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Forms and Field Trials of a Digital Evaluation Tool: Integrating F-S Model, WP Method, and Balinese Local Wisdom for Effective E-Learning

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Abstract

This study purposed to show the tool display and the results of field trials on the digital evaluation tool. This tool is an evaluation tool in digital format which was from a combination of the concept of the educational evaluation model "F-S (Formative-Summative)", the decision support system method "WP (Weighted Product)", and Balinese local wisdom "TP (Tri Pramana)". The importance of combining these concepts and methods is it makes it easier to obtain accurate calculation results following the needs of evaluation tools to determine the dominant aspects determining the effectiveness of e-learning. This research approach was development research. The development model was Borg and Gall, which focused on the field trial and field trial revision stages. The reason for focusing on those two stages was that we wanted to know how effective the evaluation tool was in getting the dominant aspects determining the effectiveness of e-learning. The research location was at several health colleges in Bali. Field trials data collection was using a measuring instrument in the form of a questionnaire. The respondents who were involved in conducting field trials were 54 people. Data analysis on the results of field trials was comparing the results of field trials with the standard effectiveness of five's scale. The results of this study show that the appearance of the digital evaluation tool and the percentage of its effectiveness through field trials was 81.73%, so the tool was categorized as good. The impact of this research on informatics observers/informatics experts is that they will know an innovative evaluation tool used to determine the dominant aspect determining the effectiveness of e-learning based on decision support system methods and Balinese local wisdom.

Keywords: Formative-summative, Weighted product, Evaluation, Tool, Tri pramana

1. Introduction

Information technology-based learning models are notable in supporting the smooth learning process [1], [2], [3]. It is especially when the Covid-19 pandemic hit the world. Information technology-based learning models were the most appropriate alternative to minimize crowds caused by face-to-face learning in class [4], [5], [6]. One of the most commonly known and easy-to-use information technology-based learning models is e-learning [7], [8], [9], [10]. Many free software and platforms are scattered on the internet that can support the realization of e-learning. However, not all free tools or software can support effective e-learning. The effectiveness of e-learning is not only determined by the existence of a platform or software used in realizing e-learning [11], [12], [13], [14], [15]. However, there are also several other aspects, including the ability of human resources to organize e-learning, e-learning business processes, data security guarantees in e-learning, and others. Based on these conditions, it is necessary to carry out an evaluation to determine the dominant aspects that determine the effectiveness of e-learning in terms of readiness to implement e-learning starting from the beginning of learning until the learning process is complete.

This need encourages the emergence of innovations in the form of digital format evaluation tools. This digital evaluation tool is called the WP-TP-based F-S evaluation tool. This digital evaluation tool was from a combination of

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the F-S (Formative-Summative) evaluation model, the WP (Weighted Product) method, and the concept of Balinese local wisdom called TP (Tri Pramana). The Formative-Summative model is an evaluation model that is carried out from start to finish to find out how successful a designed program can be [16]. This evaluation model begins when the policy, program, or project begins to be implemented (formative evaluation) and until the end of program implementation (summative evaluation) [17]. The WP method is a method in decision support systems that uses multiplication to connect attribute ratings, where the rating of each attribute must first be raised to the power of the attribute weight [18], [19], [20]. Tri Pramana is three ways to gain knowledge. Tri Pramana consists of three parts, including Pratyaksa-Pramana, Anumana-Pramana, and Agama-Pramana [21]. Pratyaksa-Pramana means gaining knowledge by seeing directly, Anumana-Pramana means gaining knowledge by taking conclusions from analysis and Agama-Pramana means gaining knowledge by believing in the statements of holy people who never lie [22]. The combination of the F-S evaluation model and the TP concept is a basis for determining alternative aspects that determine the effectiveness of e-learning. The WP method is a basis for numerations in determining the most dominant aspect that determines the effectiveness of e-learning.

