.00 = Very Good

Based on Table 1, the final average assessment result was 4.72 on a scale of 1 to 5, falling into the very good category. Looking at each indicator, all assessment indicators also fell into a very good category (score range 4.21 to 5.00). The responses, in the form of comments and suggestions from the experts who evaluated this dissertation product, are presented in the following Table 2.

The opinions and suggestions from the experts presented in the table above generally state that the information technology-based library service model (native application) developed in this study is adequate and ready for use in research. Several experts suggested that the questionnaire questions be more specific and tailored to the indicators to be measured, as well as using language that is easier for respondents to understand. Furthermore, it is recommended that researchers always follow developments in information and communication technology so that the application remains relevant to user needs.

Table 2. Expert responses to the information technology-based library service model (Native application)

No.	Expert	Comments and Suggestions
1.	Librarian	Overall, from a librarian's perspective, this application is very adequate. It is excellent for providing alternative services to users. It is important to always keep up with developments in information and communication technology so that the application remains relevant to students' needs in the digital age.
2.	Librarian	It is appropriate and can be immediately implemented, so that information searches in the library can be conducted using various media or platforms.
3.	Librarian	Please use it immediately for research, with the hope that service development can soon be implemented in various existing libraries. This will further increase the accessibility of information in the library.
4.	IT Expert	Can be used immediately
5.	Professor of Sports	is ready for research, with the following suggestions: - Please tailor the questions to the indicators being researched and use more specific language. - Respondents should first understand the information technology service model being developed. - Avoid interrogative sentences when making statements.
6.	Professor of Sports	is ready for research and may be used for data collection.
7.	Professor of Education	is ready for research, with the following suggestions: - The instrument is essentially complete for measuring library services. - Documenting the results from respondents is necessary to ensure compliance. - It can be used for testing the research instrument.

One expert also suggested documenting the results from respondents and using them for testing the research instrument. Overall, the experts gave a positive appreciation for the developed model and provided constructive suggestions for improving the dissertation product developed in this study, namely an information technology-based library service model in the form of a native application to improve the quality of student learning. Product user responses in a broad group trial of students, the results of the analysis are briefly presented in Figure 1.
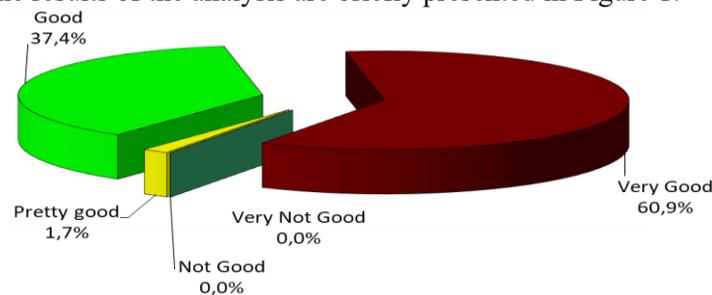
Figure 1. Student Assessment of the Final Product of the Information Technology-Based Library Service Model (Native Application)

Based on this data, the developed library service model was generally rated very well by students during field trials. This demonstrates the success of designing and developing an application that meets user needs and preferences. The interactivity and variety of content formats proved effective in enhancing student understanding and learning experiences, and overall, the application successfully achieved its objectives.

The response of students as users to the use of the final dissertation product in this extensive field test, by comparing before and after the implementation of the dissertation product, is presented in the following Table 3.

Table 3. Descriptive statistics of learning quality before and after application implementation

Score Intervals	Score Category	Before		After	
		n	%	n	%
4.21 to 5.00	Very high	11	9.6	91	79.1
3.41 to 4.20	High	73	63.5	24	20.9
2.61 to 3.40	Medium	31	27.0	0	0.0
1.81 to 2.60	Low	0	0.0	0	0.0
1.00 to 1.80	Very Low	0	0.0	0	0.0
Total		115	100.0	115	100.0

