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Research Article

Developing an Assessment Model of the Independent Campus Internship Program Based on an Expert System

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ABSTRACT

Improving the quality of vocational education is a critical priority to ensure that graduates possess the cognitive abilities, soft skills, and hard skills required by the modern workforce. However, significant challenges remain, such as the inability of graduates to meet workplace demands, outdated and conventional assessment methods, and the absence of expert system-based tools to evaluate the effectiveness of the Independent Learning Campus (MBKM) program. Additionally, the lack of comprehensive assessment guidelines provided by universities has further hindered the optimal implementation of this program. These issues underline the need for an innovative approach to address the gaps in assessment practices for the MBKM internship program. The objective of this research is to develop an expert system-based assessment model for the MBKM internship program that is valid, practical, and effective. The research leverages the Borg and Gall development model, focusing on creating a framework that integrates higher education assessments with industry-specific requirements. The resulting model facilitates theoretical and practical evaluations, using a website-based expert system that incorporates artificial intelligence to monitor and assess learning outcomes in real-time. The novelty of this study lies in its ability to bridge the gap between academic assessments and industry needs through an innovative, expert system-driven approach. This model provides a comprehensive assessment framework, including preparation guidelines, implementation strategies, assessment rubrics, and reporting mechanisms for lecturers, instructors, and students. By enhancing the alignment between vocational education and industry demands, this research offers a transformative contribution to the MBKM program and sets a foundation for further advancements in assessment technology.

Keywords: Assessment Model, Independent Learning Campus, Internship, MBKM, Expert System

INTRODUCTION

Improving the quality of education is really needed in vocational education to increase human resources and competitiveness, so one of the government's efforts is to launch the Independent Campus Learning (MBKM) policy, with the aim of increasing the competency abilities of graduates, both soft skills and hard skills [1-3]. In line with the findings of [4] an independent campus has a positive impact on knowledge, understanding, experience, and others. Independent Campus has elements of creativity, innovation and critical learning so that it is relevant to industry [5-6]. The Independent Campus Program takes the form of activities such as student exchanges, teaching in educational units, independent projects, certified internships, research assistantships, entrepreneurial activities, humanitarian projects, and village development projects [7-8].

Problems that occur, graduates are not yet able to be ready to work because of limited ability to meet the demands of the world of work [9]. The quality of graduates is not good [10]. It is necessary to pay attention to collaboration between universities [11-12]. Students feel that independent campus learning is not optimal because it is done online [13]. The assessment is still carried out conventionally and not based on an expert system. Other problems related to the Independent Campus: 1) Leadership policy, 2) Need for socialization, 3) Collaboration with external parties, 4) MBKM requirements and reporting, 5) Curriculum revision, 6) Selection and suitability of supervisors 7) Adjustment of recognition to courses [14]. There is a need for guidance on instructions and

implementation of MBKM including assessment [15]. Readiness studies are needed [15], one of which is in the form of an assessment. At the Merdeka Campus, there is still a need to optimize human resources, namely the ability of lecturers and there is still a lack of adequate information technology [15-18]. There are still many Independent Campus guides provided by universities that do not contain assessments.

Other problem is the assessments have not been effective yet in assessing the Merdeka Campus, [19], as well as instruments that are not appropriate, and assessments still in conventional form without a touch of technology. Meanwhile, the required assessment is technology-based [20-22]. It is necessary for lecturers to understand how to carry out Independent Campus assessments [23]. The assessment model can make it easier to carry out assessments. The key to MBKM success is learning flexibly and according to needs [24]. The development of the Independent Campus assessment model has never been carried out at UNP. Previous research was more directed towards developing evaluation of the independent learning program but not yet in the realm of assessment, so this research is relatively new in Indonesia. The importance of independent campus assessments [25-26]. The assessment is useful for assessing the adequacy of the Independent Campus program [27-28].

