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The Role of Locus of Control and Resilience in Student Academic Achievement

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Abstract. This study aims to investigate the role of locus of control, resilience, gender, talent, on student academic achievement and the relationship between these variables. There were 550 students participated in the study who were grouped based on the focus locus of control both internally and externally. The research method used was factorial design analysis with the aim of investigating the correlation between locus of control variables, resilience, gender, IQ, and student academic achievement. Researchers used ANOVA to investigate the relationship between these variables. The results showed that the internal locus students had superior academic resilience and achievement than the external locus students. Students who focus on internal aspects (internal locus of control) are more resilient and better at overcoming difficulties. The female gender tends to have better resilience compared to males and intelligence or IQ greatly contributes to student resilience. In addition, student resilience also affects the ability to solve student academic challenges. The implication of this research is that teachers must develop resilience and internal focus during the learning process in order to obtain better academic achievement.

Keywords: locus control; resilience; academic achievement; talent

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1. Introduction

Currently, learning is directed at the main goal of facilitating students to master a particular subject matter, regardless of student internal factors that can hinder or help them. Many students have good potential, but cannot emerge optimally (Bell et al., 2020; Hart et al., 2021). It needs to be understood that the role of the teacher is not only to lead students to achieve good academic achievement, but also to be able to optimise the potential of these students so that their abilities are not hampered. There are several factors that affect the academic achievement of these students. Some experts mention that among the aspects that play a very important role are internal and external locus of control, and student resilience (Jore, 2020; Mętel et al., 2022). However, there is still little research that reveals internal aspects that can encourage optimal student learning. Through research, teachers are expected to be able to understand how to optimise student learning and academic achievement so that they have high academic abilities with a quality learning environment. This research supports the needs of stakeholders and teachers in order to optimise students' academic abilities. Departing from the low academic ability of students in Indonesia, one of the proofs is the low PISA (Programme for International Student Assessment) ranking of students; researchers believe there are internal problems that must be corrected by the teacher (Hadianto et al., 2022; Spilg et al., 2022). Many breakthrough methods, models, learning techniques are carried out by teachers but are not optimal in helping students achieve academic achievement. In addition to the PISA ranking, the low academic abilities of Indonesian students are reinforced by PIRLS (Progress in International Reading Literacy Study) and TIMMS (Trends in International Mathematics and Science Study) data which show literacy skills and math skills are still low. One of the reasons why students' academic abilities in Indonesia are still not optimal is the not optimal role of the teacher in optimising the role of locus of control of students. Based on the previous year's academic achievements, the academic achievements of students in Indonesia have decreased, especially in reading and math literacy skills (Schmid & Haukedal, 2022; Smith-Adcock et al., 2019). Therefore, further analysis is needed regarding the internal factors that exist in students and which can affect the academic achievement of high school level students.

For academic development, previous research has proven that students who receive full-time learning are superior academically compared to part-time students (Finklestein et al., 2022; Hadianto et al., 2021a). During the learning process, the ability of students to overcome pressure and difficulties during the learning process is not only very influential on psychology and health, but they are also able to achieve higher academic achievement compared to students who are unable to cope with pressure. Student resilience can be trained by providing individual targets or goals because, through this individual assignment, students are encouraged to overcome difficulties, pressure, and doubts (Çelik et al., 2015; Finklestein et al., 2022). In addition, through assignments in class students experience competition and ability comparisons with their friends. This process can help students to improve their academic abilities. The pressure experienced becomes an open opportunity for students to develop into more qualified students. The psychological development of these students is very dependent on their beliefs whether they are able to complete the challenge of the

task or not (Hart et al., 2021; Mętel et al., 2022). In general, students who excel academically have more motivation to complete assignments and are more involved in the learning process.