The data shown are the scores of students' assessment of the quality of learning before and after the project of the end-of-dissertation product. Student scores on 20 learning quality indicators as results before and after the implementation of the dissertation product (See Figure 2). Results after the use of the dissertation product were more favorable overall than the scores before the use of the dissertation product on all indicators. Before implementation, the average score was 3.66 (Good), and after implementation, it was 4.50 (Very Good). The increase indicates a positive impact of the implementation of the dissertation product on the quality of learning. All indicators increased, but the extent of the increase varied by indicator. Significant increases were seen in: Technology in learning (0.95-point increment), Students' comfort level at using technology (0.96-point increment), and student engagement in learning (1.02 points improvement). Higher scores in almost all indicators after the dissertation product was introduced testify to its effectiveness in advancing the quality of learning.
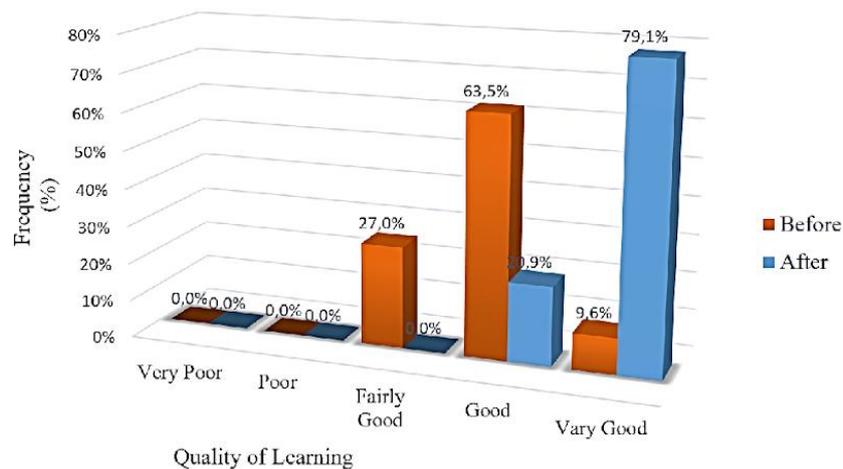
Figure 2. Learning Before and After Application Implementation

Discussion

The significant improvement in learning quality following the implementation of the IT-based library application can be attributed to several interrelated factors. First, the enhancement in indicators related to teaching methods and material delivery suggests that the application serves as a more engaging and effective pedagogical tool, rather than merely a supplementary resource.

This finding aligns with recent research indicating that web-based and mobile digital libraries that are curriculum-aligned and user-friendly are rated as highly effective in supporting learning and engagement (Fu et al., 2025; Hakiki, 2025).

The substantial increase in academic resource factor scores indicates that the digitized collections improved both accessibility and relevance of learning materials, thereby supporting more efficient information retrieval and closer alignment with course requirements. This greater ease of access and curricular fit likely helped students engage more deeply with the content and enhanced their comprehension of the curriculum. These improvements are consistent with studies showing that digital and ICT-based library services are consistently linked to improved academic access, user satisfaction, and perceived impact on academic performance, largely through better resource availability and ease of use (Faizan & Munshi, 2025). Furthermore, research on online library resources confirms that accessibility, usability, and good alignment with course needs are central to positive learning experiences and outcomes (Zarar et al., 2023). These improvements in access, relevance, and usability of resources translate into higher overall learning quality, as students can obtain, understand, and apply course materials more effectively (Hakiki, 2025).

Second, the marked improvement in technology-related indicators, particularly in students' comfort and use of technology for learning, confirms the application's effectiveness in integrating digital tools into the educational process. This finding aligns with the study's objective to leverage IT for pedagogical advancement. Furthermore, the notable increase in student engagement and lecturer-student interaction points to the application's role in fostering a more interactive and communicative learning environment, providing students with greater opportunities for feedback and inquiry. While these results strongly suggest that the developed product is suitable for broader implementation, they should be interpreted with consideration of the study's scope. Further research is necessary to explore the underlying mechanisms driving these improvements in greater depth and to assess the long-term sustainability and impact of this library service model on learning outcomes. A primary finding of this study is that the students' involvement in learning increased, as observed in increasing mean scores, such as in enthusiasm and active participation in the discussion or learning motivation.

This is a remarkable result, because student engagement is usually a great indication of learning. Within this scope, the general enthusiasm of the students is seen as an early indicator of their interest and desire towards furthering the process of learning. Such as, for instance, the students who have a lot of interest in one topic are the most likely to help the students involved in the discussion in-class and also on the application's digital platform. This user-acquisition application demonstrated success in enhancing student concept understanding in this study.