In this research, the researcher developed an expert system-based independent campus internship program assessment model, adapting MBKM/independent campus policies, independent campus guidelines, internship programs, adapting assessments that link and match between assessments in higher education and internships in industry, facilitating assessment in theoretical form. And practice, website-based which can be directly assessed and monitored by the Independent Campus assessment results for its internship program and is relevant to Expert System assessment with artificial intelligence technology in measuring research learning outcomes [30-31]. The findings of [32] are that the Independent Campus assessment application is clear, making assessment easier.

The research objectives are: Developing an expert system-based independent campus internship program assessment model that is valid, practical and effective.

The urgency of the research is The independent campus internship program assessment model based on an expert system was developed as a solution for assessing independent campus programs, especially internships, by containing assessment preparation, assessment implementation, assessment indicators, assessment rubik, based on an expert system, and an ideal assessment guide for internship programs for lecturers, instructors and students.

METHOD

This research uses a development research model with borg and gall. With the following stages:

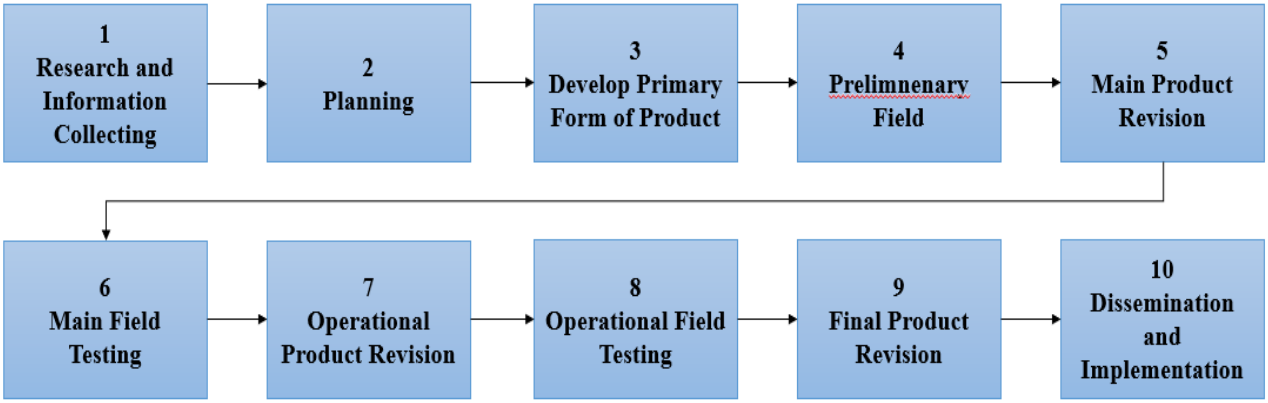

Figure 1: Development procedure [48]

However, this research is limited to adjusting the research objectives, so there are four research steps described as follows:

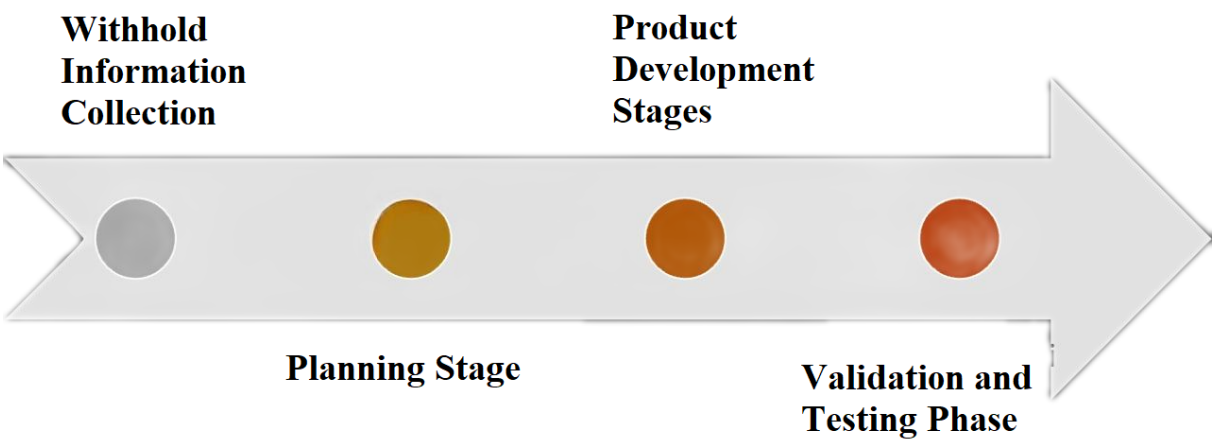

Figure 2: Development stages [39]

