Academic Performance of Higher Education Students Through Online Learning

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Abstract **– The objective of this study is to investigate the relationship between academic success and personal development in students, as measured by their grades. The study aims to evaluate the effectiveness of policies in higher education institutions that promote both academic achievement and personal growth. The analytical method used is confirmatory factor analysis. The result of this study shows that students' personal development has no impact on the determination of online learning policies. Hence online learning policy determination cannot affect the assessment of online learning outcomes. Nonetheless, student's personal development undertaken can influence the assessment of online learning outcomes, and implementing online learning policies can mediate the effect of personal development on online learning outcomes assessment. Therefore, a student's future achievement should be determined only by the academic performance that does not have to depend on local government policy.**

Keywords **– Academic performance, higher education students, online learning.**

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1. Introduction

The COVID-19 pandemic started to spread in 2020. Due to the Covid-19 pandemic, Indonesian activity behavior has transformed from physical to virtual activities, including work, learning, and transaction [1]. Even though the Indonesian government has taken several proactive measures to encourage higher education distance learning, the Covid-19 pandemic continues to be a significant obstacle for higher education institutions in many developing countries, including Indonesia. The Covid-19 pandemic enabled higher education institutions to implement rapid digitalization for teaching and learning, despite the Indonesian government struggles to transform face-to-face learning into online learning.

The Covid-19 pandemic, according to Indonesian President Joko Widodo, is the ideal moment for the Indonesian government to accelerate its digital transformation. The first step in those directions is to build out and improve the country's digital infrastructure [2]. During the Covid-19 pandemic, many higher education institutions changed their learning method from face-to-face learning to online learning or distance learning using various online learning platforms. The online learning conducted during the pandemic expects to mitigate the loss of learning caused by educational disruptions during the Covid-19 pandemic.

Previous research shows that higher education students in Indonesia are satisfied with course materials, lecturers, and higher education regulations for implementing online learning during the Covid-19 pandemic [3]. In addition, previous research shows another factor that can influences higher education students' online learning satisfaction, namely online learning self-efficacy [4]. Therefore, student satisfaction with online lectures should be able to increase academic performance.

Several previous studies have examined the impact of online lectures in higher education institutions on student academic performance. For example, research on online learning and student performance during the Covid-19 pandemic in schools in China shows that online learning resources benefit students and reduce inequality in exam performance because students with worse exam results benefit more from online learning [5]. In addition, the research also found that the quality of the students who design and deliver recorded online lessons significantly affects students' examination results [5]. Finally, the study advises higher education institutions to consider using similar support mechanisms in the event of a disaster that might occur in the future [6]. However, this mechanism must also highlight the need for careful consideration of the assessment design and examination conditions to optimize the integrity and authenticity of the assessment.

Online lectures held during the Covid-19 pandemic can have a good or bad impact on the academic performance of students in various higher education institutions, both in Indonesia and other countries. This research focuses on higher education institutions in Indonesia and aims to answer whether online learning positively affect the academic performance of higher education students.

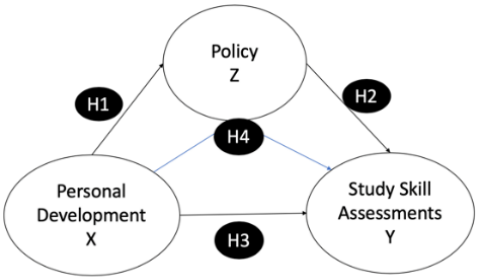

Figure 1. Research hypotheses

Figure 1 above shows the study's variables to test. The study has four hypotheses as follows.

H1: Personal development significantly influences online learning policies.

H2: Setting online learning policies significantly influences the assessment of online learning outcomes.

H3: Personal development significantly influences the assessment of online learning outcomes.

H4: Setting online learning policies can mediate the effect of personal development on the assessment of online learning outcomes.

2. Methodology

The population of the research consisted of students attending Indonesian public and private higher education institutions during the academic year 2020 to 2021.

The sampling of research in the academic year is related to the issuance of a decision by the Ministry of Education and Culture of the Republic of Indonesia regarding the first online learning to be implemented in Indonesia on March 2, 2020 [7], [8]. The study's sample are students enrolled in both public and private higher education institutions in the five largest islands in Indonesia, namely Sumatra, Java, Kalimantan, Sulawesi, Bali and Nusa Tenggara, and Papua. In addition, some big cities involved include Jakarta, Yogyakarta, Palembang, Padang, Medan, Aceh, Lampung, Semarang, Surabaya, and others.

