

## EPRO-DEEP Module Based on Values, Critical Reflection, and Deep Learning to Improves Professional Ethics in PPG Students

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### Abstract

#### Abstract

This study aims to develop the 'EPRO-DEEP' (Ethics and Professionalism – Deep Learning Embedded Pedagogy) LMS module to enhance PPG students' understanding of professional ethics through the integration of values-based learning, critical reflection, and deep learning. The module was designed using the ADDIE methodology, which involves needs assessment, design, development, implementation, and evaluation. Validation results indicated strong feasibility, with material, media, and instructional design expert scores of 88.9%, 91.25%, and 91.3%, respectively. The practicality test yielded a score of 90.24%. The paired sample t-test revealed a significant improvement in students' comprehension of professional ethics ( $p = 0.000$ ,  $p < 0.05$ ), demonstrating the effectiveness of the module in bridging ethical theory with practical application. These findings suggest that combining values-based learning with reflective and deep learning approaches can meaningfully improve students' understanding of professional ethics, making a tangible impact on their ability to apply ethical concepts in real-world settings. The study provides insights for educators, LMS developers, and PPG organizers to develop reflective, interactive, and technology-driven ethics education. Moving forward, further research could explore the expansion of this module to broader contexts and the potential integration of AI for more personalized learning experiences.

**Keywords:** teacher ethics and professionalism, critical reflection, deep learning, LMS PPG, EPRO-DEEP

#### Abstrak

Penelitian ini bertujuan untuk mengembangkan modul LMS 'EPRO-DEEP' (*Ethics and Professionalism – Deep Learning Embedded Pedagogy*) untuk meningkatkan pemahaman mahasiswa PPG tentang etika profesional melalui integrasi pembelajaran berbasis nilai, refleksi kritis, dan pembelajaran mendalam. Modul ini dirancang menggunakan metodologi ADDIE, yang mencakup analisis kebutuhan, desain, pengembangan, implementasi, dan evaluasi. Hasil validasi

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menunjukkan kelayakan yang tinggi dengan skor ahli materi 88,9%, ahli media 91,25%, dan ahli desain instruksional 91,3%. Uji kepraktisan menghasilkan skor 90,24%. Uji t sampel berpasangan menunjukkan peningkatan signifikan dalam pemahaman mahasiswa tentang etika profesional ( $p = 0,000$ ,  $p < 0,05$ ), yang menunjukkan efektivitas modul dalam menjembatani teori etika dengan penerapan praktis. Temuan ini menunjukkan bahwa kombinasi pembelajaran berbasis nilai dengan refleksi kritis dan pembelajaran mendalam dapat meningkatkan pemahaman mahasiswa terhadap etika profesional secara berarti, serta memperkuat kemampuan mereka untuk menerapkan konsep etika dalam konteks nyata. Penelitian ini memberikan wawasan bagi pendidik, pengembang LMS, dan penyelenggara PPG untuk mengembangkan pendidikan etika yang reflektif, interaktif, dan berbasis teknologi. Ke depan, penelitian lebih lanjut dapat mengeksplorasi perluasan penggunaan modul ini ke konteks yang lebih luas dan potensi integrasi AI untuk pengalaman pembelajaran yang lebih personal.

Kata kunci: etika dan professionalism guru, refleksi kritis, deep learning, LMS PPG, EPRO-DEEP



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## **1. INTRODUCTION**

Professional ethics are the key element in forming the character, moral competence, and integrity of teachers as professional educators. Teachers not only act as conveyors of knowledge, but also as role models of values and morals for students (R. Rahayu et al., 2023). Professional ethics allow teachers to specify the basis for judgement and afford them the capacity to make decisions reflecting fairness, honesty, and social concern. 21st-century education is forcing teachers to master both pedagogical and technological competences, as well as develop a more complex ethical awareness confronting them with perplexing professional dilemmas (Kretz et al., 2021). However, professional ethics is a paramount, is a classical concept and is widely accepted that ethics teaching is vital, efficacy of such teaching, as opposed to traditional teaching of ethics, and ethics theory, has not received proper attention as there is an increasing belief that the paper-based ethos of ethics teaching is not going to cope with the real-life dilemma faced in the daily lives of the educators. This made an orientation to bridge the gap between theory and practice in classroom settings in real context (Damia & Maharani, 2023).