Subject is students and lecturers at Universitas Negeri Padang, and instructors in industry. The data collection instrument uses a questionnaire via Google Form. Data analysis techniques were carried out descriptively and inferential statistics using Structural Equation Modeling (SEM) testing and factor analysis (CFA) using the SMART PLS application.

RESULT AND DISCUSSION

The resulting assessment model scheme is as follows:

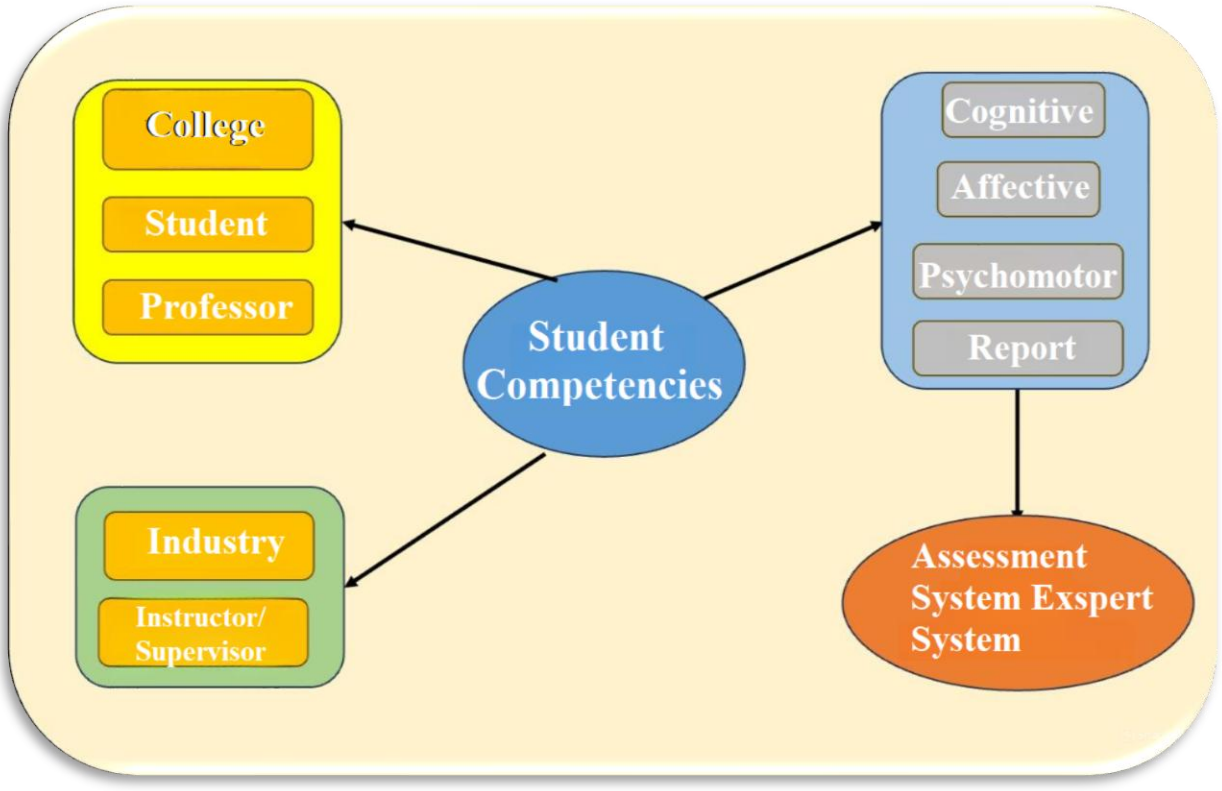

Figure 3: The Resulting Assessment Model Scheme

Validity

The validity test was carried out to determine the level of validity of the product developed in this research. Products that have been previously developed are the Independent Campus internship assessment model, lecturer's

