



Content Validity of Flipped Learning-Based Statistical Learning Evaluation Instruments at Tourism Colleges

Gusti Ayu Dessy Sugiharni^{1*} 

¹Prodi Kewirausahaan, Institut Pariwisata dan Bisnis Internasional, Bali, Indonesia

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ABSTRAK

Permasalahan yang terjadi adalah masih banyak peneliti yang belum memperhatikan validitas isi dari instrumen evaluasi yang digunakan dalam kegiatan evaluasi. Melihat pentingnya peran instrumen evaluasi sebagai alat ukur, maka perlu ditentukan validitas isi terhadap instrumen evaluasi tersebut. Penelitian ini bertujuan untuk menunjukkan secara detail proses perhitungan validitas isi instrumen evaluasi yang khusus digunakan dalam mengevaluasi kualitas pembelajaran statistik berbasis flipped learning pada perguruan tinggi pariwisata pasca pandemi covid-19. Jenis penelitian ini adalah pengembangan instrumen dengan menggunakan pendekatan kuantitatif. Subjek penelitian ini adalah beberapa pakar yang dilibatkan dalam pengujian validitas isi instrumen evaluasi. Jumlah pakar yang dilibatkan sebanyak 4 pakar, diantaranya: 1 pakar bidang pendidikan matematika, 1 pakar bidang pariwisata, 1 pakar bidang pendidikan teknik informatika, dan 1 pakar bidang evaluasi pendidikan. Alat yang digunakan oleh para pakar untuk menilai butir instrumen evaluasi adalah kuesioner yang terdiri dari 26 butir pertanyaan. Formula yang digunakan untuk menganalisis hasil uji validitas isi instrumen evaluasi adalah Aiken. Teknik analisis data hasil uji validitas isi dilakukan dengan cara membandingkan hasil rerata nilai V dari perhitungan formula Aiken dengan pengkategorian validitas Gregory. Hasil penelitian menunjukkan 18 butir instrumen yang valid dan 8 butir instrumen yang tidak valid. Selain itu dari hasil rerata nilai V sebesar 0,668, maka dapat dinyatakan bahwa instrumen evaluasi yang khusus digunakan dalam mengevaluasi kualitas pembelajaran statistik berbasis flipped learning pada perguruan tinggi pariwisata pasca pandemi covid-19 sudah tergolong validitas tinggi.

ABSTRACT

The problem that occurs is that there are still many researchers who have not paid attention to the content validity of the evaluation instruments used in evaluation activities. Seeing the important role of the evaluation instrument as a measuring tool, it is necessary to determine the content validity of the evaluation instrument. This study aims to show in detail the process of calculating the content validity of an evaluation instrument that is specifically used in evaluating the quality of statistical learning based on flipped learning at tourism tertiary institutions after the Covid-19 pandemic. This type of research is the development of instruments using a quantitative approach. The subjects of this study were several experts who were involved in testing the content validity of the evaluation instrument. The number of experts involved was 4 experts, including: 1 expert in mathematics education, 1 expert in tourism, 1 expert in informatics engineering education, and 1 expert in education evaluation. The tool used by experts to assess the evaluation instrument items is a questionnaire consisting of 26 questions. The formula used to analyze the results of the content validity test of the evaluation instrument is Aiken. The data analysis technique for the results of the content validity test was carried out by comparing the results of the average value of V from the calculation of the Aiken formula with the Gregory validity categorization. The results showed that 18 valid instruments and 8 invalid instruments. In addition, from the average V value of 0.668, it can be stated that the evaluation instrument specifically used in evaluating the quality of statistical learning based on flipped learning at tourism tertiary institutions after the Covid-19 pandemic is classified as high validity.