Various studies show that violations of the code of ethics and professionalism of teachers remain a serious problem in the education sector in various countries. Teacher absenteeism, for example, is frequently cited as one of the most severe forms of ethical misconduct, particularly in developing countries. According to Patrinos, absenteeism rates range from 11 to 30 percent in primary schools across several developing nations, with Uganda reaching 27 percent, where teachers are present in schools but fail to perform their teaching duties effectively (Carrizosa & De Witte, 2024). This situation reflects both individual neglect of professional responsibility and broader issues related to the integrity of the teaching profession. Other reports by the U4 Anti-Corruption Resource Centre refer to a more widespread phenomenon, such as academic fraud, bribery and nepotism that deepens generalised distrust in the education sector (Kirya, 2019). These results indicate that ethical transgressions are not only personal failings, but reflect systemic problems in education. Compatible with the previous criticism, several studies report that ethics education in many countries is declarative, meaning

prevalent teaching is transmission of theoretical knowledge and does not provide an avenue for reflection practice (Malone, 2020; Rezania et al., 2020). When applied to ethics education, the consensus acknowledges that merely presenting theories and theories of ethics is insufficient, and proposes that teachers should be engaged in a process of critical reflection through case studies, professional dilemmas, and reliance on value-based discussions (Muniasamy & Alasiry, 2020).

In Indonesia, the Teacher Professional Education Programme (PPG) is crucial for preparing teachers with professional competency and ethical character as future educators. One of the core courses in this program is Teacher Ethics and Professionalism, designed to promote moral consciousness, social awareness, and professional integrity necessary for future teachers. Nevertheless, reviews indicate that ethics education in the PPG is mainly theoretical and informational and lacks scope for critical reflection or practice (Nurgenti et al., 2025; Perguna, 2024; Sumiati, 2023). The survey from PPG students indicated that ethics and professionalism training continues to be primarily theoretical with little attention to application in practice. Many students express that the course lacks opportunities for ethical reflection and that the Learning Management Systems (LMS) used in the program do not adequately support critical reflection-based learning. These disconnects between the theoretical promises of ethics education and the way they are enacted in practice signal a notable gap in teacher preparation. Although 83.06% of teachers are rated as ethically responsible, only 29.30% report receiving sufficient coaching to meet their ethical obligations, and about 60% of teachers still face challenges in mastering ICT, which hinders the use of LMS for reflective learning (Amiruddin et al., 2023; Hartati, 2019). These findings provide evidence of a chasm between the normative teaching of professional ethics, and how this plays out in real life as teachers.

Though the significance of professional ethics is obligatory, the majority of studies in Indonesia still explore the topic in theoretical terms without even attempting to answer how ethics is integrated into real-world practice through reflection. Thus far, no holistic research synthesizes values, critical reflection, and deep approaches to learning into a single educational framework in a unified model of ethics training in teacher professional education. This indicates the need for a different way of looking at how theory, values and professional ethics practices are linked.

One potential solution to address this issue is to develop the 'EPRO-DEEP' (Ethics and Professionalism – Deep Learning Embedded Pedagogy) LMS module, which integrates values education, critical reflection, and a deep learning approach in the learning of Ethics and Professionalism for Teachers. The values based way is an exploration of meaning that leads to a sense of what is right and a better way for students to internalise moral principles (Prabowo, 2024). Critical reflection lends itself to the analysis of professional dilemmas and the development of a contextual ethical awareness, while deep learning contributes to strengthened conceptual understanding, interconceptual connections and advanced higher-order thinking skills that promote moral awareness (Asri, 2024; Muniasamy & Alasiry, 2020). It is those three approaches combined that will fill that theoretical-practice gap in professional ethics, allowing PPG students to not just understand ethical principles theoretically but to apply them practically by reflection and professional case analysis.