Researchers distributed questionnaires containing only closed-ended questions to analyze the higher education student's academic performance in online learning during the Covid-19 pandemic. The researchers distributed the questionnaire using Google Forms to students actively attending lectures during the academic year 2020 to 2021 in those five larger islands in Indonesia mentioned earlier in this section. In collecting the data, a questionnaire has five sections: demography, online learning experience, student assessment of online lectures, student health conditions during online lectures, and personal development before and during the Covid-19 pandemic. In analyzing the answers from the respondents, the researchers used the forced Likert scale for several survey questions, ranging from strongly agreeing (4 points), agreeing (3 points), disagreeing (2 points), and strongly disagreeing (1 point). The researchers used a 4-point scale to avoid students choosing unclear answers [9]. The data were analyzed descriptively and quantitatively. The data analyzed quantitatively will be described and explained as conclusions drawn from the events observed based on the numbers [10], [11]. Quantitative analysis was employed to examine the relationship between the variables obtained in this survey. The data were analyzed using path analysis with intervening variables, followed by the Sobel test to validate the previously stated research hypothesis [12], [13].

3. Results

The results section of this paper has five sub-sections. The first sub-section is the demography section, which includes age, gender, school funding information, and school types (public or private). The second sub-section is an online learning experience that describes the different types of applications used and the duration of online learning. The third sub-section is the online learning assessment which describes online learning course material and flexibility.

The fourth sub-section is a student health condition, which describes the student's health condition and experience during online learning. In addition, this sub-section also describes how lecturers tolerate students who are sick while participating in online learning during the Covid-19 pandemic. The fifth sub-section describes student personal development, including some activities students participate in for self-development, such as webinars [34].

Demography

Respondents in this study were active semester students for the 2020 to 2021 academic year from the second semester to the twelfth semester 2,423 with a distribution of 30.8% in the second semester, 29.3% in the fourth semester, 21.7% in the sixth semester, 16.2% in semester eight, 1.8% in semester ten, and 0.2% in semester 12.

Table 1. Respondent demographics

Age	Male	Female
< 18 year old	52	138
> 36 year old	31	37
19 - 24 year old	605	1413
25 - 30 year old	47	37
31 - 36 year old	29	34

Table 1 shows the demographics of the respondents in this study, which showed that female respondents dominated with a percentage of 68.5% and males by 31.5%. With the age distribution of male respondents, namely 6.8% aged less than 18 years, 79.2% aged 19-24 years, 6.2% 25-30 years, 3.8% 31-35 years, 4.1% aged more than 36 years, while the age distribution of female respondents was 8.3% aged less than 18 years, 85.2% aged 19-24 years, 2.2% aged 25-30 years, 2.0% aged 31-35 years, and 2.2% are over 36 years old. If considered based on educational level, the data distribution of students at each level, namely 5.8% diploma, 87.4% undergraduate, 5.1% masters, and 1.7% doctoral.

Table 2. School funding

Tuition Funding	Public College	Private College
Scholarship	133	274
Parent-fund	419	1,316
Self-fund	66	215

Table 2 shows the tuition fees of the respondents of this research survey. Respondents to this research survey came from 148 different tertiary institutions, both public and private universities. When viewed by the higher education category, as many as 618 respondents came from state universities, and 1,805 came from private universities. Regarding lecture payment, 16.8% received scholarships, parents paid for 71.6%, and 11.6% paid by themselves.

As for this study, the respondents came from various departments, which were quite varied such as public administration, Islamic religious studies, agribusiness, agrotechnology, accounting, science, law, medicine, nursing, government, information technology, social and culture, and many others.

Online Learning Experience

During the Covid-19 pandemic, higher education institutions in Indonesia have carried out online learning, requiring students and lecturers to carry out face-to-face learning, thereby limiting interaction by both parties. The online learning in question is carried out remotely, unlike traditional learning in general [14]. There have been many applications capable of supporting online learning, one of which is the learning management system (LMS) provided by every tertiary institution [15], [16]. In this research survey, the percentage of applications used to support online learning with the highest to the lowest percentage was 49.5% Zoom Cloud Meeting, 19.7% Higher Education e-Learning, 17.2% Google Meet, 13.3% Google Classroom, and 0.2% Webex. The most choices for implementing learning are Zoom Cloud Meeting, Google Meet, and Google Classroom. The study survey result aligns with Assidiqi and Sumarni's research) , which shows that Zoom Cloud Meetings and Google applications such as Google Classroom and Google Meet are still the top choices for universities in implementing online learning [17].