1. INTRODUCTION

After the Covid-19 pandemic, learning in most tertiary institutions including tourism universities still utilizes a combination of face-to-face and online learning models (Ekawaty, 2022; Gultom et al., 2022; Oktariantio et al., 2022; Rahayu & Yuliamir, 2022; Rohana, 2020). One of the familiar learning models used to combine face-to-face and online learning is flipped learning (Awidi & Paynter, 2019; Farida et al., 2019; Ishak et al., n.d.; Karim & Saptono, 2020; Z. Zainuddin et al., 2019). The reality that occurs in the field is that not all tertiary institutions or tourism colleges can implement flipped learning properly and optimally (Akçayır & Akçayır, 2018; Birgili et al., 2019, 2021; Bond, 2020; Fell-Kurban, 2019; Hamid & Hadi, 2020; Ramadhan et al., 2021). Therefore, it is necessary to evaluate the implementation of flipped learning

*Corresponding author.

E-mail addresses: ayudessy66@gmail.com (Gusti Ayu Dessy Sugiharni)

comprehensively in terms of context, input, process, and product domains. Efforts that need to be made early on to obtain good evaluation results are preparing good instruments. The evaluation instrument is one of the most important measuring tools that can be used in the evaluation process of an object being evaluated (Alwi & Sholihat, 2019; Bariah, 2019; Fahrurrozi & Rahmawati, 2021; Magdalena et al., 2021; Rachmawati, R. & Kurniawati, 2020; Safitri et al., 2023; Wisman et al., 2021; M. Zainuddin et al., 2020; Zamkakay, 2021; Ziliwu et al., 2022). Once the role of the instrument is important in evaluation activities, it is necessary to test the content validity of the evaluation instrument, so that the evaluation results can produce the right recommendations.

The reality on the ground shows that invalid evaluation instruments are often used in the evaluation process. Therefore, problems related to invalid evaluation instruments need to be addressed optimally through studies that show a detailed calculation process to obtain valid evaluation instruments. Based on this, the urgency of this research was that it was necessary to demonstrate the specified calculation from content validity of the evaluation instrument to produce an evaluation instrument that is reliable and ready to be used to obtain optimal evaluation results. The results of previous research show that the content validity of the assessment instrument but have not specifically shown the calculating process of content validity from the assessment instrument (Desmarais et al., 2021; Van der Put et al., 2017).

The similar research results demonstrated the content validity of online learning evaluation instruments during the Covid-19 pandemic (Satyawan et al., 2021; Wakano et al., 2021). The limitation of it was that it had not explained the specific calculation process from the results of the content validity which was shown. The previous research demonstrated the content validity of an evaluation instrument using the CIPP (Context-Input-Process-Product) model (Irawan, 2022; Ramadani et al., 2017). Limitations of it were not showing the stages and detailed calculations to obtain content validity from the evaluation instrument. Other research showed an educational program evaluation instrument but did not specifically explain the calculation process for determining the instrument content validity (Miranda, 2022; Ramadani et al., 2017). Previous research demonstrated the development of the CIPP (Context-Input-Process-Product) model evaluation instrument but did not yet in-depth prove the stages and calculation process to obtain the results of the instrument content validity (Baysha & Astuti, 2016; Winarto et al., 2021). Based on the urgency of this research and the limitations of some of the results of previous studies, the focus of this research is to show in detail the calculation process for determining the validity of the contents of the instrument. Therefore, the purpose of this study was to show specifically the calculating process from the content validity of an evaluation instrument. It was especially used in evaluating the quality of statistical learning based on flipped learning at tourism colleges after the Covid-19 pandemic.

