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Development of Web-Based Educational Media for Recording and Reporting Midwifery Documentation

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ABSTRACT: Documentation of midwifery care is essential because it significantly influences the quality, accountability, and continuity of care. Documentation can be paper-based or managed through electronic systems, such as electronic health records. With the introduction of web-based electronic documentation, midwives are expected to enhance their documentation competencies to effectively utilize electronic systems. This study aimed to develop and evaluate the feasibility of a web-based educational application for recording and reporting midwifery documentation to support learning processes in professional midwifery education. This research employed a research and development (R&D) design using the Borg and Gall development model. Data were collected using a Likert scale and subsequently converted into percentages for analysis. The developed web-based application, Task Bidan, was found to be feasible after undergoing a series of evaluations. Expert validation resulted in a feasibility score of 77.2%, which was classified as moderate, indicating that revisions are required. Individual trials yielded a higher feasibility score of 82.25%, categorized as good. Subsequent revisions improved the overall usability and learning support of the application. The result of the trial and revision phases is a revised version of the web-based midwifery documentation recording and reporting application (second revision stage). The final version of the Task Bidan application was deemed feasible for implementation in professional midwifery education. The application has the potential to enhance students' electronic documentation competencies and support digital learning in midwifery education.

KEYWORDS: Web-based learning, educational technology, research and development

I. INTRODUCTION

Documentation of midwifery care is a fundamental component in midwifery practice because it serves as the basis for professional, ethical, and legal accountability for the services provided to clients. Systematic recording and reporting allow midwives to track the care process, evaluate service outcomes, and ensure continuity and patient safety. In addition, obstetric documentation acts as a media of information about the client's health status, a means of communication between health workers, and a source of data for audits, quality evaluation, and the development of evidence-based practices (1,2).

In general, health documentation can be done in paper-based or electronic-based (3). Although paper-based documentation is still widely used and has several advantages, such as ease of access without reliance on digital systems, this method has significant limitations. Problems that often arise include illegible handwriting, incomplete data, information fragmentation, delays in data access, and a high risk of loss or damage to documents. In the long run, paper-based documentation has also been shown to require greater time and cost for the maintenance and management of archives (4).

The development of information technology in the last two decades has driven the transformation of health documentation towards electronic systems, including in obstetric practice. Evaluation of the condition of conventional documentation is an important first step in the transition process to more standardized and integrated electronic documentation (5). Studies have shown that electronic documentation can improve readability, data consistency, work efficiency, and support clinical decision-making and data-driven education (6,7). Along with the implementation of web-based obstetric documentation, midwifery personnel are required to have competence not only in clinical care, but also in the effective and responsible use of digital documentation systems.

In the field of education, the change in learning paradigm is significantly influenced by globalization and the advancement of digital technology. Health education, including midwifery education, is undergoing a shift from conventional approaches to more open, flexible, and technology-based learning (8,9). The integration of digital technology in the learning process not only aims to

improve efficiency, but also to prepare students to face the demands of professional practice in the era of digital health systems. Therefore, the development of web-based learning media specifically designed to train midwifery documentation skills becomes relevant and strategic in the context of midwifery professional education.

II. METHOD

This study employed a research and development (R&D) approach in the field of education, which aims to develop a web-based application for recording and reporting obstetric documentation. The application development process follows the Borg and Gall model, which consists of ten stages, namely: information collection and preliminary study, planning, development of initial product forms, initial field trials, major product revisions, main field trials, operational product revisions, operational field trials, final product revisions, and dissemination and implementation (10). These stages were carried out systematically and sequentially to ensure that the products developed are in accordance with the educational needs of the midwifery profession.

Data collection was carried out at the validation and product trial stages using a Likert scale questionnaire to assess the feasibility of the application from various aspects. The data obtained was then converted into percentage form and interpreted using a five-level achievement scale, namely excellent, good, adequate, lacking, and very poor. This eligibility category is used as a basis for decision-making in the revision and refinement process of the application at each stage of development.