Limitations previously found in other studies became the basis for the emergence of this innovation in the form of digital evaluation tool. Research Dakir et al. [23] showed the existence of digital applications which have usefulness in assessing a learning process. Research limitations Dakir et al. are that the application cannot show the results of the process assessment from the beginning to the end of learning, but only the assessment at the end. Research by Darmawan et al. [24] showed the use of Quizizz as a tool for assessing learning outcomes. Limitations of research Darmawan et al. are that the Quizizz application cannot indicate an assessment of student learning outcomes in the cognitive, affective, and psychomotor domains. However, it was only limited to the cognitive domain. And its assessment only can be done at the end of the learning process. Research by Schellekens et al. [25] showed the existence of digital applications to assess the quality of assessment programs in tertiary institutions. The limitation of Schellekens et al. is that the application cannot indicate the dominant aspects that most trigger the quality of the assessment program in tertiary institutions. Rerung & Hartono's research [26] shows digital applications to assess students' language skills. The limitation of Rerung & Hartono's study was that digital applications were incapable of assess students' language skills as a whole from the beginning to the end of the learning process. Research by Rinaldi et al. [27] showed the Google form as a digital assessment tool to measure students' vocabulary mastery abilities. Research limitations Rinaldi et al. are only able to assess students' abilities in the cognitive domain and are not yet thorough in the affective and psychomotor domains. Prasetya's research [28] shows the use of digital assessment in LMS Moodle and Google Classroom for English subjects. The limitation of Prasetya's study was that it did not show a comprehensive cognitive, affective, and psychomotor assessment from the beginning to the end of the learning process. This digital evaluation tool can undoubtedly fill the gaps/limitations of Dakir et al.'s research, Schellekens et al.'s research, Rerung & Hartono's previous research. This is conducted by accurately showing the dominant aspects determining the effectiveness of e-learning in terms of readiness to implement e-learning starting from the beginning of learning until the learning process is complete. This digital evaluation tool can also accurately show the dominant aspects determining the effectiveness of e-learning in terms of comprehensive cognitive, affective, and psychomotor assessment readiness from the beginning to the end of the learning process.

Referring to the innovations and some of the limitations of previous studies that prompted the emergence of this research, there was one research question. It was "How does the digital evaluation tool display, and results of its field trials?" Based on the research question, the main objective of this research is to find out the appearance of the tool and the results of field trials on the WP-TP-based F-S evaluation tool.

2. Method

2.1. Research Approach

This research is development research using the Borg and Gall model. The Borg and Gall model has several stages of development [29], [30], [31], [32], [33], [34], including: 1) research and field data collection; 2) planning; 3) design development; 4) initial trials; 5) revisions to the results of the initial trials; 6) field trials; 7) revision of the results of the field trials; 8) usage trials; 9) final product revisions; and 10) dissemination and implementation of the final product. Specifically for the 2023 research, development was focused only on the field trials phase and field trials

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revision phase. It was done to suit the objectives of this study. At the field trials stage, testing of the digital evaluation tool was carried out involving 54 respondents. The 54 respondents provided perception scores on 15 questions related to the digital evaluation tool. At the revision stage of the field trial results, improvements were made to the digital evaluation tool. These improvements were made based on several suggestions given by the 54 respondents after conducting field trials.

2.2. Subjects, Object, and Location of Research

The number of subjects involved in the field trials of the WP-TP-based F-S evaluation tool was 54 people, including two educational experts, two informatics experts, 40 lecturers, and ten evaluators. This subject selection was carried out using a purposive sampling technique. The selected subjects are subjects who really have an interest and aim to understand in depth the object being studied [35], [36], [37]. Therefore, selecting subjects using a purposive sampling technique can represent the target population of digital evaluation tool users. The two education experts have qualifications in informatics education and educational evaluation. The two informatics experts have qualifications in artificial intelligence and information systems. The lecturers involved came from several health colleges in Bali. The evaluators involved have qualifications in educational evaluation and informatics education.

The object of this research was the WP-TP-based F-S evaluation tool. This research object was very important and urgent to research. It followed the topic and research question to be answered and has novelty for the development of the field of educational evaluation. The research location was at several health colleges spread across six districts in Bali. The six districts include Tabanan, Gianyar, Klungkung, Buleleng, Badung, and Denpasar. The reason for carrying out research at several health colleges in Bali was to find out the dominant aspects determining the effectiveness of implementing e-learning, especially at health colleges.

2.3. Data Collection Instruments

Instruments used in collecting data in this study were questionnaires and photo documentation. It used questionnaires to obtain primary data. It was quantitative data from respondents as a basis for making decisions about the effectiveness percentage of the field trials on the digital evaluation tool. It used photo documentation as proof that this study was indeed carried out and also used as valid evidence that showed the source of primary and secondary data obtained in this study.

2.4. Data Analysis Techniques

The technique used to analyze the data was a quantitative descriptive technique through calculations of effectiveness percentage. Data obtained from data collection using questionnaires in field trials was processed into a percentage of effectiveness. The effectiveness percentage results are then compared with the categorization standard which refers to five's scale. Based on the results of this comparison, it can later be interpreted to obtain the status of categorizing the effectiveness of the digital evaluation tool and its follow-up actions. Calculations to get the percentage of effectiveness can use equation (1) [38], [39]. The categorization standards referring to five's scale can be seen in table 1 [40], [41], [42].

$$P= (f \times N-1) \times 100\% \quad (1)$$

Notes:

f = Total acquisition value; N = maximum total value.

