Empowering Student Voices: Creating a Student-Centric Academic Satisfaction Assessment Tool

1st Aidan Eka Prasojo
Data Science Program,
School of Computer Science
Bina Nusantara University
Jakarta, Indonesia 11480
aidan.prasojo@binus.ac.id

2nd Favian HN Adrian
Data Science Program
School of Computer Science
Bina Nusantara University
Jakarta, Indonesia 11480
favian.adrian@binus.ac.id

3rd Salomo Hendrian Sudjono
Data Science Program
School of Computer Science
Bina Nusantara University
Jakarta, Indonesia 11480
salomo.sudjono@binus.ac.id

4th Anita Rahayu.
Computer Science Department,
School of Computer Science
Bina Nusantara University
Jakarta, Indonesia 11480
anitarahayu@binus.ac.id

5th Ienneke Indra Dewi
Quality Management Center,
Faculty of Humanities
Bina Nusantara University
Jakarta, Indonesia 11480
ienneke.dewi@binus.ac.id

***Abstract*—Academic institutions must prioritize student satisfaction to ensure a successful learning environment. This dynamic process is influenced by institutional characteristics and students'' perceptions of the learning environment. By offering high-quality programs and resources, institutions can improve instruction and support services while considering the impact of student involvement and various variables ion their overall experience. This study aims to develop a tool for measuring student academic satisfaction, with a specific focus on teacher engagement and the effectiveness of the Learning Management System (LMS). Primary data was gathered from Data Science and Computer Science students at Binus Kemanggisan B25 using a 4-point Likert scale and a questionnaire. To ensure the reliability and validity of the tool, rigorous reliability and validity tests were conducted. We distributed the questionnaire and successfully obtained the predetermined number of responses, which constitutes our sample. Subsequently, the collected data underwent rigorous analysis using reliability and validity tests to assess the effectiveness and accuracy of our proposed measurement tool. The validity test of each question is presented in the corresponding tables. The proposed measurement tool consisting of15 valid questions yields moderate reliability scores. However, it has only been tested at our university and cannot be applied to other universities. It is recommended to try another sample to ensure its relevance and accuracy.**

Keywords—Student Experience Survey, Academic Satisfaction, Learning Management System (LMS), Academic institution, Student Feedback.

I. INTRODUCTION

Academic institutions worldwide strive to provide their students with the best possible learning experience. The satisfaction of a student's academic experience is a crucial factor in determining the success of educational institutions. Academic satisfaction is a dynamic process that can be influenced by the institution's characteristics within its educational context as well as by how students themselves perceive and understand their learning environment, this can involve a range of strategies, from providing high-quality academic programs and resources to creating a supportive and inclusive academic institution culture that values student success [2]. Academic satisfaction is strongly correlated with the quality of students' learning, students are more likely to be fully engaged in their coursework, participate actively in class, and look for opportunities for additional learning and growth when they are satisfied with their academic experience [3]. It gives institutions crucial information they need to improve the standard of their instruction and support services. Additionally, academic experience helps us have a better understanding of what it was like to attend university from a variety of perspectives [4]. To guarantee that the appropriate components of students' experiences are being measured, we must engage with students more effectively if we hope to meaningfully and continuously improve the student experience [5]. Instead of taking counterproductive measures that impede creativity or limit curriculum content, we must work to better comprehend student involvement and the variables that influence it. By prioritizing student involvement, educators can help create a more dynamic and innovative academic experience [5]. A national survey that looks at several areas of students' experiences, such as teaching quality, evaluation and feedback, and general satisfaction, is the Postgraduate Taught Experience Survey (PTES) in the UK [6]. We may learn more about how student behavior affects the educational process by evaluating data on student satisfaction [7]. Researchers believe that when teachers are invested in their students, manage the classroom well, clarify difficult concepts, present challenges, make classes engaging, consult with students, and consolidate lessons to ensure learning coherence, students will learn more deeply and comprehensively [8]. Providing students detailed feedback can also help them learn better because it enables them to see where they can do better in their studies [9].