However, apart from the motivation of students who are academically superior and those who are not, it is necessary to investigate further what makes these students who excel academically have more motivation in learning. Through this study, researchers attempted to investigate student locus of control and resilience and their relationship with student academic achievement. Previous research has found that there is a relationship between internal control, resilience, and academic achievement (Aliyev et al., 2021; Bester & Kuyper, 2020). In addition, other studies investigating the potential of students with low economic ability found that factors that support academic resilience are positive perceptions of their academic abilities, views on higher education, internal control, and students' expectations about their future. Other studies have found that one of the internal controls is student personality, which can be a predictor of student academic achievement (Bevilacqua et al., 2020; Huang et al., 2021). This research is different from previous research as it focuses on investigating the role of locus of control, resilience, gender, and talent in student academic achievement and the relationship between these variables. This research has implications for the role of the teacher in facilitating high and low achieving students to be able to achieve optimal academic achievement for both.

2. Literature Review

2.1 Cognitive and motivational contribution to academic achievement

Aspects that have almost the same contribution to the development of students' academic abilities are motivation and cognitive (Lanz, 2020; Yeung & Li, 2021). This theory is also strengthened by research that shows the results of assignments and motivation that have a positive relationship with student academic achievement are intrinsic motivation, self-capacity, and locus of control (Huang et al., 2022; Trigueros et al., 2022). In addition, another finding is that aspects of motivation and resilience contribute significantly to student academic achievement.

2.2 Motivation

Internal and external control of students is strongly influenced by motivation. Forms of motivation that can influence internal control are attention, effort, strong will, and persistence. These motivations provide positive energy so that they are able to direct and maintain students' positive actions which ultimately shape students' academic quality (Schmid & Haukedal, 2022; Smith-Adcock et al., 2019). So, it can be concluded that this motivation greatly influences the achievement of student academic achievement. McCoach and Siegle's (2003) theory contributes significantly to knowledge about the role of motivation in student academic achievement. This theory emphasises that motivation is a predictor variable for student academic achievement. In addition, the theory of motivation also involves competence and self-efficacy which can determine the success and failure of students at school.

2.2 Locus of Control

The concept of locus of control theory is a concept that raises individual control such as responsibility, choice, desire, control over what the individual achieves (Çelik et al., 2015; Kim et al., 2017). This locus of control theory assumes that individual success is highly dependent on the individual's ability to control himself. Locus of control is a personality trait that is not included in the bloom taxonomy (Smith-Adcock et al., 2019; Zhang et al., 2023). Individual success depends on the concept of the level of their belief in the ability to control their own life, including the ability to appreciate their own personal achievements. Locus of control itself is built from social learning theory. This theory is considered as a desire or hope which is the relationship between individual character and behaviour or achievements that have been achieved. This locus of control is closely related to the individual's belief in the existence of a relationship between actions and the results they achieve (Lanz, 2020; Trigueros et al., 2022). Internal locus of control in individuals refers to the concept that individual results or achievements depend on the individual's efforts to achieve their desires. External locus refers to the concept that individual results or achievements depend on their environment, not on their own efforts. One manifestation of the individual's internal locus of control is responsibility for the desired results with action, effort, quality improvement, and individual character in achieving the desired results, while the form of the external locus of control is that the individual does not put much effort into himself but hopes for luck, social life and help from other individuals.

Researchers agree that this locus of control makes a significant contribution to student academic achievement. Students who have superior academic achievement tend to try to link the results with the actions they take (Cardozo et al., 2022; Schmid & Haukedal, 2022). However, students who are less superior often think that failure is a test, part of life's difficulties, and a fate that is predetermined. The achievement of this academic achievement is strongly influenced by the student's internal and external locus of control. In general, superior academic achievement is determined by a positive correlation between internal control and academic success. However, the lack of academic achievement is caused by a negative correlation between external controls and academic achievement (Bevilacqua et al., 2020; Hart et al., 2021). Previous studies have found that this locus of control has a significant effect on the efforts or actions taken by individuals (Ershadi et al., 2021; Gutman, 2020). So, individuals with internal locus types always link results with their efforts or actions in achieving their desires. Individuals with the external locus type often associate outcomes with events or their environment. Based on the results of previous research surveys, students who have an internal locus tend to be happier, more independent, and more able to enjoy the results if they get success, in general, they are physically healthier (Bevilacqua et al., 2020; Hart et al., 2021). On the whole, locus of control not only helps academic achievement, but also helps develop self-quality. When compared between the internal and the external locus of control, this internal locus of control was found to have a more significant contribution to academic achievement in early and middle age students. Other research proves that the internal locus of control also contributes more to male students than to female students. This internal locus of control will

work when students face material or tasks that are quite difficult, are motivated to learn and obtain academic achievement.

