PENGEMBANGAN SISTEM PENILAIAN OTOMATIS MATA KULIAH DASAR PEMROGRAMAN WEB UNTUK MYKLASS BERBASIS OPENAI

SKRIPSI

Disusun oleh :

BEATRIX DEVANTI AGSI

20210140001

PROGRAM STUDI TEKNOLOGI INFORMASI

FAKULTAS TEKNIK

UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

2025

HALAMAN PERSETUJUAN I

SKRIPSI

Pengembangan Sistem Penilaian Otomatis Mata Kuliah Dasar Pemrograman Web untuk MyKlass berbasis OpenAI

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Rabu, 16 Juli 2025

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Ketua Peneliti	:	Dr. Ir. Dwijoko Purbohadi, M.T.

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Yang membuat pernyataan,

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KATA PENGANTAR

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1.
2.
3.
4.
5.
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Yogyakarta, 20 Juni 2025

Yang membuat pernyataan

Beatrix Devanti Agsi

LEMBAR PERNYATAAN PENGGUNAAN SISTEM KECERDASAN BUATAN(AI)

Dalam proses penyusunan skripsi ini, penulis memanfaatkan teknologi kecerdasan buatan, yaitu ChatGPT, sebagai alat bantu untuk memperoleh referensi awal, menyusun struktur penulisan, dan mengembangkan ide. Meskipun demikian, seluruh isi skripsi ini telah melalui proses parafrase, penyesuaian, dan penyuntingan oleh penulis sesuai dengan konteks penelitian dan kaidah akademik yang berlaku.

INTISARI

Penelitian ini bertujuan untuk mengembangkan dan mengevaluasi alat e-learning berbasis OpenAI untuk penilaian otomatis kode HTML, CSS, dan JavaScript pada platform MyKlass. Penggunaan AI dalam proses penilaian bertujuan mengatasi tantangan penilaian manual yang memakan waktu dan kurang konsisten. Sistem ini mengintegrasikan modul pembelajaran interaktif yang memberikan umpan balik instan kepada mahasiswa, sehingga mendukung pembelajaran mandiri yang efektif. Penelitian menggunakan pendekatan kuantitatif dengan desain pretest-posttest control group untuk mengukur efektivitas terhadap pemahaman dan motivasi belajar mahasiswa. Hasil wawancara awal menunjukkan bahwa motivasi mahasiswa dalam belajar pemrograman didorong oleh minat pribadi dan tujuan karier. Mahasiswa terbiasa belajar secara mandiri melalui sumber digital serta diskusi informal. Dukungan dari lingkungan sekitar dan keberhasilan menyelesaikan proyek juga menjadi faktor penting dalam mempertahankan semangat belajar. Pengujian sistem menunjukkan bahwa alat ini berpotensi meningkatkan efisiensi penilaian, memberikan umpan balik yang konsisten, serta memperkuat motivasi belajar mahasiswa.

Kata Kunci: e-learning, OpenAI, penilaian otomatis, pembelajaran mandiri, motivasi belajar.

ABSTRACT

This study aims to develop and evaluate an OpenAI-based e-learning tool for the automatic assessment of HTML, CSS, and JavaScript code on the MyKlass platform. The integration of AI into the assessment process is intended to address the challenges of manual grading, which is often time-consuming and inconsistent. The system features interactive learning modules that provide students with instant feedback, supporting more effective and independent learning. A quantitative experimental method with a pretest-posttest control group design was used to measure the tool's effectiveness in improving students' understanding and learning motivation.

Initial interview results reveal that students' motivation to learn programming is driven by personal interest and career goals. Most students study independently using digital resources and informal peer discussions. Support from their surroundings and successful project completion also play a significant role in maintaining learning enthusiasm. System testing indicates that the developed tool has the potential to improve grading efficiency, deliver consistent feedback, and enhance students' motivation to learn.

