# Streamlining Faculty Evaluations: A Web-Based System for Enhanced Efficiency and Data-Driven Insights

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**Abstract:** Faculty evaluation is critical for improving teaching and student learning. Traditional methods, often reliant on student surveys, lack detail and miss perspectives. This paper explores a Web-based Faculty Evaluation System (WFES) that leverages collaborative feedback to enhance teaching quality. The proposed WFES goes beyond traditional methods by incorporating multiple sources. It facilitates online student feedback through targeted surveys, self-reflection tools, and potentially integrated peer observation. This enriches the evaluation process with diverse viewpoints. A key benefit is efficient data collection. Online surveys and self-reflection tools reduce administrative burdens and streamline evaluation. Data analysis can identify areas for improvement, inform professional development, and target feedback for faculty. The collaborative nature fosters a culture of continuous improvement. By incorporating student, potentially peer, and self-reflection feedback, the system provides valuable insights for faculty, leading to more informed teaching practices and ultimately benefiting student learning. This research evaluates the implemented WFES using the ISO/IEC 25010 model. A web-based survey gathered feedback from a diverse group. The evaluation yielded promising results, with the WFES achieving a high overall score. However, areas for improvement in resource utilization and user interface design were identified. This research informs future development strategies to refine functionalities, enhance user experience, and ultimately strengthen faculty evaluation effectiveness.

## 1. Introduction

Traditional paper-based faculty evaluation systems can be difficult, prone to errors, and lack efficient data analysis capabilities. Effective faculty evaluation is the foundation of a thriving academic institution. It provides valuable feedback to educators, promotes continuous improvement in teaching practices, and ultimately contributes to student success [1]. However, traditional paper-based evaluation

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systems are often plagued by limitations such as inefficiency, proneness to errors, limited functionality, and subjectivity. This study addresses these shortcomings with the objective of designing, developing, and implementing a Web-based Faculty Evaluation System (WFES) that facilitates the enhancement of teaching quality through the collection and utilization of collaborative feedback mechanisms within educational institutions. Collaborative feedback, where instructors receive input from colleagues and students, has been a powerful tool for fostering professional growth.

Teachers' professional standards globally include a stronger emphasis on teacher research and evaluation [2]. In today's fast-paced world of educational technology, a web-based faculty evaluation system (WFES) offers significant advantages for institutions seeking to adapt and improve [3] compared to paper-based systems. A Web-based Faculty Evaluation System (WFES) provides flexibility and scalability, allowing for easy updates and growth, which is crucial for institutions navigating rapid technological change [4]. Accessibility and efficiency are enhanced as faculty and administrators can access and analyze data online, saving valuable time and resources [5]. Rich data sets gleaned from the system facilitate data-driven decision-making regarding faculty development programs, a basis for continuous improvement in teaching and learning [1].

In the pursuit of continuous improvement in teaching quality, a web-based faculty evaluation system aligns perfectly with the objective of facilitating collaborative feedback mechanisms within educational institutions [6]. Compared to traditional paper-based systems, the Web-based Faculty Evaluation System (WFES) offers several advantages that directly contribute to this goal. Firstly, web-based systems allow for the easy creation and deployment of customizable evaluation forms tailored to specific courses and disciplines [5]. This enables the collection of more targeted feedback that addresses the unique teaching approaches and student experiences within each course. Secondly, a Web-based Faculty Evaluation System (WFES) facilitates the collection of collaborative feedback from both students and potentially peers [6].

This allows instructors to receive a more comprehensive picture of their teaching effectiveness, incorporating valuable insights from colleagues who may possess expertise in similar subject areas. Additionally, web-based systems promote efficiency by enabling secure online data collection and analysis. This saves time and resources associated with paper-based systems, allowing faculty to focus on utilizing the feedback for professional growth [2]. Faculty can access and complete evaluations online, while administrators can collect and analyze data efficiently, saving valuable time and resources [7].

By employing the ISO/IEC 25010 Software Quality Model, this research assesses the effectiveness of the Web-based Faculty Evaluation System (WFES) [8]. A group of 60 participants (students, faculty, and staff) from Wright Technological College of Antique, Inc. evaluated the system, providing insights into its strengths and opportunities for further optimization. This web-based approach has the potential to streamline the faculty evaluation process, enhance data quality, and ultimately foster a more effective and data-driven approach to faculty development.