guidebook, and student guidebook for testing small and large field models. The validity used is the accuracy of the content, with the help of experts (Validators), in accordance with experts in related fields and expert requirements.
The expert system-based assessment model was validated by 5 experts, assessing aspects such as model rationale, supporting theory, characteristics, syntax, social system, reaction principles, and supporting systems. The results, summarized in Table 1, indicate high validity across all aspects, with an average score of 0.90, confirming the model's readiness for implementation. The guidebook for the independent campus internship program also achieved a valid status with an average score of 0.88 across all criteria, including writing format, language use, introduction, content, and evaluation systems.
Relevant studies, such as Wulandari et al. (2022), emphasize the importance of valid and comprehensive evaluation tools for MBKM programs. Similarly, Narundana and Dharmawan (2022) highlight how technology-based assessments enhance the effectiveness of MBKM policy implementation, aligning well with this study's findings.

a. Model Validation

The model validity test was carried out by 5 experts, where the aspects assessed in model validation were model rationale, model supporting theory, model characteristics, model syntax, social system, reaction principle, and supporting system. Based on all these aspects, it was developed into a 36-item instrument. The following are the results of model validation.

Table 1: Expert Validation of the Model

Aspect	Average	Category
Rational Model	0.92	Valid
The Supporting Theory	0.92	Valid
Model Characteristics	0.88	Valid
Model Syntax	0.89	Valid
Social System	0.90	Valid
Reaction Principle	0.91	Valid
Support System	0.91	Valid
Average	0.90	Valid

The results of model validation in the rational aspect of the model show a value of 0.92, in the supporting theory aspect of the model it shows a value of 0.92, the characteristic aspect of the model shows a value of 0.88, model syntax with a value of 0.89, social system with a value of 0.90, reaction principles with a value of 0.91, supporting systems with a value of 0.91. So the average of all aspects is 0.90, meaning is the model declared valid for use.

1) Validation of the independent campus internship program assessment model guide based on the expert system

In the validity test of the guidebook, the independent campus internship program assessment model based on the expert system was carried out by 5 experts, where the aspects assessed are writing format, use of language, introduction, content aspects, and evaluation system. Based on all these aspects, it was developed into a 43-item instrument. The following are the results of the validation of the lecturer's guidebook.

Table 2: Expert validation of the expert system-based independent campus internship program assessment model guide

Aspect	Average	Category
Writing Format	0.89	Valid
Use of Language	0.89	Valid
Introduction	0.88	Valid
Content Aspect	0.86	Valid
Evaluation System	0.88	Valid
Average	0.88	Valid