Table 1. Categorization Standards Referring to Five's Scale

Percentage of Effectiveness (%)	Category of Effectiveness	Follow-up
0-54	Poor	Revision
55-64	Less	Revision
65-79	Moderate	Revision
80-89	Good	No Revision
90-100	Excellence	No Revision

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3. Result and Discussion

3.1. Results

Several research results were obtained related to the tool display, the results of field trials, and revisions. The appearance of the WP-TP-based F-S evaluation tool can be seen in full in figure 1 to 7. The results of the field trials can be seen in table 2, and the revised results can be seen in figures 9 to 11.

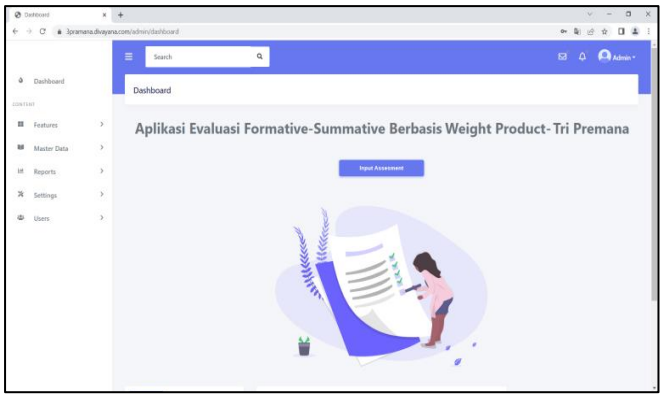

Figure 1. Main Menu Display (in Bahasa)

Figure 1 shows the main menu display of the digital evaluation tool. There are five menus in this tool, including: features menu, master data, reports, settings, and users. These menus become a link to other forms in the digital evaluation tool.

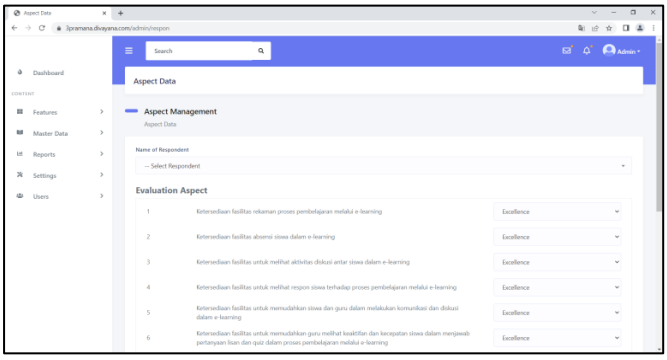

Figure 2. Display Form for Input Evaluation Aspects (in Bahasa)

Figure 2 shows the display of the form to facilitate input of evaluation aspects. The evaluation aspects entered into the form are based on the formative-summative evaluation components. In this form, several combo-boxes contain the significance rating values for each evaluation aspect.

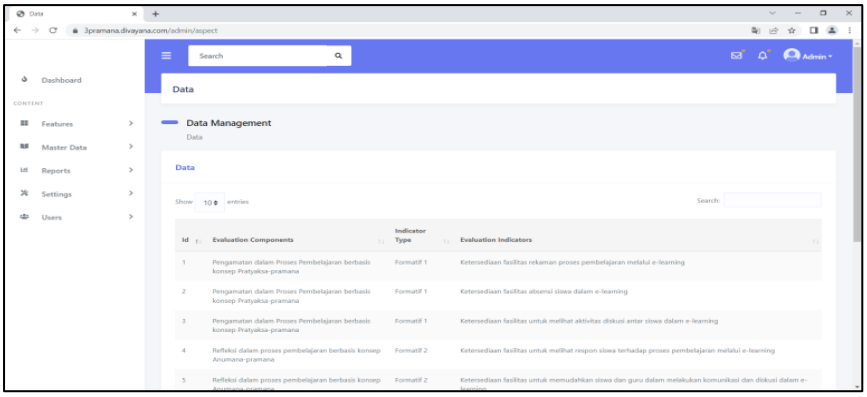

Figure 3. Display Form for Component Input and Evaluation Indicators (in Bahasa)

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Figure 3 shows the display of the form to facilitate input of evaluation components and evaluation indicators/aspects. The evaluation components and indicators in this form are recorded in one table. The table consists of several fields, including id, evaluation components, indicator type, and evaluation indicators.