2.3 Resilience

Resilience is a concern of psychologists nowadays because this resilience is a very vital aspect in helping students when facing various difficulties (Aliyev et al., 2021; Dray et al., 2014). Based on previous research, this resilience is an aspect of individual development that functions as a barrier if the individual experiences difficulties or challenges (Jore, 2020; Kim et al., 2018). Research on resilience in the field of education leads to the ability of students to withstand difficulties and challenges until they are able to achieve optimal academic results. In addition, research on gifted children has also shown a positive correlation between resilience and talent. This resistance is divided into two, namely intrinsic resistance and extrinsic resilience. Intrinsic resilience is a factor that can provide a sense of security, positive self-esteem, competence, a sense of superiority, mastery and self-control of one's strengths and weaknesses (Meng et al., 2018; Ozturk & Mohler, 2021). Extrinsic factors that affect resilience are relationships, access, support from family, friends, and positive experiences that have been experienced. Interventions given to students in order to understand resilience can hold on to these intrinsic and extrinsic factors. Intrinsic and extrinsic factors can be used as interventions and results can be achieved through long-term interventions and can be measured. Resilience cannot be defined by a single concept. However, at its core, resilience is the ability of individuals to get back up and develop themselves when faced with difficulties or challenges. Student resilience does not only come from internal but resilience is also influenced by external aspects. The resilience of these students can be optimised by teaching that their academic ability is not fixed, but academic ability can be improved through optimal effort (Meng et al., 2018; Wasonga, 2002). A tough student means not only having cognitive ability, but being able to withstand adversity and be able to bounce back after getting a test. So, resilience is a complex interaction between the individual and the surrounding environment.

Several studies have found that the level of intelligence is a key aspect of student resilience (Ershadi et al., 2021; Huang et al., 2021). This level of intelligence really helps students in understanding difficult situations or circumstances and helps students to make decisions. Jaid () said good intelligence helps students to manage their self-control and level of sensitivity to the situation they face. Previous studies have found that students who have high intelligence and who are able to cope with pressure tend to have better resilience (Hart et al., 2021; Mętel et al., 2022). The emotional reaction that tolerates difficult circumstances is the cause of the stronger resilience that students have. Emotional reactions that can affect resilience are such as predisposition, patience, and spaciousness. Other studies have found that there are several individual characteristics that can strengthen resilience and the negative impact of tests or difficult circumstances such as problem-solving skills, humour, morals and hobbies (Aliyev et al., 2021; Dray et al., 2014). Besides that, there are other opinions that resilience is also related to social abilities. Characteristics of students who have good resilience are adaptive, flexible, autonomous, future-oriented, positive

towards self-assessment, and communication skills, internal locus of control and planning (Kim et al., 2017; Romano et al., 2019). These abilities are found in students who have superior talent. In addition, the relationship between students and the environment is also a factor strengthening resilience, such as the relationship between students and other students at school, with their families at home, and the community. This relationship can also widen students' opportunities to improve their performance at school. Besides that, student participation in class, outside class, and the community also influences academic resilience. Through this participation, students can form self-confidence, value and self-esteem, achievement, and meaningful relationships with their friends.