***Keywords**: e-learning, OpenAI, automatic assessment, self-directed learning, learning motivation.*

RESEARCH SYNOPSIS

Introduction

This study uses structured surveys that aim to gain profound understanding of how students interact with web programming as a learning domain. This survey inspects several key dimensions, including the characteristics of individual educators, the underlying motivation factors, the usual learning practices, and the specific challenges faced during coding activities. The dimensions give a holistic view of cognitive and behavioral processes that shape student experience. The findings obtained from this survey serve as the empirical basis for OpenAI-based automatic design and grading systems. By strengthening the development of the system on the actual learning needs and the observed learning behavior, the resulting tool can provide meaningful feedback, relevant to context, and responsive to general learning difficulties. This alignment increases the potential of the system to support effective skill acquisition, facilitating learning autonomy, and contributing to the study results in web programming education.

Title

Development of an Automatic Assessment System for the Web Programming Fundamentals Course on MyKlass Using OpenAI

Background

Web programming courses require fast, consistent, and accurate evaluation. Manual assessment is time consuming and may lead to inconsistencies. Artificial intelligence provides an opportunity to perform automatic evaluation objectively and efficiently. MyKlass serves as a platform to integrate OpenAI powered automatic assessment that provides immediate feedback to students.

Research Problems

1. How to design an OpenAI based automatic assessment tool for HTML, CSS, and JavaScript.
2. How its performance compares to manual lecturer assessment.
3. How accurate and reliable the system is in providing feedback.

Research Objectives

1. To develop a learning module with an integrated code editor, OpenAI based correction, and automatic scoring.
2. To measure the effectiveness of the module on student understanding and motivation through pretests and posttests.

Research Method

The experiment uses a pretest posttest design with two groups. The experimental group uses CourseLab integrated with OpenAI, while the control group uses conventional learning methods.

System Development

The instructional module was developed using CourseLab, a platform that facilitates the creation of interactive learning materials, and then integrated with OpenAI to support automatic grading capabilities. In this integrated environment, students can write HTML code, CSS, and JavaScript directly in embedded editors. The code was sent to the OpenAI model, which did multilayer evaluations that include synchronization, structural connections, and logical accuracy. At the syntax rate, the system identifies the missing tags, the misplaced parentheses, the incorrect voters, or the invalid JavaScript expression. At a structural level, the system checks out whether the whole code organization follows the accepted conventions, such as pollinating the proper HTML elements, the application of consistent CSS rules, and the separation of code between structure, style, and behavior. On the logical level, the system analyzes whether JavaScript's logic is implemented according to the desired program functionality, detecting problems such as unreachable conditions, handling broken events, and functions or variables applied incorrectly..

The use of the combination of interactive features, Course, and OpenAI's evaluative abilities creates a learning environment where educators receive immediate feedback and are aware of the context. It allows students not only to identify errors, but also to understand why those mistakes happen and how those errors can be corrected. An automatic and relevant evaluation of that pedagogy supports active learning, strengthening conceptual understanding, and enhancing the overall effectiveness of web programming instructions.

Survey Results

This study uses structured surveys to produce a deeper understanding of how students interact with web programming as an academic discipline. A survey was given to the ten undergraduate students listed in this information program exploring several dimensions regarding the learning process, including the characteristics of individual educators, the determination of motivation, the established learning routines, and the challenges usually faced during the encoding activities. This research shows that student interest in programming is mostly influenced by intrinsic interest in digital technology and by aspirations to pursue future careers in fields such as front-end development and backend development. The participants also report that they rely heavily on self-regulated learning strategies, using lots of digital learning resources such as video-based tutorial, online technical documentation, colleagues discussion, and Al aid, especially when facing conceptual inconsistencies or persistent encryption errors.

This empirical insight provides an important foundation for the development of the OpenAI-based automatic assessment system. By harmonizing the design of the system with the needs of documented learning and actual learning behaviors, the tools are positioned to offer pedagogy, responsive to the challenges of often, and consistent with the hope of students for clarity and openness. That kind of alignment increases the system's potential to support self-learning, reduce dependence on instructor availability, and contribute to improved results in web programming education.