## 2. Methodology

The Faculty Evaluation System was designed using an iterative development model. This agile approach, as advocated by Puspitasari, *et al.* [9] and Pambudi and Apriandari [10], allowed for continuous refinement and improvement throughout the development process. The system consists of several core modules, each catering to specific functionalities displayed in Figures 1, 2, and 3.
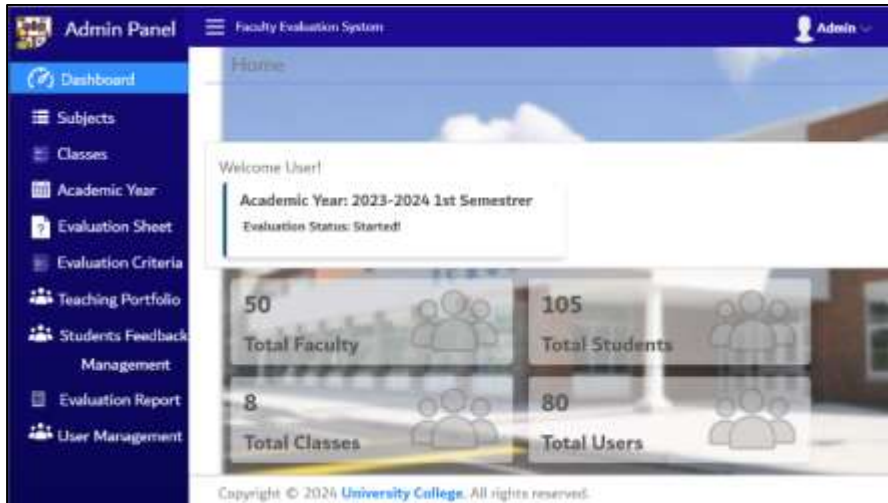
**Figure 1**. The Admin Panel

Figure 1, the admin panel of the Faculty Evaluation System, serves as the central hub for managing system functionalities and user access. Designed with a user-friendly interface, it caters to the specific needs of administrators within the institution. Core modules include User Management, Teaching Portfolio Management, The Evaluation Criteria, Student Feedback Management, and the Evaluation Report.
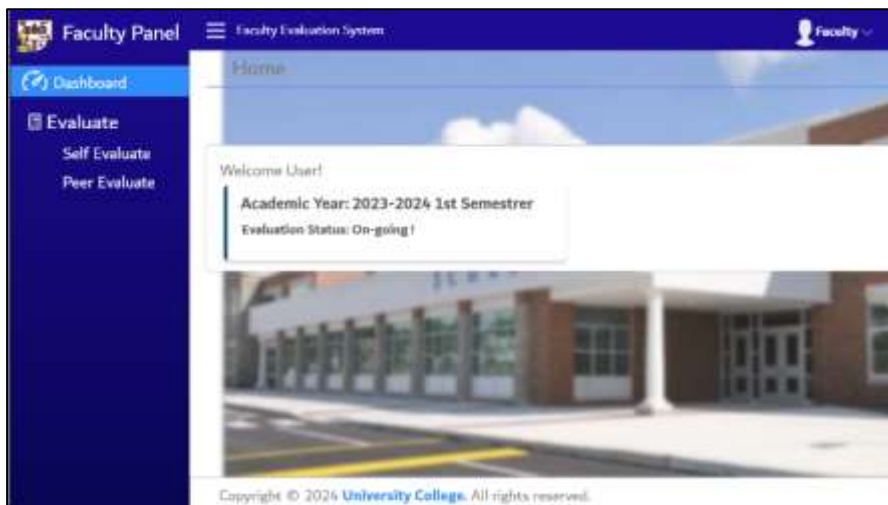


**Figure 2**. The Faculty Panel

Figure 2 showcases the Faculty Panel within the Faculty Evaluation System, designed to be a one-stop shop for faculty to conduct self-assessments and participate in peer reviews. This user-friendly interface provides functionalities tailored to faculty needs.