Students who have good resilience tend to have good problem-solving skills too because they can ask for help from students or teachers on the basis of connection. Another study found that high school students who excel in their academic abilities have support from their families, which increases their self-confidence so that they are able to develop themselves positively (Chan et al., 2021; Kennett et al., 2021). Apart from the family, participating in extracurricular activities also contributes to student academic achievement. However, this does not happen to all students. Based on the literature study, through this study, researchers tried to investigate the differences in the influence of motivational variables, locus of control, and resistance to optimal learning potential. Therefore, the researcher formulated the research questions as:

1) Does the resilience of outstanding students differ based on their internal locus of control?
2) How can gender and talent influence internal locus and student resilience?

3. Methodology

3.1 Research Design

This study uses a factorial design analysis research method, through causal comparative to investigate the role of locus of control, resilience, gender, talent, on student achievement of high schools and the relationship between these variables (Çelik et al., 2015). The resilience variable in this study is divided into three parts, namely mastery, relatedness, and individual emotional reactivity. In addition, the variables involved are gender, IQ or talent, and student academic achievement. In this study there was no intervention, but data collection was carried out in two school semesters or one year to accommodate changes in perceptions regarding student resilience and motivation.

3.2 Participants

This research involved 550 students from five high schools. Schools were selected based on those representing low, middle and high clustering in the city of Bandung, Indonesia. Based on the concept of resilience, the students selected were in grades 11 and 12 because in this class students had already experienced various exams and assignments, so they already had good skills in verbal and numerical aspects. In addition, students in this class already have the ability to adapt to their learning environment. Students begin to get to know the school environment and their friends when they enter grade 11. In addition, grades 11 and 12 are also a transitional period when students begin to receive learning

materials that are challenging and complex, so that students' adaptive abilities with these difficulties have begun to form. When students are faced with learning material that is quite difficult, some of them will feel challenged, but there are also students who feel threatened and motivated to solve these difficulties. This research is causal comparative with the method of factorial design analysis to investigate the role of locus of control, resilience, gender, and talent in student academic achievement and the relationship between these variables. The resilience variable in this study is divided into three parts, namely mastery, relatedness and individual emotional reactivity. In addition, the variables involved are gender, IQ or talent, and student academic achievement.

3.3 Research instrument

Researchers used an a priori survey instrument to reveal the relationship between these variables. By looking at data from student perceptions, researchers investigated the role of motivation and resilience in student achievement. The instruments used in this study were a questionnaire instrument to obtain participant demographic data and a survey instrument to obtain internal control data. Researchers surveyed locus of control data using the internal and external control scales for adult learners adopted from Nowicki-Strickland (Çelik et al., 2015). This scale was created to evaluate students' locus of control. The way to read this scale is simple and has a very satisfactory level of reliability and validity and meets the criteria for large-scale research. The items used on a binary scale are 25 items with a score range of 0-25. The highest score indicates a focus on the extrinsic. In addition, the internal consistency of the scale is at a value = 0.65-0.70 in this study. This scale meets the criteria for use in senior high school students and is in accordance with the criteria for the scale used in previous studies. Furthermore, the scale used to measure resilience is the resilience scale for adolescent students adopted from Embury (2007). This scale is divided into three subscales, namely sense of mastery, relatedness, and emotional reactivity. The number of items on this scale is 65 items using a 5-point Likert scale. The score range for each subscale, namely the sense of mastery and emotional reactivity scale, is 0-85, and the total score on the sense of relatedness scale ranges from 0-96. Internal consistency on the three scales is a = 0.90-0.95. These results are in accordance with the scale in previous studies conducted on students aged 15-19. In addition, Cronbach's alpha values in this study were in the range .93–.96. This research has received approval from stakeholders from the school concerned, parents, and students who participated in the research. The data on the talents and academic achievements of the students participating in this study were obtained from the school's data. The internal consistency of the scale in this study is in the range of 0.80-0.90. Scoring is done based on the system intelligence quotient. The mean score is 100 and the standard deviation is performed on 15 units. The survey was conducted in various subject areas. The variables that are of primary concern in this study are locus of control, resilience, gender, talent and their contribution to student academic achievement.