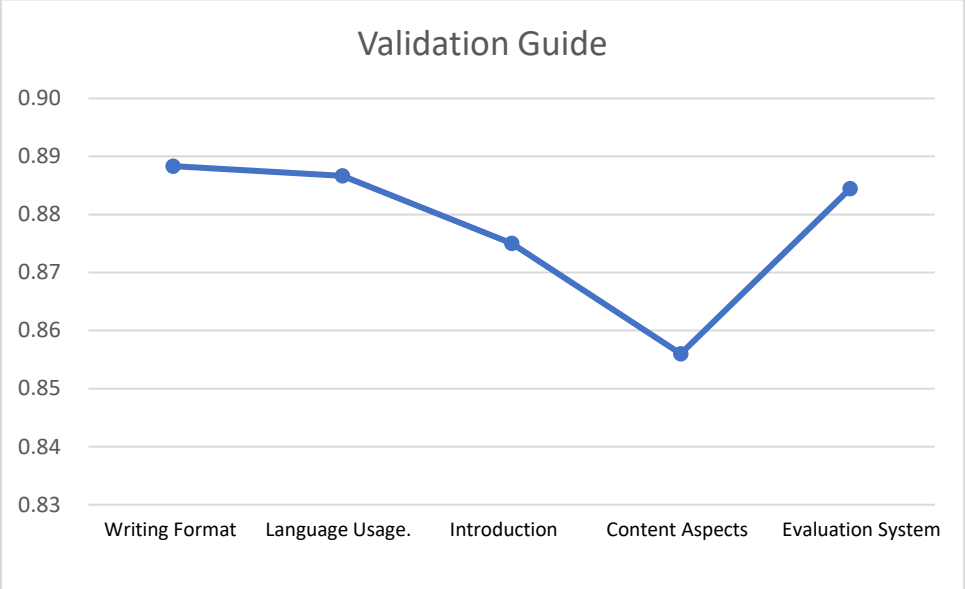

Figure 4: Guide Validation

The results of the Validation of the independent campus internship program assessment model guide based on the expert system. The writing format aspect of the model shows a value of 0.89, the language use aspect shows a value of 0.89, the introductory aspect shows a value of 0.88, the content aspect has a value of 0.86, evaluation system with a value of 0.88. So the average of all aspects is 0.88, meaning the lecturer's guidebook in the model is declared valid for use in lectures.

b. Product Validation

The product validity test was carried out by 5 experts, where the aspects assessed are the suitability of the content of the validity instrument, the suitability of the language of the validity instrument, and the suitability of the graphic aspects. Based on all these aspects, it was developed into an 18-item instrument. The following are the results of product validation on the model.

Table 3: Expert validation of products

Aspect	Average	Category
the suitability of the content of the validity instrument	0.86	Valid
the suitability of the language of the validity instrument	0.82	Valid
the suitability of the graphic aspects	0.90	Valid
Average	0.86	Valid

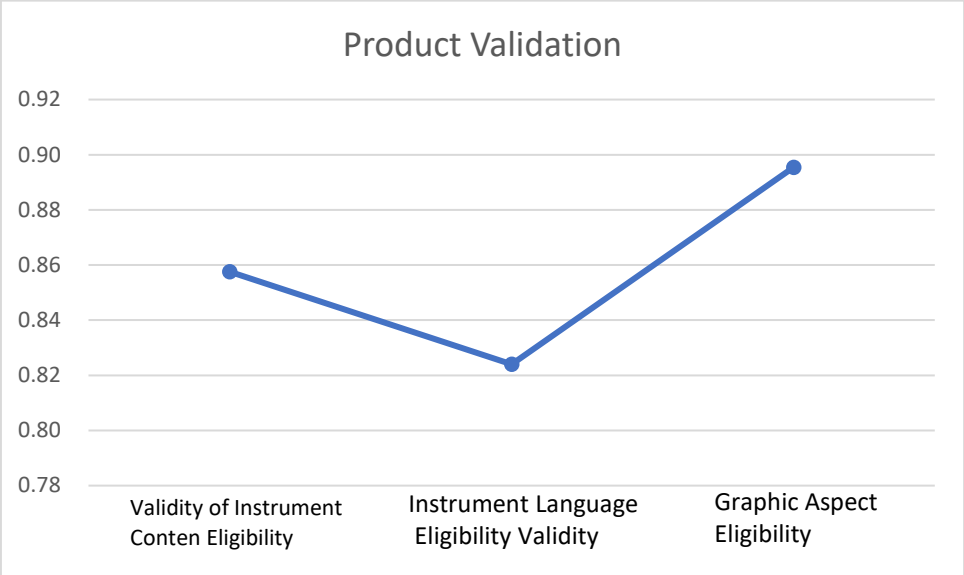

Figure 5: Product Validation

The results of product validation on the model in the content feasibility aspect show a value of 0.86, in the language feasibility aspect the validity instrument shows a value of 0.82, graphic aspect feasibility with a value of 0.90. So the average of all aspects is 0.86, meaning that the product developed in the model is declared valid for use.

2) Validation of the product practicality

Validation of the product practicality test was carried out by 5 experts, where the aspects assessed in product validation is the suitability of the content of the practicality instrument, the suitability of the language of the practicality instrument, and the suitability of the graphic aspects. Based on all these aspects, it was developed into a 15-item instrument. The following are the results of product practicality validation in the model.