System Testing

Testing shows that students can more easily identify and correct mistakes using the automated feedback system. Improvements are suggested for user interface clarity.

Conclusion

The OpenAI based assessment system improves learning efficiency, supports independent correction, and strengthens programming comprehension.

Recommendations

Enhancing task variations, improving user interface design, and creating complete documentation will support future development.

APPENDIX

Survey Question List

1. What made you interested in learning programming?
2. Do you have specific goals you want to achieve through learning programming?
3. How do you usually explore new programming topics?
4. Have you ever tried new technologies or tools on your own?
5. What do you usually do when your code encounters an error and does not run?
6. How do you feel when you fail to complete a coding task?
7. How often do you set aside time weekly to study or practice coding?
8. Do you have a specific study schedule or target?
9. Where do you usually seek help when experiencing difficulties in coding?
10. How often do you read documentation, forums, or other external learning sources?
11. How do you feel when you successfully complete a project that works well?
12. How important is the ability to build something such as a website or application in your learning?
13. Do you actively discuss programming with friends, lecturers, or online communities?
14. How important is discussion or community support for maintaining your motivation to learn?

Survey data

No.	Survey Question	Refined Academic Summary of Responses
1	What made you interested in learning programming?	Students developed an interest in programming due to early curiosity about how websites and digital systems operate. Visual exposure to web interfaces and a desire to understand the underlying mechanisms motivated their engagement with coding.
2	Do you have specific goals you want to achieve through learning programming?	Most respondents articulated clear professional aspirations, particularly careers in frontend and backend development. They perceived programming proficiency as essential preparation for future roles in the technology sector.
3	How do you usually explore new programming topics?	Participants primarily adopted self directed learning strategies, relying on online video tutorials, social media explanations, and peer discussions to explore unfamiliar topics and clarify conceptual uncertainties.
4	Have you ever tried new technologies or tools on your own?	Several students reported independently experimenting with new tools and languages, such as introductory Python programming, even before formal coursework. This reflects proactive and exploratory learning behaviors.
5	What do you usually do when your code encounters an error and does not run?	Students typically attempted to diagnose errors by reviewing their code and interpreting error messages. When difficulties persisted, they sought assistance from AI based tools or consulted peers for guidance.
6	How do you feel when you fail to complete a coding task?	Respondents often experienced initial frustration. However, these emotions generally transitioned into motivation to improve, as students framed such challenges as integral to the learning process.
7	How often do you set aside time weekly to study or practice coding?	Study frequency varied, though many students dedicated between thirty minutes and one hour daily, adjusting their practice routines according to academic demands and personal schedules.
8	Do you have a specific study schedule or target?	A portion of students maintained structured study plans, particularly on weekends, while others adopted flexible learning schedules without fixed time allocations.
9	Where do you usually seek help when experiencing difficulties in coding?	Students initially sought assistance from classmates. If peer support proved insufficient, they referred to online tutorials or used AI based support tools to resolve issues.
10	How often do you read documentation, forums, or other external learning sources?	Respondents engaged with external sources such as documentation and developer forums when deeper technical insight was needed. These resources were used to complement video based and peer explanations.
11	How do you feel when you successfully complete a project that works well?	Students reported a strong sense of accomplishment and increased self confidence upon successfully completing a functional project, reinforcing their motivation and identity as emerging programmers.
12	How important is the ability to build something such as a website or application in your learning?	The ability to construct tangible outputs, such as websites or applications, was viewed as a fundamental component of programming mastery and an essential indicator of learning progress.
13	Do you actively discuss programming with friends, lecturers, or online communities?	Most students actively engaged in discussions with peers, though participation in broader online communities was less frequent. Peer interaction was seen as a valuable support mechanism.
14	How important is discussion or community support for maintaining your motivation to learn?	Respondents emphasized the importance of collaborative discussion and community support. These interactions fostered sustained motivation, facilitated problem solving, and enhanced overall learning engagement.