For example, a rise in average marks is reflected by the rising average scores toward both signs of mastery of concepts and explanation of material. For instance, even though a student once had difficulty presenting basic concepts in sports science, this is now done so confidently with the application (Cena et al., 2025). Such applications not only help with better and more effective access to information but also provide interactive modules to support and enhance learning with quizzes, knowledge videos, and discussion posts (Cena et al., 2025; Goode et al., 2022). The improved conceptual understanding observed in this study has particular significance for Sports and Health Science students, whose curriculum integrates theoretical knowledge with practical physical competencies. Khairuddin et al. (2023) demonstrated that physical fitness improvements in students are closely linked to their understanding of movement principles, exercise physiology, and training methods. In their study, students who received game modification approaches in physical education showed significant increases in physical fitness scores (from 14.72 to 18.26, $p<0.05$), with components including cardiovascular-respiratory endurance, speed, strength, explosive power, and flexibility (Khairuddin et al., 2023). The IT-based library application developed in the present study supports this practical domain by providing access to digital resources that explain the scientific basis of these fitness components. Students can access video demonstrations of proper exercise techniques, read about the physiological mechanisms underlying different training methods, and explore evidence-based approaches to health promotion. This integration of digital resources with practical physical education creates a

comprehensive learning ecosystem where theoretical understanding enhances practical application, and practical experience deepens conceptual grasp.

In this way, the students do not merely consume knowledge but are active participants in the building of knowledge. The application is also helpful in enhancing students' digital competencies. Especially with information technology skills essential in modern times, this app can be a good way to practice these skills. For instance, those students who apply the app for information and group work should be able to implement other digital tools that facilitate learning. This not only helps them in their existing studies, but they are prepared to work in an environment that uses technology for ever more (Smith et al., 2020; Torbaghan et al., 2023).

Beyond the quantitative improvements in learning indicators, qualitative insights from users provided valuable perspectives on the application's effectiveness. The feedback received, particularly from students, indicates a positive response to the application and its development. Students described the application as user-friendly, educational, and useful for supporting their learning. This positive response shows that the application successfully meets students' needs and expectations as end-users. Moreover, student feedback plays an important role in the ongoing improvement and refinement of the application.

The emphasis on user-friendliness as a key factor in student satisfaction reflects broader patterns in educational technology adoption. Research on online learning implementation has consistently shown that platform usability significantly influences user engagement and learning outcomes. A survey by Widarto et al. (2024) on vocational schoolteachers revealed that WhatsApp was the most widely used platform for online learning, utilized by 104 out of 118 teachers, followed by Google Meet and Zoom for video conferencing. Interestingly, Learning Management Systems (LMS) such as Edmodo and Google Classroom were the least utilized platforms, despite being specifically designed for learning management. Teachers considered LMS complicated compared to other platforms, requiring adequate digital literacy and greater effort to learn (Widarto et al., 2024). This finding aligns with the present study, where students reported ease of use as a key factor in their positive response to the native application. The success of technology-based learning tools, whether for library services or classroom instruction, appears to depend significantly on intuitive design and minimal learning curves, rather than on sophisticated features alone.

This preference for simplicity, however, does not preclude the desire for enhanced functionality. Students in the present study expressed interest in additional features. If students wish to add further features to the application, such as video tutorials or live Q&A sessions with lecturers, developers can use this feedback to iteratively enhance the user experience. Research on technology-supported feedback and video tools in higher education shows that students value personalised, multimedia support and often prefer it to traditional text-only resources (Gould & Day, 2025; Park, 2025). These findings are consistent with the study by Zhang et al. (2023), who explored the use of technology to improve health science library services in China. Similar work on Chinese university libraries shows that digital tools and electronic information systems can expand access to information and enhance service quality for users (Peng & Zhang, 2019; Zhao et al., 2019). In this sense, the implications of the present study are practical: they offer concrete suggestions for health science library managers on how user-centred, technology-based applications can be leveraged to improve service delivery and better meet users' information needs.

This research may guide national library development policies that resonate with the study objective to leverage apps for improved learning quality. The study and Zhang et al.'s (2023) studies are relevant and reinforce the findings. Though the focus of the studies may differ (learning apps vs library development), both stress the importance of technology in improving access to information and learning quality. Zhang et al. (2023) provides an international context demonstrating that the implementation of technology to improve access and quality in learning is a global issue requiring attention. This highlights that this study is not only domestically relevant but also has global significance.

Despite these promising findings, several limitations must be acknowledged when interpreting the results. First, the study sample was confined to Sports and Health Science students

at a single institution (Universitas Negeri Yogyakarta), which limits the generalizability of the findings to other disciplines or university contexts. Second, the relatively short duration of the implementation period may have constrained the depth of observable outcomes. A longer-term study would be necessary to assess the sustainability of the application's impact on student engagement and learning over time, as well as its scalability across different educational settings.