In this study, we'll make a measurement tool to identify the student's academic satisfaction. The measurement tool contains several indicators that refer to student academic satisfaction. From this study we can evaluate the data through the measurement tool to gain the benefit such as identifying areas where improvement is needed in their studies.

II. STATE OF THE ART

The level of academic satisfaction among students can have a significant impact on the quality of their learning experience. In a study conducted by Ramos et al. with nursing students still in their academic program, a strong correlation was found between academic satisfaction and the overall

XXX-X-XXXX-XXXX-X/XX/$XX.00 ©20XX IEEE

quality of student learning. These findings highlight the importance of considering factors that contribute to student satisfaction when evaluating and improving the quality of education. This study, using Academic Experience Satisfaction Scale (AESS) for data collection instruments. This 35-item scale examined the level of academic satisfaction of higher education students and covered three areas: course satisfaction, opportunity for growth, and institution satisfaction. These areas were measured using a five-point Likert scale, with the options "Totally dissatisfied", "Little satisfied", "Not dissatisfied/not satisfied", "Satisfied," and "Totally satisfied". The tool also includes sociodemographic and academic factors as part of its original subject characterization. The following inclusion criteria were established for the study's sample of 170 students, who were enrolled from the first to the ninth semester: being enrolled in an undergraduate nursing program and present in the classroom when the data were collected. Based on this study, we think one of their factors can be applied for our study, the factor is satisfaction with the course. Likert scale is useful to measure student satisfaction, we decided to implement that scale to our study, but we modified the scale from 5 to 4. The modified likert scale aims to prevent respondents from picking the middle option or neutral option. Neutral options will not be meaningful in our study, because we find it difficult to measure satisfaction, it can be a little bit satisfied or a little bit dissatisfied [2]. The limitations of this study included its performance with a specific population of a public university in southern Brazil, which did not allow for a generalization of results.

III. SUPPORTING THEORY

There are several theories that can be applied in this study. One of them is attribution theory as in Sandra Graham's 1997 study. The theory explains how people make judgments about the causes of events and behaviors. The theory suggests that individuals attribute causality to events based on certain rules, including consistency, distinctiveness, and consensus. In the achievement domain, success and failure are often attributed to ability and effort. The theory proposes that individuals undertake a causal search to determine why an outcome occurred, particularly if it was negative or unexpected. The results of this search influence personal motivation and social motivation [10]. So, this theory suggests that students' satisfaction is influenced by their perceptions of the causes of their academic experience. For example, if students attribute their success to their own abilities and effort, they are more likely to be satisfied with their academic experience. On the other hand, if they attribute their success or failure to external factors, such as luck or the quality of teaching, they may be less satisfied.

Other theories such as service quality theory which is often used in the business world can also be applied to this study. In marketing, a crucial aspect for business development and service management involves comprehending customer needs, evaluations, and desires. Customer satisfaction plays a significant role as it drives loyalty, repurchase intention, and word-of-mouth recommendations. To excel in service provision and achieve customer satisfaction, firms must grasp customers' experiences and perceptions of the services they employ. This understanding enables institutions to retain existing customers and attract new ones [11]. Drawing from the aforementioned theory, we will evaluate students' academic experience based on the quality of services provided by the institution, which encompasses teaching, facilities, and administrative support. Consequently, institutions that deliver high-quality services are more likely to cultivate satisfied students.

In summary, this theory is applied in several academic aspects in the hope that students will be satisfied in their academic life.

IV. METHODOLOGY

In this study, we make measurement tool to measure student academic satisfaction. Hence, we need parameters to support the measurement tool to perform accurately. Based on the research that we have found, student academic satisfaction can be measured with teacher engagement in their coursework [12]. On the other hand, student academic satisfaction can be assessed by evaluating the Learning Management System (LMS) they utilize throughout the academic year. An LMS serves as a platform that facilitates communication, provides access to academic information, and offers various resources pertinent to their studies [13]. As a result, students benefit from improved convenience and efficiency in their learning process, ultimately leading to increased satisfaction in their academic pursuits

Not only that, we think that student academic satisfaction is not only from the teacher engagement factor. N. Jonathan and B. Alexis have proven that detailed feedback from teachers can also help students learn better in studies [14]. In that case, the quality of the teacher can also be used as a measurement parameter for student academic satisfaction.