Table 1. The Conversion of the five's scale achievement level

Achievement Levels (%)	Qualification	Information
90-100	Excellent	Not revised
80-89	Good	Not revised
65-79	Moderate	Revised
55-64	Less	Revised
0-54	Poor	Revised

III. RESULTS AND DISCUSSION

The development of a web-based midwifery documentation recording and reporting application (Task Bidan) began with the information collection stage to identify potential and problems in the midwifery documentation learning process. The results of observations on midwifery professional education revealed that recording and reporting activities were still predominantly paper based, which poses various obstacles, such as the use of large amounts of paper, the risk of loss or damage to documents, limited data accessibility, and the burden of student mobility during clinical practice. In addition, the use of physical documents also has the potential to increase the risk of transmission of infectious agents between students, patients, preceptors, and lecturers. These findings are in line with the literature that paper-based documentation tends to be less efficient and risks lowering the quality of clinical information management and learning, where manual methods have been shown to contribute to human errors due to high administrative burdens (11,12). Based on the results of the identification, the planning stage was carried out through interviews with midwifery professional education lecturers and students as well as direct observation of the documentation reporting flow. This process resulted in a rearrangement of the recording format and reporting flow of obstetric documentation to be more systematic and in accordance with the learning needs and clinical practice. This stage is important because the analysis of user needs is the main foundation in the development of technology-based learning media in health education (13).

The product design stage generated the initial prototype design of the Task Bidan application, which includes the preparation of use case diagrams, flowcharts, data flow diagrams (DFDs), entity relationship diagrams (ERDs), interface design, databases, and web-based application implementation. The workflow of the Task Bidan application is presented in Figure 1, which describes the application usage process starting from user login, menu selection based on roles (students, lecturers, preceptors, and coordinators), to the process of recording, reporting, evaluating, and storing obstetric documentation. The presentation of the flowchart in the results section is intended to provide a concrete overview of the integration of the development stages with the functional implementation of the application in the context of midwifery learning. Visualization of system flows like this is considered important in development studies because it helps readers understand the relationship between system design and the learning objectives to be achieved (14,15).

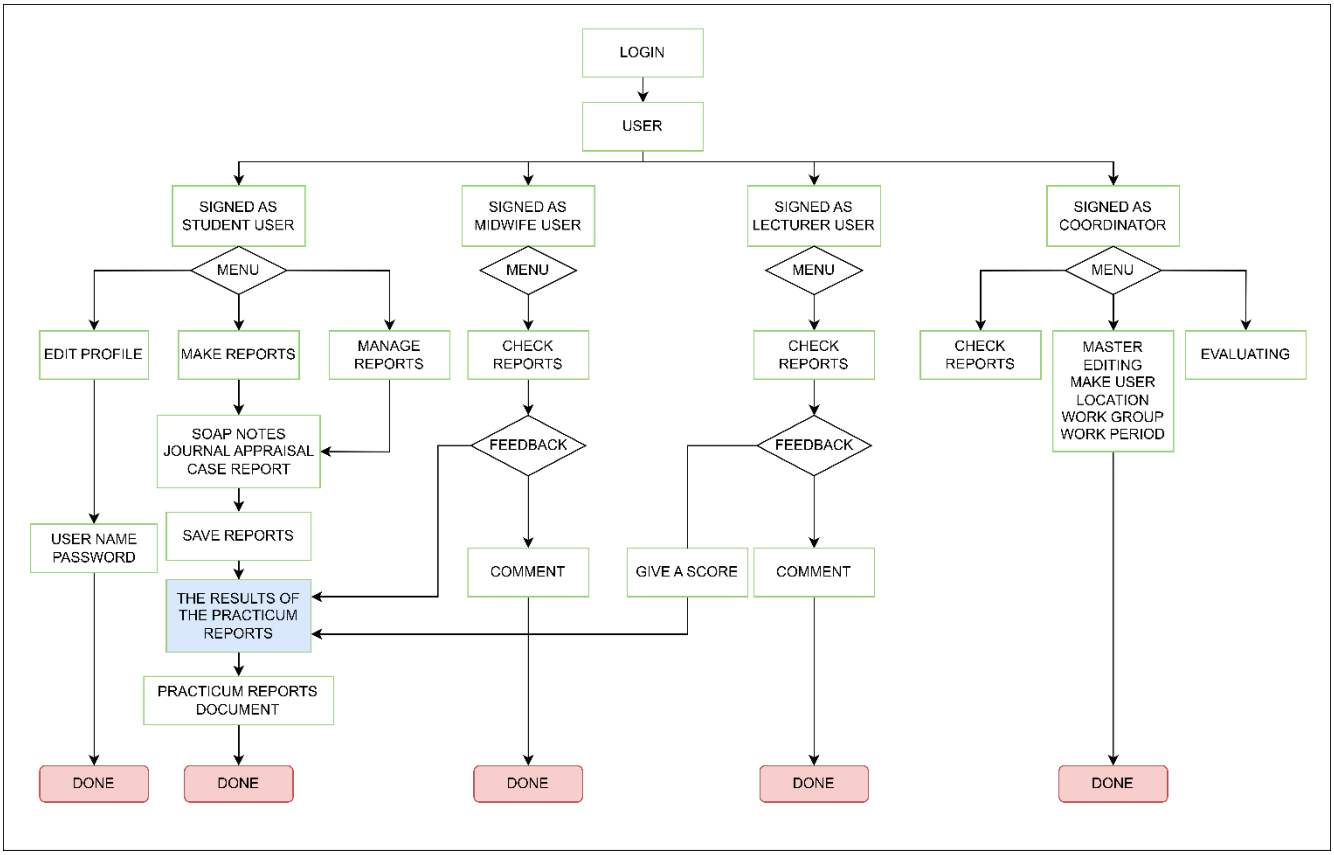


Figure 1 Work Flow Diagram

Preliminary Field Test (Design Validation Stage)