Table 4: Expert validation of product practicality

Aspect	Average	Category
the suitability of the content of the practicality instrument	0.92	Valid
the suitability of the language of the practicality instrument	0.94	Valid
the suitability of the graphic aspects	0.93	Valid
rata-rata	0.93	Valid

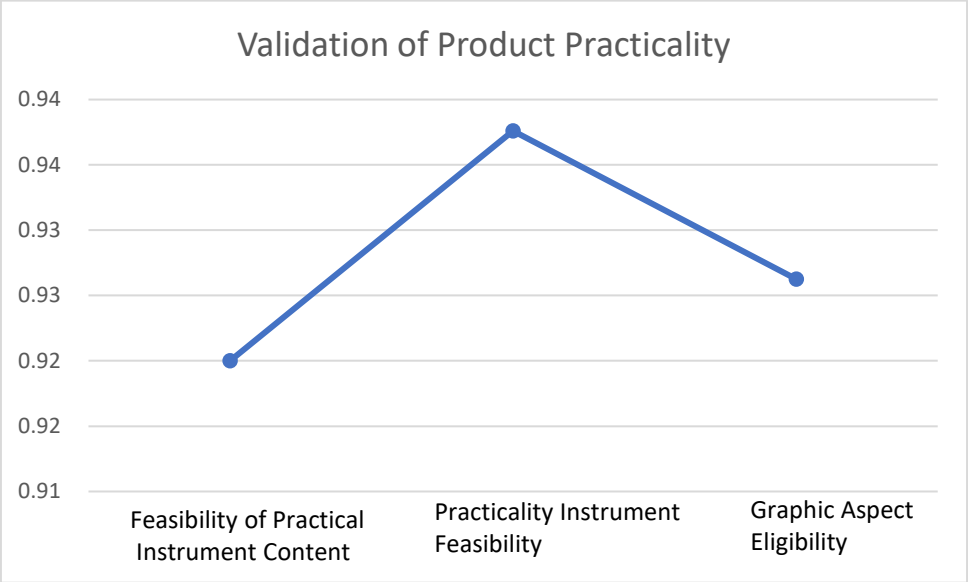

Figure 6: Validation of the product practicality

The results of product practicality validation in the model in the feasibility aspect of the content of the practicality instrument show a value of 0.92, in the feasibility aspect of the practicality instrument it shows a value of 0.94, the feasibility aspect of the graphic aspect has a value of 0.93. So the average of all aspects is 0.93, meaning that the validation of the practicality of the product developed in the model is declared valid for use.

Practicality

The practicality of the developed model was tested by conducting a practicality test. This was done to be able to answer one of the research questions. Practicality testing was carried out by distributing questionnaires to lecturers as stakeholders in model development.

The practicality test results show that the developed model is practical and user-friendly. Lecturers rated the practicality of the model and guidebook at an average score of 87.48, categorized as practical. These results are supported by Setyawati et al. (2022), who emphasized the necessity of practical assessment tools to streamline implementation in academic and industrial settings.

1) Practicality of Lecturer Responses

The practicality test instrument was given to 5 lecturers and a practical score of 87.48 was obtained in the practical category. Referring to (Purwanto, 2009) the value range of 80-89 is interpreted practically. A summary of the test results on the practicality model can be seen in the table, and in more detail in the attachment.

Table 5: Lecturer Response Practicality

Aspect	Average	Category
Practicality Model	87.08	Practical
Practicality of Guidance book	87.89	Practical
Average	87.48	Practical

Data analysis

After testing the validity and practicality which is declared valid and practiced, data analysis is carried out to see whether the hypothesis was accepted or rejected, by looking at the significance between variables, statistical values, and p-value. Using the SEM-PLS (Partial Least Squares) method, data analysis confirmed the significance of relationships between variables—cognitive, affective, and psychomotor. Each variable achieved a value above 0.5 with a p-value < 0.05, indicating strong and positive relationships. These findings align with previous studies (Santoso, 2010; Winarno, 2012) that utilized adaptive testing models to assess learning outcomes effectively.