There are many studies from the past that argue for the integration of values, reflection and deep learning in teacher professional education. Damia & Maharani (2023) revealed that the implementation of teacher professional ethics often emphasises formal responsibilities without internalising moral values and ethical exemplary behaviour. W. Rahayu et al. (2023) show that teacher professional ethics directly influence the character formation of students, but their implementation is still declarative in nature. Hidayani et al. (2025) secure the importance of ethics learning through case studies and reflection in order that students can apply values to professional work. Meanwhile, Prabowo (2024) shows that LMS which promote moral values could enhance student moral responsibility however moral morals on emotional values such as honor are still hard to digitalize. Similar results were found by Supiani et al. (2024) and Faraniza (2021), which showed that integration of LMS and character values could enhance students' responsibility, empathy, collaboration, and social competence among students. These findings suggest that learning teacher ethics that is values-based, critically reflective, in depth, and supported by an interactive LMS is most effective. However, so far, there has been no research that comprehensively integrates these three aspects simultaneously in the context of PPG in Indonesia. This gap will be filled by this study through the development of the 'EPRO-DEEP' module.

This research approach differs from previous studies, which generally still view ethics learning theoretically and normatively without systematic integration between values, critical reflection, and deep learning (Damia & Maharani, 2023; Hidayani et al., 2025). This study focused to developed an interactive digital module, 'EPRO-DEEP,' to increase prospective teachers' understanding of professional ethics, using a Research and Development (R&D) approach to expert validation and effectiveness testing. This module is an experimental learning model that embedded values, critical reflection and deep learning in the form of a single LMS based learning ecosystem trait relevant to the PPG programme context. Without updates in the teaching of Ethics and Teacher Professionalism, the learning process will be comprehensive and even normative so that the challenges faced by practitioners working in the future face the challenges of the digital era of the teaching profession. This phenomenon may lead to teachers-to-be having superficial understandings of ethics that are devoid of grounding in actual experience. Consequently, value-based, critical reflective, and deep learning modules are developed as a strategy to improve prospective teacher professional ethical understanding in Indonesia.

This study aims to develop a digital teaching module called 'EPRO-DEEP' (Ethics and Professionalism – Deep Learning Embedded Pedagogy) based on LMS, which is designed to meet the eligibility criteria in terms of material, media, and instructional design in the Ethics and Professionalism of Teachers course. Additionally, this research also aims to examine the effect of using this module on the improvement of PPG student learning outcome on a more contextual, reflective and valuebased learning in professional ethics.

## 2. METHODS

### 2.1. Research Design

This R&D project will create LMS material for 'EPRO-DEEP' training modules on Teacher Ethics and Professionalism using values, critical reflection, and a deep learning methodology. This research use Ghirardini's ADDIE methodology, which includes Analysis, Design, Development, Implementation, and Evaluation (Yafie, Pramono, et al., 2024). Its rigorous and deliberate approach to digital learning product development made it the candidate. Research flow is presented in Figure 1.

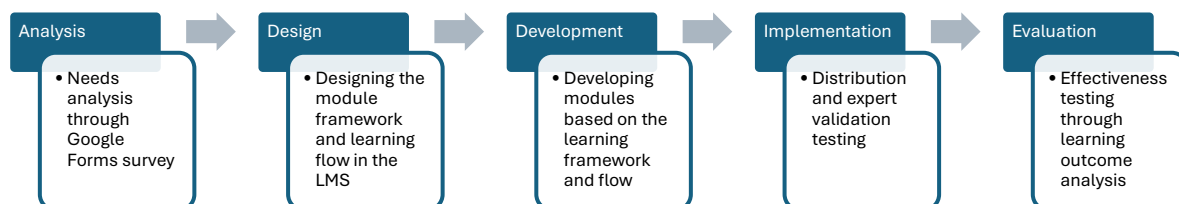


Figure 1. Research Flow

This study involved an effectiveness test using a one-group pretest–posttest design (Figure 2). This design was chosen to observe changes in students' understanding of professional ethics after being given treatment in the form of using the EPRO-DEEP LMS module in learning Ethics and Professionalism for Teachers.