The design validation stage was carried out through an initial field trial involving lectures in professional midwifery education as experts, using purposive sampling techniques. The results of the expert validation assessment are presented in Table 2, shows an overall feasibility score of 77.2%, which is included in the moderate category, so product revision is a required. Some aspects that scored relatively lower were navigation and layout, which indicated the need for improvements in ease of use and clarity of display. Formative evaluation at this stage plays an important role in ensuring that digital learning media not only functions technically, but also supports the user's learning experience optimally (16).

Table 2. Results of expert validation of the Task Bidan application

No	Aspects	Score
1	Accessibility	75
2	Identity	90
3	Navigation	70
4	Fill	75
5	Text	80
6	Color	80
7	Grammar	80
8	Layout	70
9	Interactivity	75
Final Result		77,2

Main Product Revision (Design Revision Stage)

Product revisions were carried out based on expert feedback, which included improvement of assessment instruments, revision of feature descriptions, the addition of report outputs in PDF format, font and font size settings, and optimization of working group divisions and practice periods. Following these revisions, the application was tested through individual trials. The results of the individual trials, as shown in Table 3, showed an increase in the eligibility score to 82.25%, which fell into the good category.

This improvement indicates that the improvements made have succeeded in improving the aspects of functionality, ease of use, and application support for the midwifery documentation learning process.

Table 3. Results of individual trial evaluation of the Task Bidan application

No	Aspects	Score
1	Text and Language	75
2	Display	75
3	Use	94
4	Learning	85
Final Result		82,25

Usage Trial Phase

The trial stage was conducted involving lecturers, students, and clinical preceptors with a total of 53 users. The results of the assessment at this stage are presented in Table 4, with a feasibility score of 87%, which fell within the good category. This score reflects higher user acceptance rates when the application are used in the context of learning and practice more broadly. Users consider that the Task Bidan application simplifies the process of recording and reporting midwifery documentation, improves data organization, and supports the supervision and evaluation process by lecturers and clinical preceptors. However, limitations related to the need for a stable internet connection remain an important consideration, as commonly reported in the implementation of web-based learning media in health education (17,18).

Table 4. Results of field trial evaluation of the Task Bidan application

No	Aspects	Score
1	Text and Language	85
2	Display	84
3	Use	94
4	Learning	85
Final Result		87

Final Product

The individual trial phase achieved an excellent rating. Participants reported that the application had an attractive interface, was easy to operate, and facilitated the creation of midwifery documentation reports. The primary concern raised by respondents was the need for a stable internet connection to access the Task Bidan application.

Dissemination and Implementation

The Task Bidan application for recording and reporting midwifery documentation was declared feasible for implementation after undergoing a series of field trials. The final product facilitates students in preparing midwifery documentation reports through customized and role-based features.

Features available to midwifery students include creating, editing, deleting, and printing documentation reports. Clinical lecturers and preceptors are able to view and print reports, as well as provide assessments and feedback on each student's submission. Meanwhile, coordinators have access to features for assigning users to workgroups, managing workgroup periods, and evaluating the achievement of targeted midwifery case requirements.

IV. CONCLUSIONS

This study demonstrates that the web-based midwifery documentation recording and reporting application, Task Bidan, was successfully developed using a research and development approach based on the Borg and Gall model and is suitable for implementation in professional midwifery education. The staged development process enabled continuous refinement of the application based on validation results and user trial feedback.

The evaluation findings indicated an increase in feasibility levels following revisions, reflecting improvements in functionality, usability, and support for the learning process. Overall, the Task Bidan application has strong potential to enhance students' electronic documentation competencies as part of their professional readiness in the era of digital health systems.

It is recommended that the Task Bidan application be implemented more widely within professional midwifery education as a supportive medium for electronic documentation training. Future research should examine the effectiveness of the application in

improving student competencies using experimental or quasi-experimental research designs. Additionally, further development may focus on expanding system features and enhancing system stability to support sustainable, long-term implementation.

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