Table 3. Application and duration of online learning

Duration	LMS	Google Classroom	Google Meet	Webex	Zoom
< 30 minutes	19	48	14	0	62
30 - 59 minutes	203	186	154	2	471
60 - 89 minutes	110	52	98	2	289
90 - 120 minutes	103	27	112	1	249
120 - 150 minutes	31	5	22	1	85
> 150 minutes	12	5	16	0	44

There are six categories of respondents' time implementing online learning: less than 30 minutes, 30-59 minutes, 60-89 minutes, 90-120 minutes, and 120-150 minutes. In this study, the distribution of time for implementing online learning was: 5.9% for less than 30 minutes, 41.9% for 30-59%, 22.7% for 60-89 minutes, 20.3% for 90-120 minutes, 3.2% for 90-120 minutes, and 5.9% for more than 150 minutes. The highest percentage of time range of online learning is 30-59 minutes, followed by 60-89 minutes and 90-120 minutes. Network difficulties are one reason instructors conduct a short online learning time [18], [19].

To overcome obstacles in the learning process caused by unstable internet networks in the implementation of lectures, many educators choose learning with different learning methods, namely providing recorded learning videos and giving assignments [20].

Online Learning Assessment

Assessment in online learning carried out by educators is slightly different from direct learning. Therefore, the instructors should adjust the online learning assessment according to the learning implementation plan designed at the beginning of learning. The survey in this study showed that 30.4% of students stated that they strongly agreed, 67.9% agreed, and 1.7% disagreed regarding the suitability of learning with the lesson plan designed by the lecturer. This percentage shows that lecturers conducting online learning have followed the lesson plans designed at the beginning of class, but some students state that there is learning that differs from the lesson plans. It might happen because of some of the difficulties experienced by lecturers in online learning, such as internet networks [21], [22]. This difficulty causes lecturers to adapt learning to the various obstacles experienced during the Covid-19 pandemic.

Other forms of assessment usually given by lecturers during lectures include quizzes, assignments, midterm exams, and final exams. The assessment given to students should get an evaluation and explanation so that it can be an improvement for students. In the survey regarding lecturers who provided explanations related to the evaluation results, it shows that there were 23.7% who strongly agreed that there were lecturers who provided explanations regarding the evaluation results, 66.0% agreed, 9.9% disagreed, and 0.4% strongly disagreed that lecturers who explained the results of the evaluation. It is in line with the survey results regarding the announcement of the results of the evaluation carried out, with a distribution of 27.4% strongly agreeing that there are lecturers who announce evaluation results, 65.2% agree that there are lecturers who announce evaluation results, 7.1% disagree that there is the lecturer who announced the evaluation results, and 0.4% strongly disagreed that the lecturer announced the evaluation results. It is due to the convenience of e-learning, such as Google Classroom and other LMS, correcting and sharing student assessment results [23]. Based on student answers to the survey, the lecturers at the tertiary institution occupied are ready to conduct online lectures.

The scores obtained by students during online learning based on surveys show that students tend to get grades with an A predicate.

The survey shows that 56.5% and 17.4% of students agree and strongly agree that while attending online lectures, they tend to get an A in the courses taken easily compared to face-to-face lectures before the Covid-19 pandemic. On the other hand, 606 students or 25.0% and 27 students or 1.1% felt they disagreed that it is easier for them to get A+/A/A- in the courses taken compared to attending face-to-face lectures before the Covid-19 pandemic. They strongly disagreed that while attending online lectures, they tended to easily get an A in the courses taken compared to attending face-to-face lectures before the Covid-19 pandemic.

In this research survey, most students disagreed that it is vulnerable to getting a C while attending online lectures. The survey results show a distribution of 8.5% strongly agree, 27.9% agree, 53.8% disagree, and 9.9% strongly disagree. Most students think that it is easier to achieve an A predicate. It shows that students experience increased learning outcomes during online learning. Student responses supported by students resulted in an increase in grade point average compared to the previous semester's in-person sessions.

Student Health Condition

During the Covid-19 pandemic, many people, including students, have been affected by this disease. Based on the results of this research survey, there were 382 students affected by Covid-19. Apart from Covid-19 disease, students are also inseparable from various other diseases experienced during the Covid-19 pandemic, which can impact the learning process. Based on the results of the survey shows that 1,187 students had experienced symptoms of being unwell while undergoing this online lecture.

The response given by the lecturer regarding students who experienced ill conditions and suffered from Covid-19 included the additional and flexible time in completing assignments. The survey results show that 155 students or 13.1% and 734 students or 61.8% are strongly agreed and agreed that the instructor had given them leeway in completing assignments. However, a few students believed they did not receive additional and flexible time to finish their projects while exposed to Covid-19, with 279 students or 23.5% disagreeing and 19 students or 1.6% significantly disagreeing. In addition, some lecturers provide convenience in giving grades. The survey answers showed that 9.9% strongly agreed, 49.4% agreed, 38.5% disagreed, and 2.3% strongly disagreed. Based on this percentage, more students believe that online lectures provide the convenience of obtaining good grades.