2. METHODS

This study used an evaluation instrument development approach. The stages for developing an evaluation instrument include: 1) determining the evaluation component; 2) determining of evaluation aspects; 3) determination of the evaluation instrument items; 4) testing of the evaluation instrument items; 5) analysis of the evaluation instrument, and 6) determination of the final instrument (Hulukati & Rahmi, 2020; Jahring et al., 2022; Kurnia et al., 2022; Maulida, M. & Hamama, 2021; Sukmawati et al., 2022). The researcher identified the evaluation component in the stage of determining the evaluation component; Determined the evaluation aspects that refer to the evaluation component in the stage of determining the evaluation aspects; Made items that refer to the evaluation aspects in the stage of determining the evaluation instrument items, the instrument; And tested the content validity and reliability evaluation instruments in the testing phase of the instrument. Based on the purpose of this study, the evaluation instrument trials were focused only on content validity testing. Subjects involved in conducting the content validity test were four experts consisting of one expert in Mathematics Education, one expert in tourism, one expert in informatics engineering education, and one expert in educational evaluation. The tool used by experts to assess the evaluation instrument items was a questionnaire consisting of twenty-six questions.

In the analysis stage of the evaluation instrument, an analysis of the results from the content validity test of the evaluation instrument was carried out. It was carried out by interpreting the results of the content validity based on Guilford's content validity categorization. The results from the content validity of the evaluation instrument were obtained using the Aiken formula (Nabil et al., 2022; Ningrum et al., 2021; Widyaningsih et al., 2021). Guilford's content validity categorization can be shown in Table 1 (Divayana et al., 2021; Suciati et al., 2020).

Table 1. Content Validity Categorization Referring to Guilford

Content Validity Score Range	Categorization
$0,80 < r_{xy} \leq 1,00$	very high validity (excellence)
$0,60 < r_{xy} \leq 0,80$	high validity (good)
$0,40 < r_{xy} \leq 0,60$	moderate validity (enough)
$0,20 < r_{xy} \leq 0,40$	low validity (less)
$0,00 < r_{xy} \leq 0,20$	very low validity (bad)
$r_{xy} \leq 0,00$	invalid

3. RESULT AND DISCUSSION

Results

This study obtained results that refer to the stages of developing an evaluation instrument. Researchers especially use it to evaluate the quality of flipped learning-based statistics learning at tourism colleges after the Covid-19 pandemic. The results of this research referred to in full can be shown as follows.

Results from Determination of Evaluation Components

The evaluation component used in evaluating the quality of statistical learning based on flipped learning at tourism colleges after the Covid-19 pandemic refers to the CIPP evaluation model. The evaluation components used were context components, input components, process components, and product components.

Results of Determining Evaluation Aspects

The evaluation aspects used in evaluating the quality of statistical learning based on flipped learning at tourism colleges were obtained based on references to the CIPP evaluation components. The evaluation aspects in question can be shown in [Table 2](#).

Table 2. Evaluation Aspects from Quality of Statistical Learning Based on Flipped Learning at Tourism Colleges Post the Covid-19 Pandemic

Evaluation Component	Evaluation Aspects
Context	CN1. Regulation from the existence of flipped learning-based statistical learning at tourism colleges CN2. The purpose of organizing flipped learning-based statistical learning at tourism colleges CN3. The vision of organizing flipped learning-based statistical learning at tourism colleges CN4. The mission of organizing flipped learning-based statistical learning at tourism colleges CN5. Flipped Learning-based statistical learning system development team academic qualifications at tourism colleges CN6. The support of the academic community for the existence of flipped learning-based statistical learning at tourism colleges
Input	IN1. A clear organizational structure regarding the parties responsible for organizing flipped learning-based statistical learning at tourism colleges IN2. Readiness of the lecturer's abilities and students in implementing flipped learning-based statistical learning at tourism colleges IN3. Readiness of the development team's ability when organizing flipped learning-based statistical learning at tourism colleges IN4. Readiness of funds from tourism colleges in organizing flipped learning-based statistical learning IN5. Readiness of facilities and infrastructure from tourism colleges in organizing flipped learning-based statistical learning
Process	PC1. The process of preparing and sharing learning materials based on flipped learning statistics at tourism colleges PC2. The process of preparing the abilities of lecturers and students in technical

	operational learning statistics based on flipped learning at tourism colleges
	PC3. The process of controlling budget management in the implementation of flipped learning-based statistical learning at tourism colleges
Product	PR1. Cognitive abilities of students after carrying out flipped learning-based statistical learning at tourism colleges
	PR2. Students' affective abilities after carrying out flipped learning-based statistical learning at tourism colleges
	PR3. Students' psychomotor abilities after carrying out flipped learning-based statistical learning at tourism colleges

Results from Determination of Evaluation Instrument Items

The evaluation instrument items used in evaluating the quality of statistical learning based on flipped learning at tourism colleges were obtained based on references to the evaluation aspects of CIPP. The evaluation items in question can be shown in [Table 3](#).