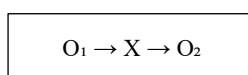


Figure 1. Research Design

Description:

$O_1$  = Pre-test before using the EPRO-DEEP module

X = Treatment in the form of learning using the EPRO-DEEP LMS module

$O_2$  = Post-test after using the EPRO-DEEP module

## 2.2. Participants

Participants in this research were course participants in "Teacher Ethics and Professionalism" offered by Malang State University's Teacher Professional Education Program (PPG). Specifically, the participants were pre-service students currently undergoing their teaching practice (PPL). These students were offered the opportunity to participate in the research on a voluntary basis, participation was not mandatory. Only those who actively participated in class and had access to the learning management system were selected through purposive sampling. A total of 30 students were involved in the effectiveness test stage, with their selection made using the purposive sampling technique. Additionally, three expert validators were involved: a subject matter expert (PPG professional ethics lecturer), a media expert (educational technology lecturer), and an instructional design expert (digital pedagogy lecturer). All data collected from participants have been anonymized to maintain confidentiality, and this information was only used for the purpose of this study, in accordance with ethical protocols and approval.

## 2.3. Instruments

The collected data through expert validation surveys, user questionnaires, and learning outcome assessments (pre-test and post-test). Validation was carried out involving three validators to assess the appropriateness of the material, media delivery, and consistency of the learning design. PPG students conducted practicality tests to evaluate the usability and pertinence of the information to educational requirements. An efficacy assessment was performed to ascertain the degree to which the EPRO-DEEP curriculum enhances students' comprehension of professional ethics.

## 2.4. Data Analysis

The data obtained were analysed using quantitative and qualitative approaches. The validation data were analysed descriptively by converting the scores into percentages to determine the validity level of the module. The practicality data were analysed descriptively to assess the level of ease of use, clarity of display, and suitability of content to student needs. The percentages were categorised into four classifications, it can be seen in Table 1.

**Table 1.** Criteria of Validation and Practicality Test.

No	Percentage	Criteria
1	> 81,25%	Very Valid/No Revision/Very Practical
2	62,5% - 81,25%	Valid/No Revision/Practical
3	43,75% - 62,5%	Less Valid/Revision Required/Less Practical
4	< 43,75%	Not Valid/Revision Required/Not Practical

Source: Arikunto (2014)

A paired sample t-test was performed on the pre and post test results to evaluate the effectiveness of the module on the students. This instrument was designed to evaluate fundamental differences in understanding of professional ethics prior and subsequent to use of the module. The decision rule was significance values ( $p \leq 0.05$ ), which imply that the module improved the Understanding of Professional Ethics. Qualitative analyses of the reflection and observation data were undertaken to corroborate the interpretation of the results on the ethics effectiveness test focusing on the increases in students' ethical awareness and reflective learning experiences.

## 3. RESULTS

Table 2 below show the overview of the primary content areas of the EPRO-DEEP module based on a review of the needs and learning outcomes of potential educators.

**Table 2.** Structure of the EPRO-DEEP Module.

No	Title of Topic	Learning Outcomes
1	Foundations of Ethics and Professionalism for Teachers	<ul style="list-style-type: none"><li>Students are able to recognise the basic values of professional ethics for teachers</li></ul>