Before measuring students' academic satisfaction, we establish a basis for measurement using specific parameters, which serve as recognized indicators. These indicators are represented by statements that respondents can answer using a Likert scale. In our study, we utilized a 4-point Likert scale consisting of the following options: “Strongly not agree”, “Not agree”, “Agree”, and “Strongly agree”. To collect responses, we employed a questionnaire distributed via Google Forms.

Our target respondents were students from the Data Science and Computer Science programs at Binus Kemanggisan B25. We chose these specific programs to determine whether our academic experiences aligned or differed from those of other students at Binus Kemanggisan. Thus, we opted to gather primary data through the questionnaire.

To ensure a representative sample, we aimed to include students from each major. Conducting the survey online via a questionnaire format allowed us to collect data efficiently and quickly on a larger scale. Considering Roscoe's (1975) guidelines for determining sample size, we selected 30 respondents for each major. According to Roscoe, most behavioral investigations should have a sample size of at least 30 but no more than 500 to avoid Type II errors [15].

To measure whether the measurement tool is reliable and valid, we use reliability test and validity test. In the validity test, we must know the correlation between the respondent for each question and total each respondent in each question.

$$r = \frac{\sum_{i=1}^{n} (x_i - \underline{x})(y_i - \underline{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \underline{x})^2} \sqrt{\sum_{i=1}^{n} (y_i - \underline{y})^2}} \quad (1)$$

Where ,

- r = correlation coefficient.
- x_i = values of the x-variable in a sample.
- $\bar{x}$ = mean of the values of the x-variable.
- y_i = values of the y-variable in a sample.
- $\bar{y}$ = mean of the values of the y-variable.

Another thing that is important to use reliability test, is R_{table} value. R table value commonly used for threshold value. After we get the correlation for each question, we compare the correlation value with a threshold value.

- If correlation > R_{table}. Then, the question is valid for measurement.
- If correlation < R_{table}. Then, the question is not valid for measurement.

The R_{table} value that we considered is 0.2542. That number get from the R_{table} with a 5% significance level, because it is commonly used in educational institutions.

Reliability test used to measure how good the questionnaire is to rely on. In this study, we used the alpha cronbach value as a reliability value reference. Alpha cronbach value gain from the formula below, define as r_x.

$$\alpha = \left(\frac{n}{n-1}\right)\left(1 - \frac{\sum_{i=1}^{n} \sigma_i^2}{{\sigma_x}^2}\right) \quad (2)$$

where,

- α = lower-bound estimate of the true reliability
- n = n is the number of items in test X
- σ_t^2 = is the variance of item i.
- ${\sigma_x}^2$ = is the observed score variance of test X

From the α value we can conclude that our measurement tool is reliable or not, based on the requirement below [16].

- $\alpha < 0.5$, then the reliability value is low.
- $0.5 \leq \alpha \leq 0.8$, then the reliability value is moderate.
- $\alpha \geq 0.8$, then the reliability value is high.

V. RESULT & DISCUSSION

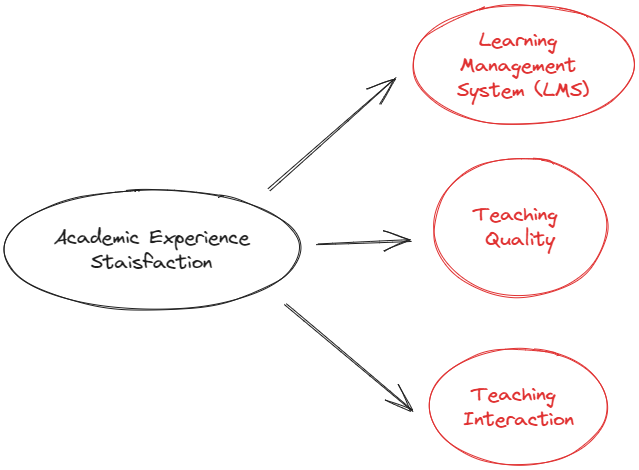

Fig. 1. Endogenous Latent and Exogenous Latent

Our measurement tool contains 3 latent to measure academic experience satisfaction. In this study, we used initial for each latent and each question to make it easier in writing, initial detail as shown below.