Table 3. Items for Evaluation from the Quality of Statistical Learning Based on Flipped Learning in Post-Covid-19 Pandemic Tourism Colleges

Evaluation Aspects Code	Instrument Items
CN1	BCN1. Are there clear regulations regarding the existence of flipped learning-based statistical learning at tourism colleges?
CN2	BCN2. Is the purpose of implementing flipped learning-based statistical learning at tourism colleges well-socialized to students?
CN3	BCN3. Has the vision of organizing flipped learning-based statistical learning at tourism colleges been well-socialized to students?
CN4	BCN4. Has the mission of organizing flipped learning-based statistical learning at tourism colleges been well-socialized to students?
CN5	BCN5. Is the academic qualification of the team developing a statistical learning system based on flipped learning at a tourism college at least a bachelor's degree?
	BCN6. Are the academic qualifications of the team developing a statistical learning system based on flipped learning at a tourism college in accordance with their area of expertise?
CN6	BCN7. Is the support of the academic community for the existence of flipped learning-based statistical learning at tourism colleges already evident?
IN1	BIN1. Has there been a clear organizational structure regarding the parties responsible for implementing flipped learning-based statistical learning at tourism colleges?
IN2	BIN2. Is the ability of lecturers and students when implementing flipped learning-based statistical learning at tourism colleges competent?
IN3	BIN3. Is the ability of lecturers and students when organizing flipped learning-based statistical learning at tourism colleges adequate?
	BIN4. Is the readiness of the development team's ability to implement flipped learning-based statistical learning at tourism colleges to the maximum?
	BIN5. Has the readiness of the development team's ability to implement flipped learning-based statistical learning at tourism colleges been tested?
IN4	BIN6. Is the readiness of funds from tourism colleges when implementing flipped learning-based statistical learning sufficient?
	BIN7. Is the readiness of funds from tourism colleges when organizing flipped learning-based statistics learning already well prepared?
	BIN8. Has there been funding from tourism colleges in organizing flipped learning-based statistics learning from the start?
IN5	BIN9. Are the facilities and infrastructure of the tourism college in organizing flipped learning-based statistical learning properly prepared?
	BIN10. Have the facilities and infrastructure of the tourism college in organizing flipped learning-based statistical learning been there since the beginning?
PC1	BPC1. Has the process of preparing and sharing learning materials based on flipped learning statistics been going well at tourism colleges?

Evaluation Aspects Code	Instrument Items
PC2	BPC2. Is the process of preparing the abilities of lecturers and students in the operational technicalities of flipped learning-based statistical learning at tourism colleges well prepared?
PC3	BPC3. Is the control process in managing the budget for the implementation of flipped learning-based statistical learning at tourism colleges running well?
PR1	BPR1. Has there been an increase in students' cognitive abilities after carrying out flipped learning-based statistical learning at tourism colleges? BPR2. Can the cognitive abilities of students after carrying out flipped learning based on statistical learning at tourism colleges be able to train their higher-order thinking skills?
PR2	BPR3. Has there been an increase in the affective abilities of students after carrying out flipped learning-based statistical learning at tourism colleges? BPR4. Are the affective abilities of students after carrying out flipped learning-based statistical learning at tourism colleges already able to train their positive character?
PR3	BPR5. Does the psychomotor ability of students after carrying out flipped learning-based statistical learning at tourism colleges show high performance? BPR6. Has there been an increase in the psychomotor abilities of students after carrying out flipped learning-based statistical learning at tourism colleges?