Student Personal Development

Students have made various efforts to develop themselves during the Covid-19 pandemic, one of which is by participating in webinars. As a result, it has increased the number of webinar participants during the Covid-19 pandemic [24]. Similarly, 79.1% of the total 2,423 respondents reported participating in webinars during the Covid-19 epidemic, as indicated by the results of this study survey.

Table 4. Number of webinar participation

Number of Webinar Participation	Number of Respondents
< 5 webinar	1,130
5 - 10 webinar	573
11 -15 webinar	110
16 -20 webinar	42
> 20 webinar	58
N/A (not applicable)	4

Table 4 above shows the number of webinars attended by students. It shows that the highest percentage was in 1 to 10 webinars attended by students during the Covid-19 pandemic. On the other hand, four students have never attended a webinar during this pandemic. The various considerations of students participating in the webinar are described in Table 5 below.

Table 5. Factors participating in webinar

Factor	Response	Associated with course/ major at school	Develop soft skill or hard skill
Fee	Strongly agree	19	25
	Agree	49	56
	Disagree	12	1
	Strongly Disagree	3	1
Webinar Duration	Strongly agree	10	65
	Agree	31	129
	Disagree	5	2
	Strongly Disagree	0	0
Speaker Credibility	Strongly agree	63	65
	Agree	111	129
	Disagree	22	2
	Strongly Disagree	0	0
Organizer Credibility	Strongly agree	51	60
	Agree	62	57
	Disagree	6	2
	Strongly Disagree	1	1
Mandatory Couse Requirement	Strongly agree	78	64
	Agree	212	225
	Disagree	14	16
	Strongly Disagree	1	0
Webinar Topic	Strongly agree	246	331
	Agree	725	726
	Disagree	100	14
	Strongly Disagree	1	1
Time	Strongly agree	18	19
	Agree	66	72
	Disagree	11	4
	Strongly Disagree	0	0

Table 5 above shows that the primary consideration in participating in a webinar is webinar topics, followed by the mandatory requirements of a course. The respondents confirmed that the factor influencing them to participate in the webinar by the responses of subsequent responders to the line "The webinar attended corresponds to the course major," for which 1,256 students responded yes. So, again, the topic is relevant to the course and is a requirement. In addition, by participating in the webinar, respondents felt they could improve their abilities. Again, the respondents' answers show that "By participating in the webinar, you can improve your abilities," with 97.5% in agree and strongly agreeing on categories.

4. Analysis and Discussion

The analysis and design section of this paper has five sub-sections. The first sub-section describes the validity and reliability test conducted in this study to validate and measure the research instrument's consistency. The second sub-section describes the model feasibility using path analysis. The third sub-section describes testing instrumental supporting intervening variables with Sobel test.

Validity dan Reliability

In this study, the researcher conducted a validity and reliability test to see whether the researchers could use the instrument for conducting the research. The researchers tested this instrument's validity using the Pearson product-moment correlation formula. Before disseminating the survey, the researchers started to test the questionnaire to 50 respondents with a two-way significance degree of freedom level (α=0.05). Based on the number of respondents and significance level, the r table is 0.2353.

Table 6. Validity test

Variable	Code	Attribute	r count	r table	Validity
Online Learning	Q.1.1	Connection and Learning Process	0,555	0,235	Valid
Assessment	Q.2.1	Learning Material	0,518	0,235	Valid
	Q.2.2	Evaluation Assessment Result	0,658	0,235	Valid
	Q.2.3	Learning Readiness	0,783	0,235	Valid
	Q.2.4	Learning Process	0,602	0,235	Valid
	Q.2.5	Evaluation Assessment Result	0,795	0,235	Valid
Health	Q.3.1	Learning Material	0,745	0,235	Valid
	Q.3.2	Evaluation Assessment Result	0,631	0,235	Valid
	Q.3.3	Evaluation Assessment Result	0,332	0,235	Valid
	Q.3.4	Learning Process	0,725	0,235	Valid
	Q.3.5	Learning Process	0,675	0,235	Valid
Workshop	Q.4.1	Evaluation Assessment Result	0,591	0,235	Valid
	Q.4.2	Connection and Learning Process	0,669	0,235	Valid
	Q.4.3	Learning Readiness	0,637	0,235	Valid

Source: Primary data (processed), 2023

Table 6 above shows the results of the validity of each research survey category, namely: Online Learning, Assessment, Health, and Workshop Training. It shows that the value of each r count is more than the r table, so the researchers can conclude that each instrument is valid for use in this study.