2	Ethical Dilemmas in Education	<ul style="list-style-type: none"> <li>Students understand the importance of the role of teachers in society from an ethical perspective.</li> <li>Students are able to analyse ethical dilemmas faced by teachers in professional practice.</li> <li>Students can identify and respond to ethical dilemmas based on values and codes of ethics.</li> </ul>
3	Philosophical Perspectives on Professional Ethics	<ul style="list-style-type: none"> <li>Students are able to understand the perspectives of educational philosophy and religious teachings in developing professional ethical values.</li> </ul>
4	National and International Codes of Ethics	<ul style="list-style-type: none"> <li>Students are able to identify and compare national and international standards of teacher ethics.</li> </ul>
5	Self-Development and Ethical Assessment	<ul style="list-style-type: none"> <li>Students are able to assess and develop their personal ethics and professionalism.</li> </ul>
6	Application of Technology and Digital Ethics	<ul style="list-style-type: none"> <li>Students are able to apply professional ethical values through the use of learning technology and design digital media that supports the instilling of ethical attitudes in the teaching and learning process.</li> </ul>

Results of the validation test conducted by the experts are as shown in Table 3 below.

**Table 3.** Validation Test Results from Experts.

Experts	Aspects Assessed	Percentage	Interpretation
Media Expert	Conformity of Module Content with Curriculum and Teacher Professional Ethics	92.5%	Highly Valid
	Depth of Ethical Values and Concepts	90%	Highly Valid
	Overall	91.25%	Highly Valid
Material Expert	Visual Display	87.5%	Highly Valid
	Navigation and Ease of Use	91.67%	Highly Valid
	Interface Compatibility with Devices	87.5%	Highly Valid
	Overall	88.9%	Highly Valid
Instructional Design Expert	Clarity of Learning Objectives	91.7%	Highly Valid
	Consistency of Activity Flow	91.7%	Highly Valid
	Integration of Deep Learning Principles	90.63%	Highly Valid
	Overall	91.3%	Highly Valid

The validation results from three groups of experts (media, subject matter, and instructional design) in Table 3 indicate that the EPRO-DEEP module has achieved an overall high validity level across all assessed aspects. Media experts rated the module's content suitability with the curriculum and teacher professional ethics at 92.5% and the depth of ethical values and concepts at 90%, with an overall average validity of 91.25%, reflecting strong alignment with curricular and ethical standards. Subject matter experts scored high on visual display (87.5%), navigation and ease of use (91.67%), and device compatibility (87.5%), with an average of 88.9%, showing the module provides an accessible and sound user experience. On the other hand, Pedagogical aspects like clarity of learning objectives (91.7%) and consistency of activity flow (91.7%) and deep learning principles (90.63%) were validated by the instructional design experts, yielding an overall 91.3%. These results substantiate that the EPRO-DEEP module is valid, pedagogically sound, and technically-ready for use in teacher professional ethics learning scenarios.

**Table 4.** Practicality Test Results.

No	Aspects Assessed	Percentage	Interpretation
1	Ease of Access and Navigation	89.35%	Highly Practical
2	Content Suitability to Student Needs	89.23%	Highly Practical
3	Activity Suitability	92.13%	Highly Practical
	Overall	90.24%	Highly Practical

The practicality test results show that this module is very practical and effective in supporting the participants' learning experience. From the results in Table 4, the Ease of Access and Navigation was assessed as Very Valid, with a percentage of 89.35%, where participants could easily access and navigate around the module interface fluently, which means participants could find it simple to explore the material. The Content Relevance to Student Needs was rated at 89.23% and also rated as Highly Valid, affirming that the material presented in the module is highly relevant to the needs of the learners in both the context of their education and professional development. Also, the Activity Suitability factor also yielded a high 92.13%, indicating that the activities designed in the module were appropriate and helped scar the learning objectives and engagement of the participants. The practicality score of preprocess module is 90.24% which specifies that the preprocessing module is very practical and can be used effectively providing a good practicality experience for all participants.

**Table 5.** Results of the Normality Test.

	Statistic	Df	Sig.
Pretest	.966	30	.448
Posttest	.969	30	.500

The Shapiro-Wilk test results in Table 5 indicate a significance value (Sig.) of 0.448 for the pretest data and 0.500 for the posttest data. Since both significance values exceed 0.05, it may be inferred that the data are regularly distributed. These findings demonstrate that the distribution of participants' pretest and posttest scores does not differ significantly from a normal distribution, meeting the basic assumptions necessary to advance to other parametric statistical analysis. Thus, the data from the professional ethics concept comprehension test on the EPRO-DEEP Module material can be further analysed using a paired sample t-test to determine whether there is a significant difference between the pretest and posttest results after the implementation of the module.