Try out the evaluation instrument items

The trials of the evaluation instrument items were carried out by four experts consisting of an expert in the field of mathematics education, an expert in the field of tourism, an expert in the field of informatics engineering education, and an expert in the field of educational evaluation. The results of testing the evaluation instrument items can be seen in full in [Table 4](#).

Table 4. Test Results for Evaluation Instrument Items

No Butir	Expert				S ₁	S ₂	S ₃	S ₄	ΣS	V	Category Validitas
	1	2	3	4							
BCN1	5	4	4	5	4	3	3	4	14	0.875	very high
BCN2	4	4	5	4	3	3	4	3	13	0.813	very high
BCN3	4	5	4	4	3	4	3	3	13	0.813	very high
BCN4	4	4	5	4	3	3	4	3	13	0.813	very high
BCN5	2	3	2	2	1	2	1	1	5	0.313	low
BCN6	5	4	5	5	4	3	4	4	15	0.938	very high
BCN7	4	4	4	4	3	3	3	3	12	0.750	high
BIN1	4	5	4	5	3	4	3	4	14	0.875	very high
BIN2	4	5	4	4	3	4	3	3	13	0.813	very high
BIN3	2	2	3	2	1	1	2	1	5	0.313	low
BIN4	4	5	5	4	3	4	4	3	14	0.875	very high
BIN5	3	2	2	1	2	1	1	0	4	0.250	low
BIN6	4	5	5	5	3	4	4	4	15	0.938	very high
BIN7	5	5	4	5	4	4	3	4	15	0.938	very high
BIN8	2	2	3	2	1	1	2	1	5	0.313	low
BIN9	4	4	4	5	3	3	3	4	13	0.813	very high
BIN10	2	2	1	2	1	1	0	1	3	0.188	very high
BPC1	5	4	5	4	4	3	4	3	14	0.875	very high
BPC2	4	4	4	4	3	3	3	3	12	0.750	high
BPC3	5	4	5	5	4	3	4	4	15	0.938	very high
BPR1	4	5	4	4	3	4	3	3	13	0.813	very high
BPR2	2	1	2	2	1	0	1	1	3	0.188	very high
BPR3	5	4	5	5	4	3	4	4	15	0.938	very high
BPR4	2	2	1	2	1	1	0	1	3	0.188	very low
BPR5	1	2	2	3	0	1	1	2	4	0.250	low
BPR6	4	4	4	5	3	3	3	4	13	0.813	very high
Means V										0.668	High

Evaluation Instrument Analysis

Based on the test results of the evaluation instrument items shown in [Table 4](#), it can be determined that the interpretation results refer to the Guilford content validation categorization. The interpretation results state that the content validity of the evaluation instrument is included in the high category because the average value of V was 0.668 which was in the validity score range of $0,60 < r_{xy} \leq 0,80$.

Final instrument

Based on the results of the instrument analysis, there are 18 valid instruments and eight invalid instruments. Invalid items are BCN5, BIN3, BIN5, BIN8, BIN10, BPR2, BPR4, and BPR5 items, while valid items are all other items besides the eight items mentioned above. The instrument for evaluating the quality of statistical learning based on flipped learning at tourism colleges after the Covid-19 pandemic which was final can be seen fully in [Table 5](#).