A longer study, which might have been extended with a longer observational period, might have been able to reveal the effect of app applications on learning. Gaining a longer-term perspective of how student engagement and learning have changed over time might also allow researchers to assess the long-term sustainability of the impact of the app. The results of this project suggest that the adoption of a native mobile application library service model results in improved learning quality of Sports and Health Science students. Future studies involving larger and more diverse samples could further validate the positive effects observed across multiple indicators, including student engagement, conceptual understanding, and technology integration.

The findings support the notion that mobile library services are not just used as access utilities but also active learning facilitators. Enhancing student engagement as a result of applying the app is indicative of mobile access transforming lessons and curriculum delivery to be more flexible and student centred. This result is in line with previous studies that demonstrated that mobile learning platforms support motivation and participation, as students' access to resources according to their unique learning profiles can strengthen motivation (Booton et al., 2023; Johannsen et al., 2023).

The student-centered nature of the IT-based library application aligns with pedagogical approaches that emphasize active knowledge construction rather than passive information consumption. Chusni et al. (2022) demonstrated that discovery-based multiple representation learning (DMRL) significantly improves students' critical thinking skills by engaging them in scientific inquiry processes. Their study, involving 162 seventh-grade students with varying academic achievement levels (high, middle, and low), showed that the DMRL model, which includes phases of orientation, simulation-based multiple representations, problem identification, exploration, data literacy, presentation and verification, and evaluation, was effective in closing critical thinking skill gaps between high-achieving and low-achieving students (Chusni et al., 2022). The scaffolding process through peer tutoring among group members with heterogeneous academic levels allowed higher-achieving students to guide middle and lower-achieving peers, helping them reach their Zone of Proximal Development (Chusni et al., 2022). This finding has direct implications for the present study, as the library application's interactive features, including discussion forums, collaborative resource sharing, and personalized recommendations, create similar opportunities for peer learning and scaffolding. Students who might struggle with complex concepts in sports and health sciences can benefit from explanations and resource recommendations from more knowledgeable peers, facilitated through the application's social features. Moreover, the multiple representation formats available in the digital library, including text, images, videos, and interactive modules, support diverse learning styles and help students construct more robust mental models of scientific concepts (Chusni et al., 2022).

The use of resources on the web with a native app seems to eliminate time and place-related challenges that are essential to learning continuously. It proves that the educational value of the application developed further is an improvement in conceptual understanding. More easily accessible digital collections and learning resources can facilitate independent learning and deepen engagement in course content. Previous studies have also documented similar findings, emphasizing the importance of digital library services in enhancing academic performance and self-regulation of learning (Ocran et al., 2020). A related finding is that students' digital competence increases. Navigating and utilizing digital library services is gaining importance in higher education, especially in technology-assisted fields of study.

Based on existing research, which shows that good mobile applications enhance learning effectiveness as well as the development of digital skills (Faudzi et al., 2024), findings presented in this study coincide with those observed in prior research. This study, therefore, has an empirical foundation and offers some discipline-specific evidence compared with its predecessors, studying digital library services generally. The findings from our study focusing on Sport/Health Science

students illustrate the necessity for library service design to be adapted to the unique learning contexts present in various disciplines. However, the study is confined to a single institution, and the period of implementation is rather short. Future studies with more institutions and longer time frames for observation are expected to identify the long-term influence and scalability of the proposed model.

CONCLUSION

It is an ingenious method to overcome the challenges in accessing information and encourage engagement among learners. Validation by experts yielded a very good rating, which demonstrated the applicability of the application to users' requirements and expectations. Field trials revealed that learning in a variety of areas improved substantially after application deployment in the classroom context, including conceptual understanding, learning motivation, and student and teacher interaction. Students evaluated the ease of access to information, intuitive and interactive content, which improved the learning experience (U-interactive). Youth Sports and Health Science students at UNY found the information easy accessibility, user friendly interface, and interaction that made learning easy to experience. The user experience reports are full of enthusiasm for this application, and their satisfaction is also high. Changes and refinements following expert advice and field testing have created a more effective, practical application. This native application is an innovative and effective solution for increasing the quality of academic learning for students. The native application as a dissertation product has proven helpful and effective in improving the quality of experience to increase learning quality to Sports and Health Science students at UNY by 22.95%, this shows a great positive difference.

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