**Table 6.** Homogeneity Test Results.

		Levene Statistic	df1	df2	Sig.
Learning Outcomes of the EPRO-DEEP Module	Based on Mean	2.816	1	58	.099
	Based on Median	2.712	1	58	.105
	Based on Median and with adjusted df	2.712	1	50.113	.106
	Based on trimmed mean	3.004	1	58	.088

The Levene test results in Table 6 yielded a significance value (Sig.) of 0.099 for variance homogeneity based on the mean. Since the significance value exceeds 0.05, it may be inferred that the learning result data for the EPRO-DEEP Module material exhibits homogeneous variance. This indicates that the data distribution between the pretest and posttest groups is largely uniform or that there is no substantial variance difference. This condition shows that the homogeneity of variance assumption has been met, and thus data were suitable for a paired sample t-test comparing participants' learning outcomes prior to and after using the EPRO-DEEP Module.

**Table 7.** Paired Sample T-test Effectiveness Test Results.

		Paired Differences				t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower Upper			
Pair 1	Pretest - Posttest	-12.50000	9.10381	1.66212	-15.89942 -9.10058	-7.521	29	.000

The efficacy test results, utilizing the Paired Sample T-test as shown in Table 7, yielded a Sig. (2-tailed) value of 0.000, which is below 0.05. This signifies a substantial disparity between the pretest and posttest outcomes of participants following the utilization of the EPRO-DEEP Module material. It means that there was a significant difference between the results of participants 'pretest and posttest after using the material using EPRO-DEEP Module. The diagram shows the mean difference of -12.50, which indicates an improvement in participants going through the curriculum from their prior skills in learning. Therefore, it can be concluded that the EPRO-DEEP Module is effective to improve understanding on professional ethical concepts, since the post-test is significantly higher than the pre-test.

#### 4. DISCUSSION

##### **4.1. Results of EPRO-DEEP Digital Teaching Module Development**

The results of the study show that the development of EPRO-DEEP LMS content focused on the preparation of Ethics and Professionalism modules for teachers that are value-oriented, encourage critical reflection, and are integrated with a learning model that emphasises deep learning. This approach relates with the idea of the Merdeka curriculum which require teachers to be value oriented, reflective and responsive to the changes in curriculum policy and the demands of Society 5.0 and 21st century therefore needing the integration with digital learning models that are designed to shape profesional disposition and moral character (Suhandi & Robi'ah, 2022; Yafie, Setyaningsih, et al., 2024).

The results of the development show that the EPRO-DEEP module is comprehensively designed to facilitate the learning of ethics and professionalism among teachers through a reflective, collaborative, and contextual approach. The structure of this module integrates normative dimensions in the form of understanding professional principles and codes of ethics with practical dimensions in the form of reflections on real experiences in the world of education (Wen, 2024). Learning outcomes and indicators focusing on aspects of knowledge, values, and professional skills are included for each module topic to highlight holistic and authentic learning outcomes. In that regards, authentic assessment and contextual assignments are suggested as effective strategies to align professional competencies of pre-service teachers in a real-world context (Achmad et al., 2022). This structure of materials highlights both the theoretical basis and the application of ethical values in practice through reflection, case studies, and collaboration, which are significant in developing moral sensitivity and professional responsibility (Popovska & Popovski, 2021).

The use of multimodal learning medium and activities, such as interactive videos, supplementation with materials, structured assignments, and discussions, encourages deep learning that improve critical and reflectiveness thinking skills. This strategy supports the evidence that reflective and contextualized strategies enhance the professional identity of pre-service teachers and cultivate ethical sensitivity to authentic classroom dilemmas (Verma et al., 2025). The routine of training, implementation of professional codes of ethics, and the institutional supervision mechanisms are part of a series of factors that are very fundamental to make ethical values translate continuously and responsibly (Panjaitan & Naibaho, 2024).