TABLE 1. LATENT INITIAL

latent	Initial
Learning Management System	LMS
Teaching Quality	TQ
Teaching Interaction	TI

A. *Learning Management System (LMS)*

Learning Management System, also known as LMS, is an application software designed to support a students' learning process. LMS provides students with essential academic resources, such as administration, training events, reporting, and various other academic matters. In this context, the utilization of LMS contributes to an enhanced student experience, as it simplifies their academic journey and promotes greater satisfaction[13][17].

1) *Course content management*

Course content management refers to the process of organizing, creating, storing, and managing the educational materials and resources used in a course or learning program [18].

a) Learning management systems can be easily navigated when acquiring information.

b) Learning management system provides adequate course materials that result in an effective learning process.

TABLE 2. LMS COURSE CONTENT MANAGEMENT QUESTION INITIAL

Question	Initial

Learning management systems can be easily navigated when acquiring information.	LMS 1a
Learning management system provides adequate course materials that result in an effective learning process.	LMS 1b

2) Communication and collaboration

Communication and collaboration refer to the features and tools available within the system that facilitate interaction and cooperation among instructors and students [19].

a) Learning management system provides communication tools such as discussion boards, chat functions, etc. that promotes collaborative learning and discussion among students.
b) Learning management system supports group or collaborative work.

TABLE 3. LMS COMMUNICATION AND COLLABORATION QUESTION INITIAL

Question	Initial
Learning management system provides communication tools such as discussion boards, chat functions, etc. that promotes collaborative learning and discussion among students.	LMS 2a
Learning management system supports group or collaborative work.	LMS 2b

3) Accessibility

Accessibility refers to the extent to which the system and the learning content it delivers are inclusive and usable by individuals with disabilities or diverse needs [20].

a) Learning management system is easily accessible by students with disabilities or special needs.
b) Instructors or technical support staff are capable of swiftly handling reported technical difficulties within the learning management system.

TABLE 4. LMS ACCESSIBILITY QUESTION INITIAL

Question	Initial
Learning management system is easily accessible by students with disabilities or special needs	LMS 3a
Instructors or technical support staff are capable of swiftly handling reported technical difficulties within the learning management system	LMS 3b

TABLE 5. LMS QUESTION VALIDITY TEST

Question	Correlation	R_{table}	Conclusion
LMS 1a	0.57	0.2542	Valid
LMS 1b	0.64	0.2542	Valid
LMS 2a	0.69	0.2542	Valid
LMS 2b	0.50	0.2542	Valid
LMS 3a	0.62	0.2542	Valid
LMS 3b	0.55	0.2542	Valid

B. Teaching Quality

Historically, teaching quality has been variously defined as knowing subject matter, getting high grades or test scores, being compliant and obedient, or being enthusiastic in the classroom, individual qualities assumed to be related to student learning that are not necessarily associated with specialized training for the craft of teaching [21].

1) Classroom management

Classroom management focuses on creating and maintaining a positive and productive learning environment [22].

a) Lecturers promote critical thinking, discussion, and collaboration among students.
b) Lecturers are capable of class management and maintaining a positive and respectful learning environment.

TABLE 6. TEACHING QUALITY CLASSROOM MANAGEMENT QUESTION INITIAL

Question	Initial
Lecturers promote critical thinking, discussion, and collaboration among students	TQ 1a
Lecturers are capable of class management and maintaining a positive and respectful learning environment	TQ 1b

2) Lecturer's teaching ability

Lecturer's teaching ability refers to the lecturer's proficiency, competence, and effectiveness in delivering educational content and facilitating student learning [23].

a) Lecturers expose students to real-world examples, case studies, and hands-on activities as means of improving course mastery.

b) Lecturers teach course materials in a clear and accurate manner.