Testing in this research was carried out using the SEM-PLS (Partial Least Square) 4.0 application. The test result values can be seen in the following bootstrapping:

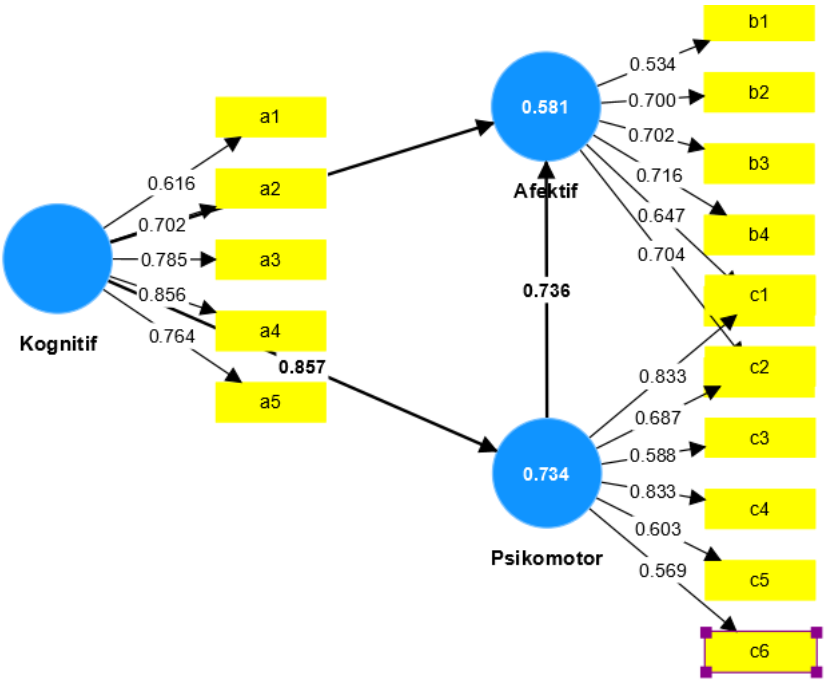

Figure 7: Image of Data Analysis Results

To analyze the causal relationship between one variable and another, here it can be seen that there are 3 variables whose hypotheses are tested, namely cognitive, affective, and psychomotor. After carrying out a significance test between variables, it can be seen above that each variable is related to the variable and the data. A value above 0.5 has meaning significant. This is proven by all variable results having a value of >0.5 and a P value of 0.000 <0.05. These results show that apart from being significant, the influence of the variables also shows a positive direction, which means that the Ha hypothesis is accepted. This study contributes to vocational education by providing a robust, technology-driven assessment framework tailored to the MBKM internship program. The integration of artificial intelligence and expert system technology represents a significant advancement, offering practical solutions to longstanding challenges in MBKM assessment. These findings align with recent trends in education, emphasizing the role of digital tools in enhancing educational effectiveness (Palm et al., 2016; Hayes et al., 2020).

CONCLUSION

This study successfully developed an expert system-based assessment model for the Independent Campus (MBKM) internship program, addressing critical gaps in current assessment practices. The developed model was validated by experts and proven to be valid, practical, and effective, with an average validity score of 0.90 and a practicality score of 87.48. Data analysis using SEM-PLS confirmed significant relationships between cognitive, affective, and psychomotor variables, demonstrating the model's capability to comprehensively assess learning outcomes in both academic and industrial contexts. The integration of artificial intelligence and website-based platforms provides a novel approach, enhancing the accuracy and efficiency of MBKM assessments. By bridging the gap between higher education and industry, this model contributes to improving graduate readiness and aligning educational outcomes with workforce demands.

To enhance the implementation and impact of this model, it is recommended that universities adopt this system as part of their MBKM evaluation framework while providing training for lecturers, instructors, and students to ensure effective usage. Policymakers should consider integrating technology-driven assessment models into MBKM guidelines to standardize practices and support broader adoption. Further research is suggested to explore the model's scalability across various disciplines and regions, as well as to incorporate additional artificial intelligence capabilities, such as predictive analytics, for enhanced functionality. Regular feedback from stakeholders should

also be collected to refine the model continuously, ensuring it remains relevant to evolving educational and industrial needs.

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