Meanwhile, learning activities in the module is designed to follow the MERDEKA flow (*Mulai dari Diri, Eksplorasi Konsep, Ruang Kolaborasi, Demonstrasi Kontekstual, Elaborasi Pemahaman, Koneksi Antar Materi, and Aksi Nyata*). This flow encourages deep learning, in which students are invited to recognise their self-worth, understand ethical concepts, discuss and collaborate, and apply these values in the professional practice of prospective teachers (Subroto et al., 2024). Through these stages, students are expected not only to understand ethical concepts cognitively but also to internalise them in their attitudes and actions as prospective educators with integrity.

Overall, the development of the EPRO-DEEP module contributes to the formation of a learning system that fosters integrity, professionalism, and sustainable ethical awareness among PPG students. The resulting learning content and design reflect the integration of theory and practice and support the professional character development of prospective teachers. Thus, this module has the potential to become a relevant learning innovation in shaping a deep understanding of teacher ethics and professionalism in the digital age.

#### **4.2. Results of EPRO-DEEP Digital Teaching Module Effectiveness**

The results of effectiveness testing on understanding of EPRO-DEEP module material show a significant increase in conceptual understanding and student engagement on the topics of ethics and teacher professionalism. The evidence presented here states that modules based on values, critical reflection and a deep leaning approach could integrate theory and practice gap identified in previous studies (Nurgenti et al., 2025; Perguna, 2024; Sumiati, 2023). The results are in support of the hypothesis that integration of values and reflection in the design of the LMS further enhance contextual understanding of professional ethics.

These findings parallel the applied studies which investigate the use of digital modules based on value-oriented practices and critical reflection in the form of e-modules and interactive digital learning designs, which show that embedded successful e-modules to foster interactive characteristics enhance higher-order thinking and learner involvement (Endaryati et al., 2023). Research on the application of problem-based e-modules and various digital learning models also shows an increase in critical thinking skills and knowledge transfer relevant to students' conceptual understanding, which is in line with the pretest and posttest results in the EPRO-DEEP Module (Paksuniemi et al., 2021).

Reflection is an important metacognitive process to enhance their understanding as well as reinforcing the professional competences of the students. In fact, several studies indicate that assisting students in this self-reflection process can help enhance their ability to recognise their own competencies and integrate professional values, resulting in a more solid grasp of ethics and professionalism (Achenbach & Schäfer, 2022). The integration of values, reflective practice, and digital learning technology has also been proven effective in fostering critical awareness and the applicative abilities of prospective teachers, which is in line with the pedagogical design of the EPRO-DEEP Module.

Considering your perspective studying method, the result of this research is also in line with previous studies that stated the gainful use of deep learning-based LMS approach that support analysis, synthesis, reflection, and application of values to a professional situation have positive correlation on the increase of prospective teachers' critical thinking skills and their ethical understanding. Studies on dialogic supervision and digital portfolios also confirm that digital media that facilitate reflective dialogue and documentation of professional practice can deepen students' conceptual and ethical understanding (Choiriyah et al., 2024). Thus, the increased understanding gained through the EPRO-DEEP Module is in line with the reflective and collaborative learning mechanisms identified in various previous studies.

The integration of values, reflection, and the deep learning approach in this module shows that digital learning designs that emphasise critical and reflective thinking processes have the potential to strengthen students' understanding of the concepts of ethics and teacher professionalism.

In incorporating reflective tasks, discussion of values-in-practice, and professional tasks developing conceptual learning activities may promote the needs of cognitive skills as well as values of the profession, strengthening 21st skills and digital literacy as investigated in some studies (Susetyarini et al., 2023). The results are also consistent with the theory of Prabowo (2024) and Faraniza (2021), which put forward by the value-based LMS can improve students' ethical responsibility and empathy. These findings reaffirm that values-integrated digital learning innovations also enhance students not only in terms of conceptual groundings but also as principled and adaptive professionals who can respond to the ever-changing aside world of practicing educators.