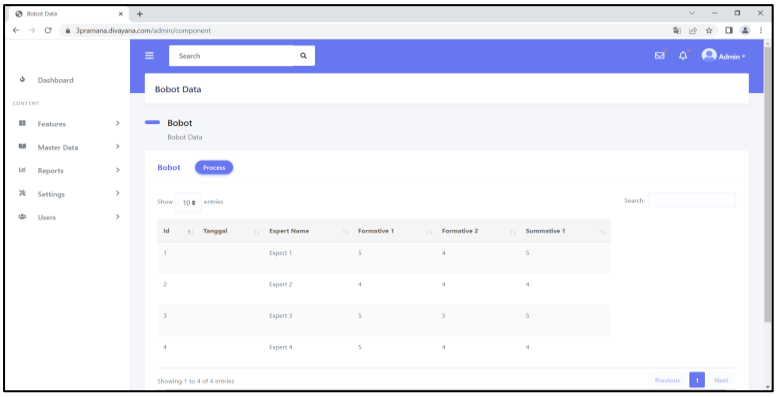

Figure 4. Display Form for Input Weight Values given by Experts (in Bahasa)

Figure 4 shows the display of the form to facilitate input of weight values given by the experts. The weight intended is the significance rating score given by the experts to each evaluation component. The weight values from these experts are stored in one table. The table consists of several fields, including ID, date, experts' name, significance rating score on the formative components, and significance rating score on the summative components.

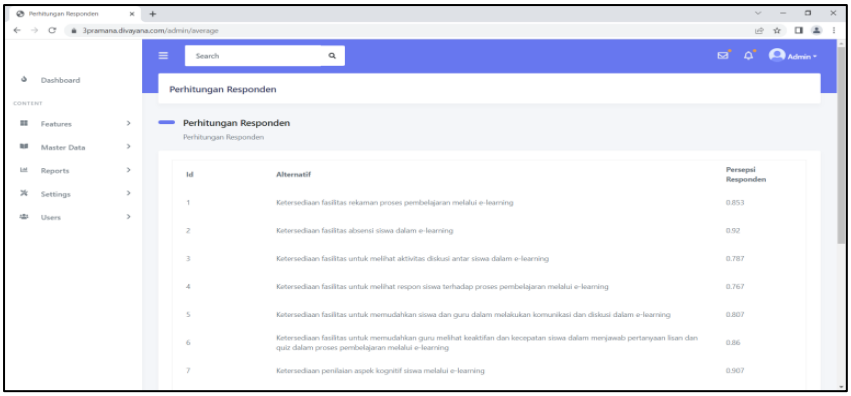

Figure 5. Display Form for the Process of Calculating Respondents' Perception Scores (in Bahasa)

Figure 5 shows the display of the form for the process of calculating respondent perception scores. The data resulting from the process of calculating respondents' perception scores are stored in one table. The table consists of several fields, including ID, alternatives/aspects/evaluation indicators, and respondents' perception scores.

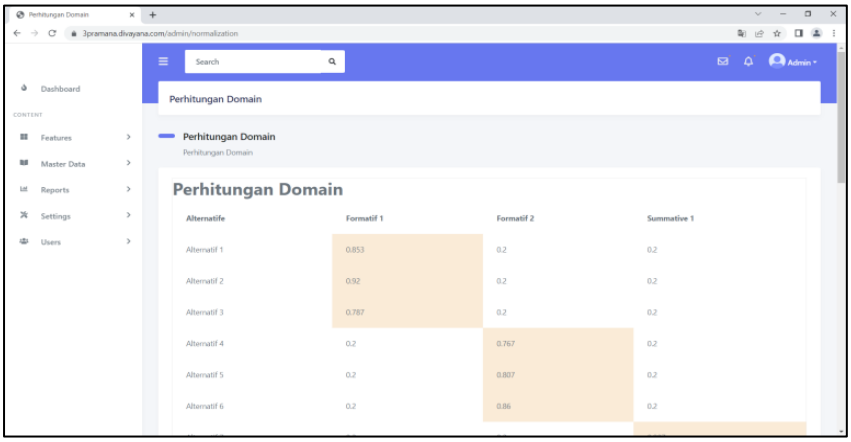

Figure 6. Display Form for Domain Calculation Process (in Bahasa)

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Figure 6 shows the form display for the domain calculation process. In this form, the Weighted Product method is used to determine the most dominant aspects determining the effectiveness of e-learning. In this form, the domain calculation results are stored in one table. The table consists of several fields, including alternatives or aspects or evaluation indicators, domain scores on the formative components, and domain scores on the summative components.

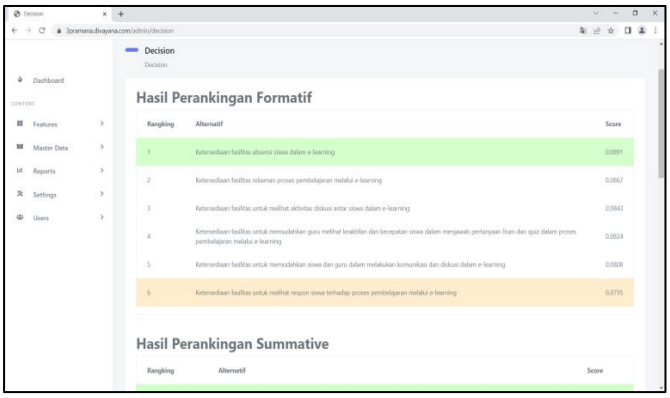

Figure 7. Display Form to show the Decision Results (in Bahasa)

Figure 7 shows the form used to display the evaluation decision results. The results of the evaluation decision are based on the ranking for each alternative/aspects/evaluation indicators. The highest ranking indicates the most dominant aspect determining the effectiveness of e-learning. There were 54 respondents involved in the field trials of the WP-TP-based F-S Evaluation Tool. 15 questions must be answered by the 54 respondents. The results of the field trials intended can be seen in table 2.