TABLE 7. TEACHING QUALITY LECTURE TEACHING QUALITY QUESTION INITIAL

Question	Initial
Lecturers expose students to real-world examples, case studies, and hands-on activities as means of improving course mastery.	TQ 2a
Lecturers teach course materials in a clear and accurate manner.	TQ 2b

TABLE 8. TEACHING QUALITY LATENT VALIDITY TEST

Question	Correlation	R_{table}	Conclusion
TQ 1a	0.76	0.2542	Valid
TQ 1b	0.55	0.2542	Valid
TQ 2a	0.74	0.2542	Valid
TQ 2b	0.75	0.2542	Valid

C. *Teaching Interaction*

Teaching is an intricate process that revolves around the dynamic interaction between the teacher and the students. Central to this interaction is the undeniable necessity for the teacher to wield authority and power within the classroom. As the facilitator of knowledge, the teacher's power is essential in maintaining order, establishing boundaries, and guiding the learning experience effectively. Without this authoritative presence, it becomes increasingly challenging to navigate the complexities of the educational environment, making it imperative that an individual possesses the power of a teacher to fulfill their role effectively [24].

1) Student Engagement

Student engagement refers to the extent to which students actively participate, invest their attention, and are intellectually and emotionally involved in the learning process during interactions with the teacher [25].

a) Lecturers use humor and other engaging techniques to keep students interested and motivated.

b) Lecturers actively listen to students, address their questions and concerns, and value their feedback.

c) Lecturers encourage diverse perspectives by actively engaging students in discussions.

TABLE 9. TEACHING INTERACTION STUDENT ENGAGEMENT QUESTION INITIAL

Question	Initial
Lecturers use humor and other engaging techniques to keep students interested and motivated	TI 1a
Lecturers actively listen to students, address their questions and concerns, and value their feedback.	TI 1b
Lecturers encourage diverse perspectives by actively engaging students in discussions.	TI 1c

2) Teacher Feedback

Teacher feedback refers to the information, guidance, and evaluation provided by teachers to students regarding their performance, progress, and learning outcomes [26].

a) Lecturers offer constructive feedback and opportunities for improvement on student work, promoting student success.

b) Lecturers are approachable and willing to offer extra help or support to students in need.

TABLE 10. TEACHING INTERACTION TEACHER FEEDBACK QUESTION INITIAL

Question	Initial
Lecturers offer constructive feedback and opportunities for improvement on student work, promoting student success.	TI 2a
Lecturers are approachable and willing to offer extra help or support to students in need.	TI 2b

Table 11. Teaching interaction latent validity test

Question	Correlation	R_{table}	Status
TI 1a	0.56	0.2542	Valid
TI 1b	0.53	0.2542	Valid
TI 1c	0.45	0.2542	Valid
TI 2a	0.82	0.2542	Valid
TI 2b	0.84	0.2542	Valid

We distributed the questionnaire and successfully obtained the predetermined number of responses, which constitutes our sample. Subsequently, the collected data underwent rigorous analysis using reliability and validity tests to assess the effectiveness and accuracy of our proposed measurement tool. The validity test for each question is already shown before (Table 1, Table 2, and Table 3). The table below shows the reliability score for each latent.

TABLE 12. ALPHA CRONBACH VALUE EACH LATENT

latent	Alpha cronbach	Conclusion
LMS	0.55	Moderate
Teaching Quality	0.50	Moderate
Teaching Interaction	0.54	Moderate

Upon reviewing the validity test, it is evident that all the questions hold validity. However, the reliability score of the latent variables indicates a moderate level of reliability. This suggests that the latents still exhibit acceptable performance as a measurement tool. Consequently, there is potential for improvement in the consistency coefficient of the latents [16].