#### **4.3. Implication, Limitation, and Future Research**

This research provides empirical support for value-based and reflective learning theories and extends these ideas empirically to suggest that the integration of value-based learning, critical reflection, and deep learning in an EPRO-DEEP module is an effective way of improving students' understanding of professional ethics and bridging theory and practice. These findings offer a pedagogical framework for educators, LMS developers, and PPG organizers in designing engaging, introspective and technology-enhanced ethics education to promote character and professional competency. Acceptance of this paradigm could promote the professionalism and integrity of future educators and hence assist the progress of educational quality in the age of digital education.

The implementation of the EPRO-DEEP module was only carried out in one class at one LPTK campus, so the results cannot yet be generalised to the entire population of PPG students in Indonesia, who have different characteristics, institutional contexts, and technological readiness. Furthermore, this study did not use a quasi-experimental design with a comparison group, so it cannot fully confirm the causal relationship between the use of the module and the improvement in students' understanding of professional ethics. Therefore, the generalisation of the results of this study is still limited, and the findings may differ when applied to other teacher training institutions or in learning contexts with more varied systems and technological support.

Based on the research results and findings obtained, it is suggested that potential areas for further development of EPRO-DEEP Module could expand in coverage by exploring implementation within additional contexts/populations to verify its ability as a consistently effective learning tool. More high-level research might target a digital learning model reflected by artificial intelligence to enable personalised education, support value reflection tracking and enhance students the way of strengthening their digitally-evaluated built portfolio. In practical terms, lecturers and LMS developers are advised to utilise the results of this research in developing professional ethics learning by adding interactive features such as reflective forums, value-based assignments, and collaborative digital supervision. This module can also be adapted for professional teacher training in continuing development programmes, so that the results of this research not only enrich value-based learning theory but also make a real contribution to improving the professionalism and integrity of educators in higher education.

## 5. CONCLUSION

Based on the research results, it can be concluded that the development of the value-based, critical reflection, and deep learning Module 'EPRO-DEEP' (Ethics and Professionalism – Deep Learning Embedded Pedagogy) successfully meets the eligibility criteria in terms of material, media, and instructional design and is effective in improving the understanding of professional ethics concepts among students in the Teacher Professional Education Programme (PPG). The integration of these three main components is able to bridge the gap between the theory and practice of ethics learning by encouraging students to think reflectively, critically, and contextually about the professional dilemmas of teachers. This study contributes new knowledge in the form of the development of a digital reflective pedagogy model that utilises learning technology as a means of internalising moral values and strengthening the professional character of prospective teachers. For further research, it is recommended that the development and implementation of EPRO-DEEP be expanded to various teacher training institutions with a quasi-experimental approach to test its effectiveness comparatively, and be integrated with artificial intelligence to support the personalisation of student reflection and the strengthening of digital portfolios. Practically, the results of this study can be used as a reference for lecturers, LMS developers, and PPG organisers in designing interactive, reflective, and value-oriented professional ethics learning to strengthen the integrity and professionalism of teachers in the digital era.

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## AUTHOR CONTRIBUTION

Conceptualization: EY; Methodology: EY, SW; Software: SMNA; Validation: EY, DI; Formal Analysis: EY; Investigation: EY, SMNA; Resources: EY; Data Curation: EY, SW, DI; Writing—Original Draft Preparation: EY, SMNA; Writing—Review & Editing: EY, SMNA; Visualization: SMNA; Supervision: EY; Project Administration: EY, Funding Acquisition: EY. All authors have read and agreed to the published version of the manuscript.

## CONFLICT OF INTEREST

No conflicts of interest were declared for this study's conduct, authorship, or publication.

## INFORMED CONSENT

Data was protected and informed consent was obtained from all participants.

## ETHICAL APPROVAL

All participant identities and university names were kept anonymous, citations were proper, and no conflicts of interest were stated.

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