Table 2. Field Trials Results of WP-TP-based F-S Evaluation Tool

Respondents	Items															Percentage of Effectiveness
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
EX-01	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	78.67
EX-02	5	4	4	4	4	5	5	4	5	4	4	4	4	5	5	88.00
EX-03	4	5	5	3	3	4	4	4	4	5	5	3	3	4	4	80.00
EX-04	5	4	4	4	4	4	4	4	5	4	4	4	4	4	4	82.67
LR-01	4	3	5	4	4	4	4	5	4	3	5	4	4	4	4	81.33
LR-02	3	4	4	5	5	5	5	4	3	4	4	5	5	5	5	88.00
LR-03	4	4	4	4	4	4	4	5	4	4	4	4	4	4	4	81.33
LR-04	4	4	4	3	3	4	4	4	4	4	4	3	3	4	4	74.67
LR-05	5	5	5	4	4	3	3	3	5	5	5	4	4	3	3	81.33
LR-06	4	4	4	4	5	5	4	4	4	4	4	5	4	4	5	85.33
LR-07	4	5	5	4	4	4	4	4	5	5	3	4	4	5	4	85.33
LR-08	4	4	4	4	4	4	4	4	4	5	4	5	4	5	4	84.00
LR-09	4	4	4	4	4	4	4	4	4	4	4	5	4	4	4	81.33
LR-10	5	5	4	4	5	5	5	5	4	4	4	4	3	4	3	85.33
LR-11	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	78.67
LR-12	4	4	4	4	4	4	4	4	5	5	4	4	4	4	4	82.67
LR-13	4	4	4	4	4	4	4	4	4	4	3	4	5	5	4	81.33
LR-14	5	5	5	5	4	4	4	4	4	4	4	4	4	4	3	84.00
LR-15	4	4	4	4	4	4	4	4	4	3	4	3	4	4	4	77.33
LR-16	4	4	4	4	5	5	4	4	4	4	4	3	3	3	3	77.33

 ISSN 2723-6471

Respondents	Items															Percentage of Effectiveness
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LR-17	4	4	4	4	4	4	3	4	5	5	4	4	4	4	4	81.33
LR-18	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	78.67
LR-19	5	5	5	4	4	4	4	4	4	3	3	4	4	4	4	81.33
LR-20	4	4	4	5	5	3	3	5	5	4	4	5	5	5	5	88.00
LR-21	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	84.00
LR-22	4	4	4	5	5	4	4	4	4	5	5	3	3	3	3	80.00
LR-23	3	3	3	4	4	5	5	3	3	4	4	4	4	4	4	76.00
LR-24	4	4	4	5	5	4	4	4	4	4	4	5	5	5	5	88.00
LR-25	4	4	4	4	4	3	5	4	4	4	4	4	4	4	4	80.00
LR-26	5	5	5	5	3	4	4	5	5	5	5	3	3	3	3	84.00
LR-27	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	80.00
LR-28	3	3	3	4	4	4	4	3	3	4	4	4	5	4	5	76.00
LR-29	4	4	4	5	5	5	5	4	4	3	3	4	4	4	4	82.67
LR-30	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	85.33
LR-31	5	5	5	3	3	3	3	4	4	4	4	4	4	4	4	78.67
LR-32	4	4	5	4	4	4	4	3	5	4	4	4	4	4	4	81.33
LR-33	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	80.00
LR-34	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	86.67
LR-35	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5	80.00
LR-36	4	4	4	4	3	5	4	4	4	4	4	4	4	4	4	80.00
LR-37	4	4	4	4	4	4	4	3	3	3	4	4	4	4	5	77.33
LR-38	5	5	4	4	4	4	4	4	4	4	5	5	5	5	4	88.00
LR-39	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	77.33
LR-40	4	4	4	4	5	5	5	3	3	3	4	4	4	4	4	80.00
EV-01	5	5	4	4	4	4	4	4	4	4	5	5	5	5	4	88.00
EV-02	4	4	5	5	3	4	4	4	4	4	4	4	4	4	5	82.67
EV-03	4	4	4	4	4	3	3	5	5	5	3	3	3	3	4	76.00
EV-04	5	5	3	3	4	4	4	4	4	5	4	4	4	4	4	81.33
EV-05	4	4	4	4	5	4	5	4	4	4	4	4	4	4	4	82.67
EV-06	4	4	4	4	4	5	4	5	5	5	5	5	4	4	3	86.67
EV-07	4	4	5	5	3	4	4	3	3	3	3	4	4	4	4	76.00
EV-08	4	4	4	5	4	5	4	4	4	4	4	3	5	4	3	81.33
EV-09	4	4	4	4	4	5	4	4	4	4	4	4	4	4	4	81.33
EV-10	5	5	4	4	4	4	3	5	5	4	4	4	4	4	4	84.00
Average																**81.73**

Photo documentation is needed to show that the field trial activities have been truly valid. Photo documentation from field trials conducted by respondents at several health colleges can be seen in figure 8.