In testing the reliability, the study uses the Guilford coefficient category, namely if $0.8 < r\_11 \leq 1.00$, then the research instrument is said to have very high reliability; if and more than $0.6 < r\_11 \leq 0.8$, then the instrument is said to have high reliability, $0.4 < r\_11 \leq 0.6$ then the instrument is said to have moderate reliability, if $0.2<r\_11\leq0.4$ then the instrument has low reliability, and if $0.00\leq r\_11\leq0.2$ then the instrument is said to have very low reliability.

This study conducted the reliability test and obtained the value of r_11 was 0.8713052681. These results indicate that the instrument used is highly reliable and included in the $0.8<r\_11\leq1.00$ category. Furthermore, the reliability test results show that the research instrument is reliable and ready to use. Therefore, the survey was permitted to be delivered to respondents since the research instrument is genuine and trustworthy.

Model Feasibility Test

Table 7 below explains how a model can be said to be a good fit based on absolute fit measures [25], [26],[27]. In this case, we examine an online learning outcome assessment model influenced by personal development and establishing online learning policies. The higher education institution can adopt this model to see evaluations and make future decisions regarding online learning. Table 7 shows the conclusion of all measures fulfilled in the form of good fit based on the absolute fit size. It further confirms that the research model is acceptable.

Table 7. Goodness of fit test

Measurement	Score	Matching Target	Details	Measurement
Chi Square	0.444	The score is below 2	Good Fit	Absolute match
P Value	0.000	The score is below 2	Good Fit	
NCP	1.906	The score is below 2	Good Fit	
RMSEA	0.092	The score is below 2	Good Fit	
Model conclusion: good fit				

Source: Primary data (processed), 2023

Testing Instrumental Supporting Variable

Table 8 above shows the indicators supporting the research variables, whether they meet the criteria or not, the size of the probability value generated must be below 0.05, and the estimated value generated must be above 1.97 [25], [26], [27]. It emphasizes that all indicators meet the criteria.

Table 8. Research indicator estimating test

Indicator	Estimate	Standard Estimate	p	Standard p	Details
X1.1	3.123	> 1,96	0.000	<0.05	Satisfy
X1.2	3.208	> 1,96	0.000	<0.05	Satisfy
X1.3	2.726	> 1,96	0.000	<0.05	Satisfy
X1.4	2.783	> 1,96	0.000	<0.05	Satisfy
Z1.1	2.864	> 1,96	0.000	<0.05	Satisfy
Z1.2	2.668	> 1,96	0.000	<0.05	Satisfy
Z1.3	3.000	> 1,96	0.000	<0.05	Satisfy
Z1.4	3.052	> 1,96	0.000	<0.05	Satisfy
Z1.5	2.914	> 1,96	0.000	<0.05	Satisfy
Y1.1	3.288	> 1,96	0.000	<0.05	Satisfy
Y1.1	3.195	> 1,96	0.000	<0.05	Satisfy
Y1.1	3.130	> 1,96	0.000	<0.05	Satisfy
Y1.1	3.174	> 1,96	0.000	<0.05	Satisfy
Y1.1	3.135	> 1,96	0.000	<0.05	Satisfy
Y1.1	3.115	> 1,96	0.000	<0.05	Satisfy

Source: Primary data (processed), 2023

In Table 9 below, the personal development indicators are X1.1, X1.2, X1.3, and X1.4. Student personal development is the process of increasing abilities, skills, and self-awareness to enhance personal quality in the future. In this context, personal development includes various essential characteristics, such as knowledge, skills, attitudes, abilities (hard and soft), capabilities in information technology and information systems, and updates on technological advancements. Moreover, an excellent personal development program can assist students in recognizing their desires and potential for success in an increasingly competitive global economy.

Acquiring new knowledge, particularly in information technology and information systems, is a critical aspect of student development. In addition to having a comprehensive and in-depth understanding of the academic topic studied, students must also have foreign language skills and acquire knowledge about the international world, such as international research, international cooperation, and how to adapt to an international work environment. In addition to studying and conducting research on campus, students must participate in training, seminars, and student organizations to obtain knowledge and experience.

Developing hard skills and soft abilities is essential for student competence. In fact, student academic competence is a secondary consideration. Excellent students are not only competent in the subject of education but also should possess practical abilities such as interpersonal skills, time management, teamwork, problem-solving, and others. It is where the value of training and workshops can assist students in developing the skills necessary for the future workplace. Students must also have an optimistic perspective on all aspects of life.

Students must develop a risk-taking attitude characterized by passion, self-assurance, discipline, creative and original thought. This mentality can make it easier for students to face future difficulties and obstacles. Thus, students must be taught with personal development attitudes to promote their success in different disciplines.