VI. CONCLUSION

In summary, our measurement tool consisting of 15 questions has been validated for assessing student academic satisfaction through a reliability test. However, the latent variables within the tool demonstrate a moderate reliability score, as indicated by the Cronbach's alpha value. This suggests that there is potential for enhancing the consistency coefficient. Additionally, it is important to acknowledge that our tool's applicability beyond our university cannot be guaranteed solely based on the reliability score. To ensure its reliability and accuracy in measuring student academic satisfaction across different contexts, we recommend conducting further research with diverse samples or increasing the sample size.

REFERENCES

[1] F. B. Christina et al, "Satisfaction with the academic experience among graduate students of a brazilian public university," January 2018.

[2] R. M. Aline et al, "Satisfaction with academic experience among undergraduate nursing students", January 2015.

[3] L. Shuqiong, "Impact of academic experience and school climate of diversity on student satisfaction. Learning Environments Research", February 2018.

[4] D. H. Robyne and B. Cathy, "A Study of the First-Year Academic Experience at a Growing Liberal Arts Institution," July 2016.

[5] J H. K. Rawson and M. Frederico, "Student surveys: measuring the relationship between satisfaction and engagement," June 2021.

[6] Ella R. Kahu, "Framing student engagement in higher education", August 2011.

[7] K. David et al, "Student satisfaction surveys: the value in taking an historical perspective" July 2008.

[8] F. F. Ronald, "Can student surveys measure teaching quality ?," November 2012.

[9] N. Jonathan and B. Alexis, "Student Academic Experience Survey 2022," June 2022.

[10] Sandra Graham "Using Attribution Theory to Understand Social and Academic Motivation in African American Youth" June 2010.

[11] Ali Ramezani Ghotbabadi, Setareh Feiz, Dr. Rohaizat Baharun "Service Quality Measurements: A Review" February 2015.

[12] Kangas, M., Siklander, P., Randolph, J., & Ruokamo, H. (2017). Teachers' engagement and students' satisfaction with a playful learning environment. Teaching and Teacher Education, 63, 274–284. doi:10.1016/j.tate.2016.12.018.

[13] Ohliati, J. Measuring Students Satisfaction in Using Learning Management System.

[14] N. Jonathan and B. Alexis, "Student Academic Experience Survey 2022," June 2022.

[15] Mumtaz Ali Memon Et al, "SAMPLE SIZE FOR SURVEY RESEARCH: REVIEW AND RECOMMENDATIONS " June 2020.

[16] S. Tan "Misuses of KR-20 and Cronbach's Alpha Reliability Coefficients" 2009.

[17] N H S Simanullang and J Rajagukguk, "Learning Management System (LMS) Based On Moodle To Improve Students Learning Activity", 2020.

[18] Adeyinka, T., & Mutula, S. (2010). A proposed model for evaluating the success of WebCT course content management system. Computers in Human Behavior, 26(6), 1795–1805. doi:10.1016/j.chb.2010.07.007.

[19] Maican, C., Cazan, A.-M., Lixandroiu, R., & dovleac, L. (2018). A study on academic staff personality and technology acceptance: The case of communication and collaboration applications. Computers & Education. doi:10.1016/j.compedu.2018.09.010.

[20] Accessible Learning Management System (LMS) for Disabled People: Project Development Based on Accessibility Guidelines, Gamification, and Design Thinking Strategies.

[21] L. D. Hammond, "Defining teaching quality around the world", May 2021.

[22] Brophy, J. (1986). Classroom Management Techniques. Education and Urban Society, 18(2), 182–194. doi:10.1177/0013124586018002005.

[23] Rostker, L. E. (1945). The Measurement Of Teaching Ability Study Number One. The Journal of Experimental Education, 14(1), 6–51. doi:10.1080/00220973.1945.11010330.

[24] M. P. Manke, "Classroom Power Relations: Understanding Student-teacher Interaction", 1997.

[25] Groccia, J. E. (2018). What Is Student Engagement? New Directions for Teaching and Learning, 2018(154), 11–20. doi:10.1002/tl.20287.

[26] Skipper, Y., & Douglas, K. (2015). The influence of teacher feedback on children's perceptions of student-teacher relationships. British Journal of Educational Psychology, 85(3), 276–288. doi:10.1111/bjep.12070.