 ISSN 2723-6471

Figure 8. Documentation Photo of Field Trials

In addition to providing an assessment score on the effectiveness of the WP-TP-based F-S evaluation tool, respondents also provided several suggestions for revisions to the application. It can be seen in table 3.

Table 3. Suggestions for Revision of WP-TP-based F-S Evaluation Tool

Respondents	Suggestions
EX-01	Please add a facility to edit the weight value of the evaluation component given by the experts.
EX-03	Please add facilities to edit the rating score of the respondent's significance.
LR-04	Please add access time settings to the data history form.
LR-11	Please add facilities to edit the weight score that must be given by experts for each evaluation component.
LR-15	There needs to be a facility provided in the tool to be able to edit the score of the respondent's significance rating.
LR-16	Form data history needs to be added facilities to set the start and end time to access it.
LR-18	Please provide facilities to make it easier for experts to edit the weight values for each evaluation component.
LR-23	Preferably there needs to be a feature to be able to do editing on the score of the respondent's significance rating.
LR-28	Access time on the data history form needs to be regulated so the data displayed is clearer and more structured.
EV-03	Add the facility to edit the weight score given by the expert for each evaluation component.
EV-07	Please add a feature to be able to edit the score of the respondent's significance rating.

Based on the suggestions shown in Table 3, the researchers revised the WP-TP-based F-S evaluation tool. Revision in figure 9 to answer inputs by respondents EX-01, LR-11, LR-18, and EV-03. Revision in figure 10 to answer inputs by respondents EX-03, LR-15, LR-23, and EV-07. Revision in figure 11 to answer inputs by respondents LR-04, LR-16, and LR-28.

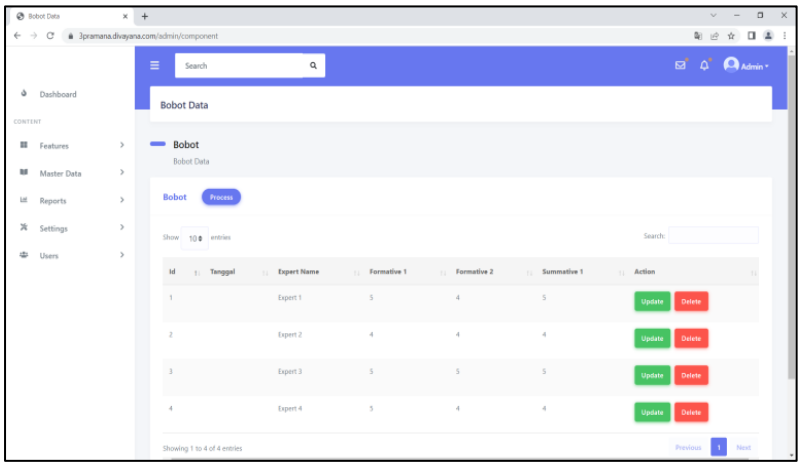

Figure 9. Feature Display for Edit the Weight Value Given by the Expert for Each Evaluation Component (in Bahasa)

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Figure 9 shows the display of the feature used to edit the weight values from experts for each evaluation component. In this feature, there is an update button which is used to update weight values that have been changed, and a delete button to delete the record row that want to delete. In this feature, there is a table that is used to store data resulting from changes to weight values. The table consists of several fields, including ID, date, experts' name, weight score on the formative components, and weight score on the summative components.