Table 9. Research indicator: personal development, policy, and online learning result assessment

Indicator	Description	Details
X1.1	Your participation in the webinar is related to the course you are currently enrolled in.	Satisfy
X1.2	Your participation in the webinar helped to develop your soft skill and/or hard skill.	Satisfy
X1.3	You did not face difficulty in internet connection while participating in the webinar.	Satisfy
X1.4	You did not face difficulty in supporting devices (hardware and software) while participating in the webinar.	Satisfy
Z1.1	While experiencing symptoms of illness, your instructor typically provides you more time to complete assignments, quizzes, and exams.	Satisfy
Z1.2	As long as you continue to have symptoms of illness, your instructor is likely to give you easier grades in course taken.	Satisfy
Z1.3	Your instructor provides schedule flexibility for completing coursework, quizzes, and tests throughout Covid-19 exposure.	Satisfy
Z1.4	The time allocation for completing assignments, quizzes, and exams is considered sufficient.	Satisfy
Z1.5	While suffering from Covid-19, your instructor tends to make it easy to give grades to course taken.	Satisfy
Y1.1	The course material is consistent with the lesson plan described at the beginning of the class.	Satisfy
Y1.1	Your instructor gives and publishes the findings of his evaluations (quizzes, assignments, midterm exam, and final exam).	Satisfy
Y1.1	Your professor explains the results of the evaluation he has conducted (quizzes, assignments, midterm exam, and final exam).	Satisfy
Y1.1	Your institution's instructors are prepared to deliver online lectures.	Satisfy
Y1.1	While attending online lectures, your instructor allows time flexibility for completing quizzes, assignments, midterm exam, and final exam (during the Covid-19 pandemic).	Satisfy
Y1.1	Your instructor provides numerous grading conveniences when you attend online lectures (during the Covid-19 pandemic).	Satisfy

Source: Primary data, 2023

In Table 9 above, the policy indicators are Z1.1, Z1.2, Z1.3, Z1.4, dan Z1.5. In response to the global COVID-19 pandemic, universities have implemented online learning as an alternative to traditional classroom instruction. Through online learning, students can access online course materials and educational resources. This new educational paradigm has presented administrators, instructors, and students with significant difficulties and opportunities. Implementing this new system necessitates several essential components of an online education policy.

First, providing equal access to educational resources is a policy needed for online learning. It is imperative that all students, regardless of socioeconomic status, have access to high-speed internet, suitable equipment, and online learning platforms. To do this, governments and educational institutions may need to invest in the technological infrastructure of remote or underprivileged communities.

Second, providing the alternative for low-income students to acquire essential technology is through grants and scholarships. The policies governing online education must stress the roles and responsibilities of instructors in delivering quality online education. To teach and evaluate students in a virtual environment, lecturers must complete a training course. They must also learn to utilize each student that requires further support. Higher education institutions should regulate the policy that also focuses on the software and equipment used by instructors while delivering online learning to have efficient online learning. For example, the instructors should use supported webcams, microphones for video conferencing, and online whiteboards for conducting interactive instruction during online learning.

Third, creating a planned learning program is crucial for guaranteeing the successful deployment of online learning. Students should have access to a thorough explanation of the course's objectives, assignments, assessments, and grading systems. Also, students must clearly understand the expectations of their course. The policy should also specify how students can receive support and communicate with students and peers in virtual classrooms. In addition, the policy must ensure that each student has the same opportunity to participate fully in group discussions and assignments.

Fourth, the policy must secure all students' and instructors' data privacy and cyber security. Online education necessitates sharing and storing sensitive data, which must protect against data breaches and cyberattacks. Internet data repositories should be protected, secured, and often backed up.

In order to prevent the inadvertent leaking of sensitive information, students and instructors should receive training on cybersecurity risks.

In conclusion, to ensure that all students have equal access to a high-quality education, online learning policies should focus on developing instructors' training programs, providing explicit course content, providing reliable technology, encouraging active student participation, and ensuring data privacy and cyber security. While there is no disputing the difficulties associated with online learning, this policy will ensure that e-learning is a viable option for students to achieve their educational objectives.

In Table 9 previously presented , the assessment of learning outcomes indicators are Y1.1, Y1.2, Y1.3, Y1.4, Y1,5, and Y1.5. In the digital era, online learning platforms have become integral to the academic curriculum. Online learning has revolutionized traditional learning methods and has paved the way for online learning. With convenience and flexibility, online learning has become popular among students. However, assessing learning outcomes from online education poses significant challenges.

Online learning offers a promising approach to enhancing and streamlining traditional classroom learning formats. Online learning systems offer various benefits, such as time flexibility, provision of various multimedia components, and personalized learning experiences. However, with a large student population, measuring the effectiveness of online learning can be overwhelming. In online learning, the evaluation of student learning outcomes is not limited to memorized facts but also an assessment of their ability to apply the newly learned knowledge.