Figure 3 shows the Student Panel within the Faculty Evaluation System, which is designed for students to anonymously provide feedback on their instructors' teaching effectiveness for each course. This user-friendly interface empowers students to contribute to the evaluation process.
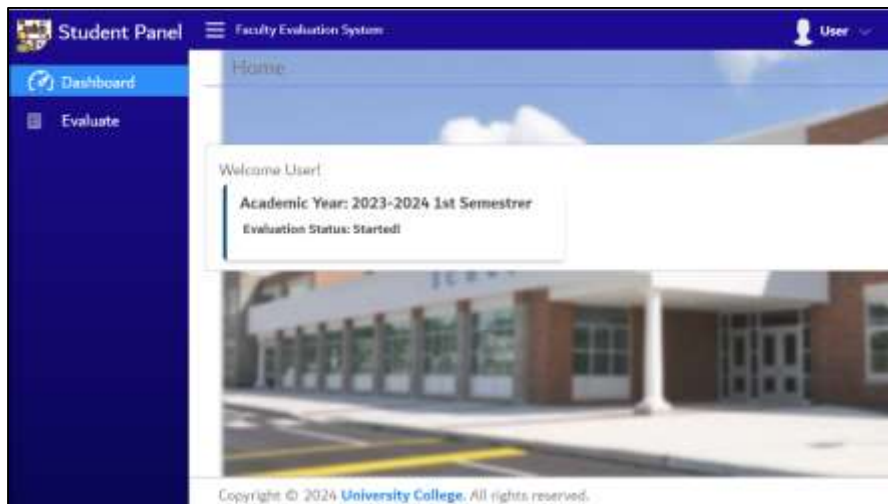
**Figure 3**. The Student Panel

As illustrated in Figures 1, 2, and 3, the Faculty Evaluation System has presented a user-friendly interface tailored to the distinct roles within the institution. This user-centric design allows faculty, administrators, and students to interact with the system intuitively. Exploring how these user interactions on the user interface (UI) translate into actionable insights. The Faculty Evaluation System follows a well-defined Input-Process-Output (IPO) model to manage data flow and generate valuable reports.
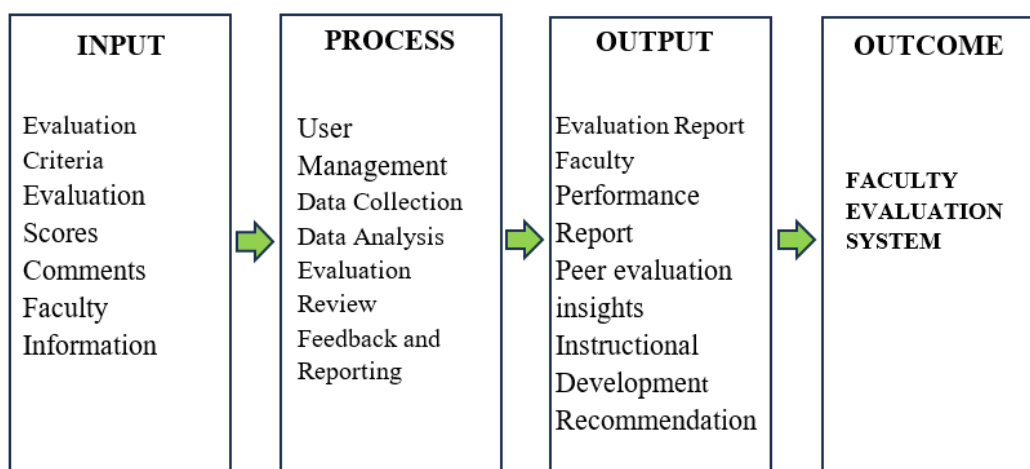