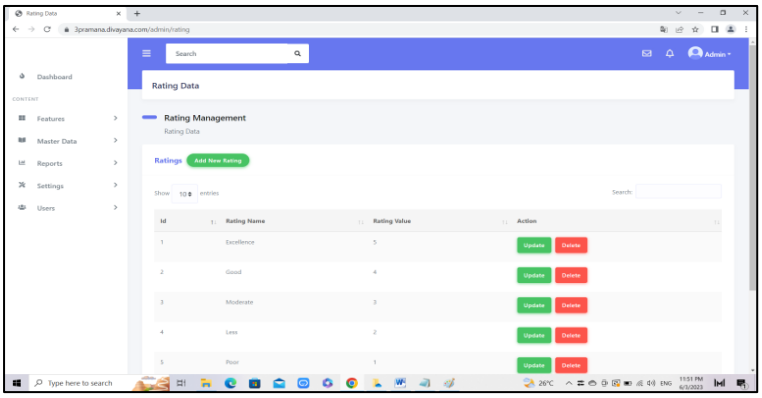

Figure 10. Feature Display for Editing Respondents' Significance Rating (in Bahasa)

Figure 10 shows the display of the feature used to edit respondents' significance rating values. In this feature, there is an update button which is used to update the significance rating value that has been changed, and a delete button to delete the row of significance rating value records that want to delete. In this feature, there is a table used to store data resulting from changes to the significance rating value. The table consists of several fields, including ID, rating name, and rating value.

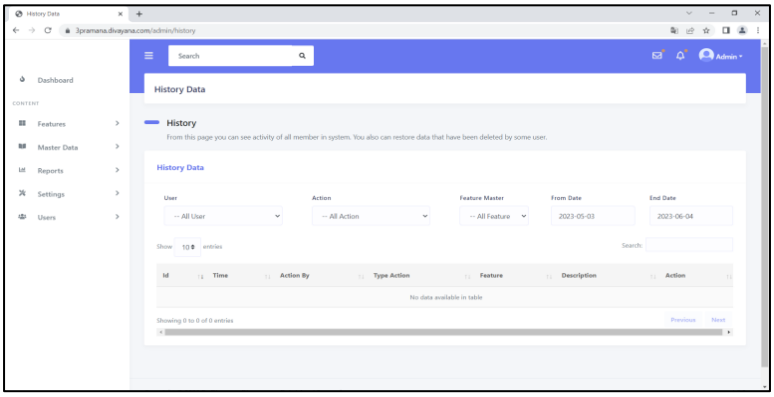

Figure 11. Display of Addition of Time Setting Feature on Data History Form (in Bahasa)

Figure 11 shows the appearance of adding the time setting feature to the history data form which is used to set the time so you can view the history data record on the digital evaluation tool. The most important part of this feature is the two date-time-pickers which function to set the start and end times of historical data. There is a table that functions to show detailed historical data based on the start and end dates selected by the user.

3.2. Discussion

Based on the results shown in figures 1 to figure 7, it shows innovative findings in the form of forms that can be used to facilitate the process of searching the dominant aspects determining the effectiveness of e-learning in health colleges. From those findings, several limitations were able to be immediately overcome during the research and some cannot be overcome as challenges. Several limitations that can be overcome directly include 1) the unavailability of facilities to edit the weight values of evaluation components given by experts; 2) there are no facilities available to edit respondents' significance rating scores; and 3) there are no facilities to set the start and end times of historical data. Those three limitations can be overcome immediately, by providing several additional features in the digital evaluation tool. Besides that, an additional feature in the digital evaluation tool shows there is

concrete evidence that several of the respondents' suggestions given during field trials were answered. The challenge that cannot be solved is that trials for use and implementation have not been carried out on a larger scale, so we cannot yet know to what extent this application is reliable for use as an evaluation tool on a wide scale.

There were 15 questions used to obtain respondents' perceptions in the field trial of the WP-TP-based F-S evaluation tool. The question items intended include 1) clarity of the formative evaluation components in the WP-TP-based F-S evaluation tool; 2) clarity of summative evaluation components in the WP-TP-based F-S evaluation tool; 3) clarity of evaluation aspects in the formative components of the WP-TP-based F-S evaluation tool; 4) clarity of evaluation aspects in the summative components of the WP-TP-based F-S evaluation tool; 5) clarity of internalizing the Pratyaksa-Pramana concept into the formative evaluation components in the WP-TP-based F-S evaluation tool; 6) clarity of internalizing the Anumana-Pramana concept into the formative evaluation components in the WP-TP-based F-S evaluation tool; 7) clarity of internalizing the Agama-Pramana concept into the summative evaluation components in the WP-TP-based F-S evaluation tool; 8) clarity of the position of measurement instruments in the WP-TP-based F-S evaluation tool; 9) clarity on the use of the weighted product method in the WP-TP-based F-S evaluation tool; 10) clarity of recommendations for the WP-TP-based F-S evaluation tool; 11) clarity of evaluation work stages in the WP-TP-based F-S evaluation tool; 12) display of the user interface of the WP-TP-based F-S evaluation tool; 13) security of data stored in the WP-TP-based F-S evaluation tool; 14) ease of access to every feature in the WP-TP-based F-S evaluation tool; and 15) ease of operation of the WP-TP-based F-S evaluation tool.