To assess student learning outcomes online, various assessment tools are available. They include quizzes, assignments, tests, and projects to measure students' knowledge of the course learning. This assessment method helps evaluate quickly memorized facts and concepts taught during online learning classes. Assignments, however, explain how students apply their knowledge to real-life scenarios. In addition, instructors can use research projects and assignments to measure students' critical thinking, problem-solving, and research skills.

In addition, the instructors can use peer evaluation and self-assessment to evaluate student learning outcomes online. Peer evaluation holds students accountable while promoting peer collaboration. It allows students to assess each other's work and approach a given assignment or project. Self-assessment used to encourage students to reflect on their learning progress, identify gaps in their knowledge, and determine their strengths.

In conclusion, assessing online learning outcomes is critical to evaluate the effectiveness of e-learning formats. Therefore, combining various assessment methods to measure student learning outcomes is very important. Traditional assessment methods, such as quizzes, assignments, tests, and projects, have an essential role to play in online learning education. In addition, peer evaluation and self-assessment are also important ways to promote peer collaboration and encourage students to take responsibility for their learning progress. As a result, to evaluate efficiently, instructors can use various methods to help continuously improve the online learning system.

Table 10. Correlation value among personal development, policy, and online learning result assessment

Relation	Estimate	SE	CR	P	Details
Personal development influences online learning policy determination (H1)	0.085	0.069	1.222	0.222	No impact
Online learning policy determination influences online learning outcomes assessment (H2)	0.012	0.029	0.405	0.686	No impact
Personal development influences online learning outcomes assessment (H3)	0.321	0.044	7.239	0.000	Give an impact

Source: Primary data (processed), 2023

Table 10 above explains the proof of the three hypotheses of this study, namely H1, H2, and H3. The results of this study indicate that H1 and H2 are rejected. This is because H1: personal development does not influence online learning policy determination, and H2: Online learning policy determination does not influence online learning outcome assessment. On the other hand, H3 is acceptable because personal development influences online learning outcome assessment.

Figure 2 below shows a research model with three research variables: X for personal development, Y for study skill assessments, and Z for policy.

The research model above shows that variable Z could not influence variable Y. On the other hand, variable X could influence the variable Y. The research model above describes a model that can be used in the guideline for assessing learning outcomes based on the extent to which personal development efforts have been carried out involving the role of policy giving.

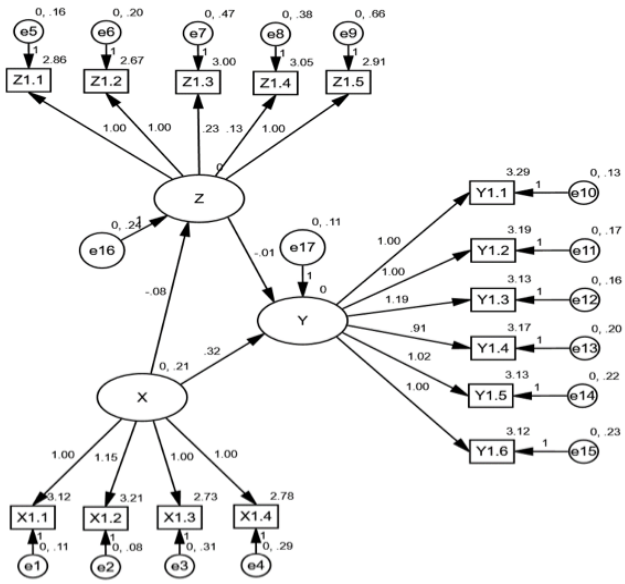

Figure 2. Research model

Figure 3 below illustrates the proof of the fourth hypothesis, showing that the fourth hypothesis can be accepted. It is because establishing online learning policies can mediate the effect of personal development on assessing online learning outcomes.

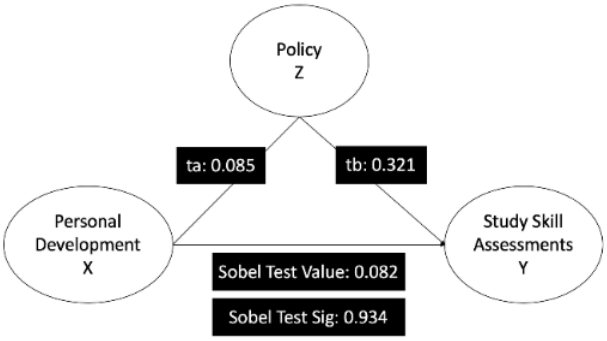

Figure 3. Research mediation model

This study found that the personal development variable could not affect the online learning policy determination variable, which meant that the first hypothesis was rejected. Normatively, the personal development of students will indeed depend on applicable rules, as there are norms that must be committed to but that only apply to physical learning [27], [28], [29]. When implemented into other types of learning, it becomes subjective.