**Figure 4**. The Input-Process-Output Model of the Faculty Evaluation System

Figure 4 complements the user interface walkthrough by exploring the core functionalities of the Faculty Evaluation System. It depicts the Input-Process-Output (IPO) model, illustrating how user interactions on the user-interface (UI) translate into actionable data and reports. This diagram clarifies the types of data received from faculty self-assessment, peer review, and student feedback (optional). It then outlines the key system processes, such as user management, data analysis, and report generation. Finally, the Input-Process-Output (IPO) model highlights the various outputs delivered to different user groups, including faculty performance reports, peer evaluation insights, and instructional development recommendations.
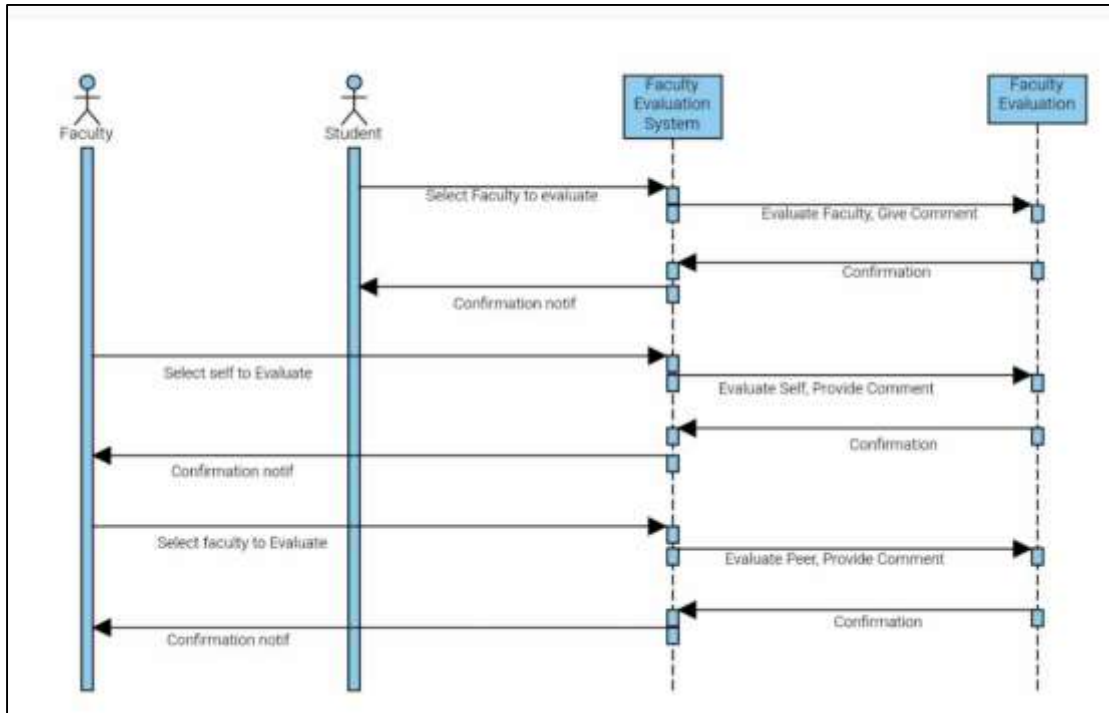
**Figure 5**. Sequence Diagram

Building upon the user interface (Figures 1-3) and the Input-Process-Output (IPO) model (Figure 4), Figure 5 presents a sequence diagram that dives deeper into the system's interaction flow during the evaluation process. This diagram focuses specifically on the interactions between students and faculty, showcasing how their actions on the UI trigger specific system functionalities. By analyzing this sequence diagram, we can visualize the step-by-step interactions involved in faculty self-assessment, peer review, and student feedback submission. This will provide a clear understanding of how the system facilitates the exchange of information and ensures anonymity for student evaluations.

This research employed a quantitative approach to evaluate the effectiveness and usability of the Web-based Faculty Evaluation System (WFES) using a well-established framework, the ISO/IEC 25010 Software Quality Model. This model provides a comprehensive set of quality characteristics that encompass various aspects of the user experience with software applications.

A convenience sampling method was used to recruit participants from Wright Technological College of Antique, Inc. The target population included faculty members, students, and staff members who would potentially interact with the Web-based Faculty Evaluation System (WFES). Participants were recruited through email invitations containing a unique link to the online survey. The email explained the purpose of the evaluation and assured participants of data anonymity and confidentiality. Informed consent was obtained electronically before participants began the survey. The survey platform recorded all responses electronically for data analysis.

Quantitative data from the Likert scale ratings for each quality characteristic was analyzed using descriptive statistics (*e.g.*, mean, standard deviation). This provided an overall picture of user perceptions regarding the system's strengths and weaknesses based on the ISO/IEC 25010 model. Qualitative data from the open-ended feedback was analyzed thematically. This involved identifying recurring themes and patterns in the responses to gain deeper insights into user experiences and specific suggestions for improvement.

The ISO/IEC 25010 model served as a structured framework for the evaluation process. It defined a set of quality characteristics categorized into different aspects like functionality, usability, reliability, and security. By mapping survey questions to these characteristics, the evaluation ensured a comprehensive assessment of the Web-based Faculty Evaluation System (WFES) from a user-centric perspective. This standardized approach facilitated objective analysis of the data and allowed for comparisons with established quality benchmarks for software applications.

By combining these data collection and analysis methods, the evaluation aimed to obtain a rich understanding of user experiences with the Web-based Faculty Evaluation System (WFES) and identify areas for improvement to enhance its overall effectiveness and user satisfaction.

## 3. Results and Discussion

The research aimed to evaluate the effectiveness and functionality of the web-based faculty evaluation system. Evaluators used a well-established framework, the ISO/IEC 25010 Software Quality Model, to assess the system based on end-user experience. Sixty students, three faculty members, and five staff members from Wright Technological College of Antique, Inc. participated in the evaluation. The evaluation of the Web-Based Faculty Evaluation System (WFES) revealed promising results, as depicted in Table 1. The overall mean rating of 4.12 indicates that the system is considered "High" in terms of user experience. The functional appropriateness score of 4.26 suggests some room for optimization in achieving its goals. Strengths include high marks for functional completeness (4.15) and correctness (4.13), ensuring the system possesses all necessary features and functions that work as intended. Performance efficiency is also strong in terms of time behavior (4.00), resource utilization scores high (4.10), suggesting potential for improvement in resource usage.