The results of field trials on the WP-TP-based F-S evaluation tool showed an effectiveness percentage of 81.73%. The effectiveness of the WP-TP-based F-S evaluation tool is classified as good if the results compare the results with the percentage of effectiveness which refers to a five's scale. igure 9 to 11 shows several additional features in the WP-TP-based F-S evaluation tool in response to some of the respondents' suggestions when conducting field trials.

The results of this research have been able to answer several limitations of previous studies. The limitations of Dakir et al.'s research [23], Rerung & Hartono's research [26], and Prasetya's research [28], regarding the difficulty in showing the results of the assessment process from the beginning to the end of learning have been answered through the results of this research. The results of this research have shown that there are evaluation decisions on the formative (beginning and during learning) and summative (end of learning) components. Evidence from the results of this research as an answer to the limitations of Dakir et al.'s research, Rerung & Hartono's research, and Prasetya's research can be seen in full in figure 7. The limitations of Darmawan et al.'s research [24], and Rinaldi et al.'s research [27], related to the difficulty in demonstrating assessments of student learning outcomes in the affective and psychomotor domains. However, it was only limited to the cognitive domain which is carried out at the end of the learning process. Limitations of Darmawan et al.'s research, and Rinaldi et al.'s research have been answered through the results of this research by showing that there are evaluation decisions. Evaluation decisions on the formative and summative components so that the cognitive, affective, and psychomotor domains can be measured as a whole. Evidence from the results of this research is an answer to the research limitations of Darmawan et al., and the research of Rinaldi et al. can be seen in full in figure 7. Limitations of the research by Schellekens et al. [25] regarding the difficulty in indicating the dominant aspects that trigger the quality of the assessment program have been answered through the results of this research. The results of this research have shown that there is a ranking calculation process in determining the dominant aspects determining the effectiveness of e-learning. Evidence from the results of this research is an answer to the research constraints of Schellekens et al. can be seen in full in figure 6.

Other studies have the same objectives as this research. Examples are the study by Jurāne-Brēmane [43], the study by Çekiç & Bakla [44], the study by Bearman et al. [45], the study by Adelia et al. [46], the study by Babo et al. [47], and the study by Zhang [48], which generally show digital format evaluation tools and the trial process of those evaluation tools. The novelty of this research was showing the effectiveness of digital evaluation tool that can determine the dominant aspect determining the effectiveness of e-learning through field trials. Another novelty was that this study showed the user interface/visualization design of the digital evaluation tool which was a combination of educational evaluation models, decision support system methods, and local wisdom of the Balinese people.

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4. Conclusions

This digital evaluation tool is the result of a combination of the educational evaluation model (Formative-Summative), the decision support system method (Weighted Product), and the local wisdom of the Balinese people (Tri Pramana). In general, the appearance of the digital evaluation tool and the field trial results illustrate that the effectiveness of the digital evaluation tool is categorized as good, even though there are several improvements to the features of the tool. The reason for making improvements to digital evaluation tools' features is very important and makes a good contribution to increasing the usability and effectiveness of the tool. The novelty of this research is that it shows a visualization of a digital evaluation tool that can be used to determine the dominant aspects determining the effectiveness of e-learning. The limitation of this research is there have not been trials of use and implementation on a larger scale for this digital evaluation tool. Future work that needs to be done to overcome this research obstacle is to carry out trials of use, dissemination, and implementation of the WP-TP-based F-S evaluation tool on a wider scale. The impact of this research on the field of informatics is that there is new knowledge for researchers/observers in the field of informatics to develop the scientific domain of informatics towards practical application in the field of educational evaluation, especially e-learning evaluation. The new knowledge in the field of informatics intended is related to decision support system methods which can be integrated with educational evaluation models and local wisdom concepts, thereby producing evaluation tools that are suitable for determining the dominant aspects determining the effectiveness of e-learning.

5. Declarations

5.1. Author Contributions

Conceptualization: I.P.W.A., W.S., I.M.A., and D.G.H.D.; Methodology: I.P.W.A., W.S., and I.M.A.; Software: A.W.O.G., and D.G.H.D.; Validation: I.P.W.A., W.S., I.M.A., and G.A.D.S.; Formal Analysis: I.P.W.A., W.S., I.M.A., and D.G.H.D.; Investigation: I.P.W.A., W.S., I.M.A., and G.A.D.S.; Resources: I.P.W.A., W.S., I.M.A., and G.A.D.S.; Data Curation: I.P.W.A., W.S., I.M.A., and D.G.H.D.; Writing Original Draft Preparation: I.P.W.A., G.A.D.S., and D.G.H.D.; Writing Review and Editing: I.P.W.A., G.A.D.S., and D.G.H.D.; Visualization: G.A.D.S., A.W.O.G., and D.G.H.D.; All authors have read and agreed to the published version of the manuscript.

5.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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5.4. Institutional Review Board Statement

Not applicable.

5.5. Informed Consent Statement

Not applicable.

5.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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