It proves that when it is applied to forms of online learning, personal development will not affect how policy determination is enforced because personal development will be different if the type of learning is different [30], [31], [32]. For example, students who carry out forms of personal development using an online approach (online training, webinars, and online conferences) certainly pay more attention to infrastructure factors such as networks, not a regulatory issue; instead, regulations must adapt to how forms of learning continue to transform.

This study also found that the online learning policy setting variable could not influence the online learning outcome assessment variable, indicating that the second hypothesis was rejected. Typically, rules and policies affect how the assessment results are applied in activities, exams, and other evaluation forms. It shows from several events, such as assessment, graduation, and other criteria where all of these are compiled first, the policy is formed, and then implemented [35]. However, in this study, the opposite happened; this development is natural because existing learning patterns are changing, and the marginal changes are sudden, meaning that not every element in education is prepared to follow the marginal changes, specifically the transition from face-to-face to online learning. Then all policy support instruments will undoubtedly be different from the existing reality. Higher Education Institutions can only measure students' success rates in online learning if they set the proper rules for online learning [36]. Therefore, regulations in organizing online lectures are one of the essential things that must be explicitly considered as a core instrument in the online learning assessment pattern [37], [38], [39]..

This study also found that personal development variables can affect the assessment of online learning outcomes, indicating that the third hypothesis is accepted. Personal development by students will undoubtedly improve their quality. It impacts the good grades they get. Personal development must adapt to existing conditions, so it cannot be conducted assuming normal conditions, so personal development is carried out normally, so adjustment is an important factor [40], [41], [42], [33]. Personal development can be done to get good grades in online learning, such as attending online training whose variations and distribution cannot be limited. For example, students can study in small towns in developing countries, but conversely, students can get knowledge from big cities in developed countries. It is critical to realize that online learning no longer depends on learning objects like online learning infrastructure. However, greater importance should be placed on learning subjects.

The learning subjects include the development of human resources that will utilize this online learning infrastructure for online teaching and online learning ethics [43], [44], [45].

In this study, researchers found that setting online learning policies can mediate the effect of personal development on assessing online learning outcomes. It shows that setting online learning policies can mediate the effect of personal development on assessing online learning outcomes, which means that the fourth hypothesis is accepted. Although in the previous hypothesis testing, the relationship between establishing online learning policies on online learning outcomes assessment has no effect (H2), the establishment of online learning policies on online learning outcomes assessment has no effect. This emphasizes the importance of a comprehensive policy in regulating how online learning patterns can meet all cognitive and affective elements. However, it is inversely proportional if this variable is used as an intermediate variable. The result is that establishing online learning policies can mediate the influence of personal development on online learning outcomes assessment. It cannot be denied that policy plays a role in education, especially in developing countries. In developing countries, rules, regulation, and policy often have two effects, good and partial, or vice versa, which cannot be impartial due to following political conditions and collusive practices. However, the discovery of this mediation model is a proof that the government has a vital role in the world of education, especially in online learning patterns [46], [47], [48].

These findings can be used as a reference in making decisions on determining the right online learning pattern, especially in developing countries. However, policies do not only originate from the norms of the applicable law but also pay attention to social norms because this is different from how personal development patterns are in developed and developing countries [49], [50], [51].

5. Conclusion

Personal development is an interesting thing to study, let alone the drastic changes in learning patterns from face-to-face to online. In addition, learning is now more towards hybrid learning, which gives students and instructors the flexibility to combine online and face-to-face lectures in the learning process. In this study, the researchers examined a model for evaluating online learning outcomes influenced by personal development and setting online learning policies. The higher education institutions can adopt this model to see evaluations and make future online learning decisions.

However, it becomes subjective when implemented into other forms of learning. It has been demonstrated that personal development will not impact policy enforcement when applied to online learning forms, as personal development will vary depending on the type of learning.

The same thing is that rules and policies will typically affect how the assessment results are applied in the form of activity, both exams and other forms of evaluation. Again, it can be seen from several occurrences, such as assessment criteria, graduation criteria, and other forms of criteria, all of which were compiled first, formed for approval, or could be in the form of a new policy that was implemented.

Personal development by students will undoubtedly improve their quality. It impacts the good grades they get. In this case, personal development must adapt to existing conditions; personal development cannot be conducted under normal conditions; therefore, adjustment is essential. This study concludes that personal development carried out by students cannot affect the determination of online learning policies, and the determination of online learning policies cannot affect the assessment of online learning outcomes. However, on the other hand, the results of this study show that personal development carried out by students can influence the assessment of online learning outcomes, and the establishment of online learning policies can mediate the effect of personal development on the assessment of online learning outcomes.

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