Table 5. Items for Evaluation of the Quality of Statistical Learning Quality Based on Flipped Learning in Post-Covid-19 Pandemic Tourism Colleges which were Final

Instrument Items Code	Instrument Items
BCN1	Are there clear regulations regarding the existence of flipped learning-based statistical learning at tourism colleges?
BCN2	Is the purpose of implementing flipped learning-based statistical learning at tourism colleges well-socialized to students?
BCN3	Has the vision of organizing flipped learning-based statistical learning at tourism colleges been well-socialized to students?
BCN4	Has the mission of organizing flipped learning-based statistical learning at tourism colleges been well-socialized to students?
BCN5	Are the academic qualifications of the team developing a statistical learning system based on flipped learning at a tourism college by their area of expertise?
BCN6	Is the support of the academic community for the existence of flipped learning-based statistical learning at tourism colleges already evident?
BIN1	Has there been a clear organizational structure regarding the parties responsible for implementing flipped learning-based statistical learning at tourism colleges?
BIN2	Is the ability of lecturers and students when implementing flipped learning-based statistical learning at tourism colleges competent?
BIN3	Is the readiness from the ability of the development team to implement flipped learning-based statistical learning at tourism colleges to the maximum?
BIN4	Is the readiness of funds from tourism colleges when implementing flipped learning-based statistical learning sufficiently?
BIN5	Is the readiness of funds from tourism colleges when organizing flipped learning-based statistics learning already well prepared?
BIN6	Are the facilities and infrastructure of the tourism college in organizing flipped learning-based statistical learning rightly prepared?
BPC1	Has the process of preparing and sharing learning materials based on flipped learning statistics been going well at tourism colleges?
BPC2	Is the process of preparing the abilities of lecturers and students in the operational technicalities of flipped learning-based statistical learning at tourism colleges well prepared?
BPC3	Is the control process in managing the budget for the implementation of flipped learning-based statistical learning at tourism colleges running well?
BPR1	Has there been an increase in students' cognitive abilities after carrying out flipped learning-based statistical learning at tourism colleges?
BPR2	Has there been an increase in the affective abilities of students after carrying out flipped learning-based statistical learning at tourism colleges?
BPR3	Has there been an increase in the psychomotor abilities of students after carrying out flipped learning-based statistical learning at tourism colleges?

Discussion

As seen in Table 4, the values S1 to S4 were obtained by subtracting the score given by each expert with a value of 1. The value of ΣS was obtained by adding up all the values S1 to S4. The value of V was obtained by dividing the value of ΣS by the multiplication of the number of experts and the number of choice scores that have been reduced by 1. This study showed the stages of the process of calculating the content validation of the evaluation instrument. It is the novelty of this research. The contribution from this research results to the field of education is to contribute ideas in showing the stages. It is the stage of calculating process from the content validation of the evaluation instrument. It will later make it easier for evaluators to check the validity of the evaluation instruments used in the evaluation process of an object being evaluated.

The results of this study answered the limitations of Gaol et al.'s research, which only involved three experts when testing the instrument validity. While in this study were involved four experts. The results of this study have also answered the other research constraints which stated that has not shown the calculation stages to obtain the results of the instrument's content validity (Desmarais et al., 2021; Irawan, 2022; Wakano et al., 2021). Even though it has been able to answer some of the constraints/limitations of previous research, this research also has obstacles. The obstacle of this study is the presentation of the instrument items is still not in digital format. So it is difficult to be accessed anytime and anywhere by the evaluators.

4. CONCLUSION

This research has succeeded demonstrate the calculation process in determining the content validity of an evaluation instrument for evaluating the quality of statistical learning based on flipped learning at tourism colleges after the Covid-19 pandemic. The findings of this study are the process of calculating the content validity of a statistical learning evaluation instrument based on flipped learning at post-covid-19 tourism colleges using the Aiken formula by the results showing an average V of 0.668. Based on this average value, the content validity of this evaluation instrument is classified as high, so that the evaluation instrument can be used to evaluate evaluation objects on a wider scale. Future work that can be done to overcome the obstacles in this research is to use the Wondershare application to package the flipped learning-based statistical learning quality evaluation instruments at these tourism colleges into digital form so that they are more easily accessible to evaluators. The meaning and implications of this research have a positive impact as a reference for evaluators in determining and using evaluation instruments carefully and with accurate calculations in the evaluation process so that the evaluation results can be more optimal and valid.

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