Looking at usability aspects, the system excels in user appropriateness (3.93) and learnability (4.14), indicating user comfort and a potentially easier-than-needed learning curve. However, user interface aesthetics scored moderately (3.95), highlighting an opportunity to enhance the visual appeal of the interface.

The Web-based Faculty Evaluation System (WFES) demonstrates strong functionality, with areas for improvement in resource efficiency and user interface design.

**Table 1.** Summary of Result of Ratings by Students, Faculty and Staff using ISO/IEC 25010 Model

| Characteristics | | Mean | Description |
|---|---|---|---|
| **Functional Suitability** | Functional Completeness | 4.15 | High |
| | Functional Correctness | 4.13 | High |
| | Functional Appropriateness | 4.26 | High |
| **Reliability** | Maturity | 4.10 | High |
| | Availability | 4.38 | High |
| | Fault Tolerance | 4.14 | High |
| **Performance Efficiency** | Time Behavior | 4.00 | High |
| | Resource Utilization | 4.10 | High |
| | Capacity | 4.16 | High |

| | | | |
|---|---|---|---|
| **Usability** | Performance Efficiency | 3.93 | Moderate |
| | Appropriateness | 3.93 | Moderate |
| | Learnability | 4.14 | High |
| | Operability | 4.16 | High |
| | User Error Protection | 3.89 | Moderate |
| | User Interface Aesthetics | 3.95 | Moderate |
| **Security** | Confidentiality | 4.00 | High |
| | Integrity | 4.03 | High |
| | Authenticity | 4.16 | High |
| **Compatibility** | Co-existence | 4.14 | High |
| | Interoperability | 4.13 | High |
| **Maintainability** | Reusability | 3.99 | Moderate |
| | Analyzability | 4.18 | High |
| | Modifiability | 4.09 | High |
| | Testability | 4.26 | High |
| **Portability** | Adaptability | 4.16 | High |
| | Installability | 4.56 | High |
| **Overall Mean** | | 4.12 | High |

Table 1 summarizes the results of the evaluation of the Web-based Faculty Evaluation System (WFES) at Wright Technological College of Antique, involving students, faculty, and staff, which revealed promising results based on the ISO/IEC 25010 model. The system excelled in core functionalities, scoring highly for features aligning with its purpose (functional suitability) and including all necessary functions (completeness). Performance was impressive, with a fast response time. Usability stood out as a major strength, with participants finding the system comfortable and easy to learn (high user appropriateness and learnability scores). However, there are areas for improvement that exist, such as optimizing features for better goal achievement (functional appropriateness) and improving resource efficiency. Also, enhancing the visual appeal of the user interface could further improve the user experience. In general, the WFES demonstrates potential but can be refined to maximize its effectiveness and user satisfaction. This alternative emphasizes the specific strengths (core functionalities, usability) and uses stronger verbs like "excelled" and "stood out." It also clarifies the meaning of "functional appropriateness" for better understanding.

## 4. Conclusion and Recommendations

In conclusion, the evaluation of the Web-based Faculty Evaluation System (WFES) revealed a promising foundation with exceptional strengths in usability, maintainability, security, and adaptability. However, opportunities for improvement exist in resource utilization, availability, and user interface

aesthetics. By implementing strategies to optimize resource usage and system uptime, incorporating user feedback to refine the interface design, and finding a balance between robust security and the user experience for data access, the system can reach its full potential. This will not only enhance the user experience but also contribute to a more streamlined and effective faculty evaluation process at Wright Technological College of Antique, Inc.

To ensure continued success for the web-based faculty evaluation system, we recommend a focus on optimization. This includes analyzing resource usage patterns to improve system efficiency and exploring solutions to enhance system uptime. Also, incorporating user feedback can refine the interface design for a more visually appealing experience. Finally, evaluating the balance between robust security measures and user experience regarding data access will ensure confidentiality while maintaining a user-friendly system. By implementing these recommendations, the web-based faculty evaluation system can become a highly efficient, user-centric tool that streamlines the evaluation process and fosters a positive experience for all involved at Wright Technological College of Antique, Inc.

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