3.4 Data collection and data analysis

After obtaining permission from the school and participants, the researcher explained the purpose of the research to the students and they were given the opportunity to ask questions about the research project. Furthermore, researchers coordinated with schools to provide opportunities for students to fill out the surveys provided. Before students filled out the survey, they were asked to fill out a consent statement by signing virtually then filling out a survey via the internet which could be accessed by students at any time during the research period. Researchers used the Qualtrics platform for the survey and conducted it for two semesters. The survey was conducted twice to see the consistency of the surveys conducted in the first and second semesters. The first survey was carried out at each other's homes, but the second survey was carried out together at school through the gadgets they had. Students who were absent from both surveys were not involved in data analysis. Only students who completed all surveys twice were included in the data analysis. Processing of survey results data was done by uploading from Qualtrics to the SPSS program. Data analysis was performed using complex statistical analysis, such as t-test, ANOVA test (Analysis of variances), and MANOVA (Multivariate Analysis of Variance).

4. Results

From the results of data collection, 550 students were able to complete the survey at both stages. The percentage of gender who filled out the survey was 55% male and 45% female who completed the survey at both stages. The percentage of participating classes was 50% for 11th grade and 50% for 12th grade. In addition, the age range of students participating in the study was 15-18 years. The majority ethnic proportion comes from Sundanese ethnicity living in West Java province and only a small proportion are immigrant students from various provinces and islands (10%). The first language of students participating is Sundanese (30%), Indonesian (50%), and English (20%). Students whose first language is English come from international schools during their junior high school. The schools that were chosen were schools that were included in the favourite category or it could be said that only students who had superior academic abilities could attend these five schools. So, ethnically, the students who attend the top schools are quite diverse. In addition, the average income of their parents is in the middle and high income range. Of the five schools participating in the study, three were public schools and two were private schools. The educational level of parents was also revealed in this study and is listed in Table 1. From the results of the analysis, there is not much difference from the highest educational level of the mothers and fathers. Fathers have a slightly higher level of education with a bachelor's degree, while many mothers are high school graduates. In addition, some of their parents took vocational education in economics, trade and carpentry. The results of the analysis of students' academic abilities and talents are shown in Table 1.

Table 1. Achievement score of academic achievement, aptitude, and overall ability of students

	Ability		Attainment		Overall	
	M	SD	M	SD	M	SD
Males	82.11	9.76	80.24	11.61	82.40	8.92
Females	72.45	8.30	80.64	11.35	76.89	8.71
Overall	74.56	8.26	80.35	11.35	76.60	8.80

Data collection was carried out twice, the first was carried out at the end of the first semester, namely in the middle of the year, the second was carried out in the second semester, namely the end of the year. The researcher used the MANOVA test to investigate the level of locus control of students. The MANOVA test was conducted to see the difference between students who have a focus on internal locus of control and students who focus on external locus of control. Researchers carried out statistical analysis procedures based on Pallant (2013). The results of the researcher's MANOVA test are presented in Table 2. Based on Pallant's criteria, the results of the analysis show that there is sufficient interaction for the MANOVA test to be carried out based on the assumed level of multicollinearity. Researchers grouped students based on the locus of control scores obtained. Locus of control scores that are at 0-7 are grouped into students who focus on internal locus of control, while students who get locus of control scores with a range of 8-20 are grouped on students with external locus of control, and students who get locus of control scores with a range 7-9 are grouped on students who use internal and external (mixed) locus of control. Students who were in the third group or mixed group were not involved in data analysis. The grouping of students is based on psychological test data and student academic achievement.

Table 2. The relationship between resilience action attitudes and students' locus of control in the first and second semesters

	SM 1	SM 2	S 1	S 2	ER 1	ER 2	LC 1	LC 2
Sense of Mastery Semester 1	–							
Sense of Mastery Semester 2	.875**	–						
Sense of Sensitivity Semester 1	−.367**	−.346**	–					
Sense of Sensitivity Semester 2	−.356**	−.324*	.731**	–				
Emotional Reactivity Semester 1	−.520**	−.475**	.953**	.652**	–			
Emotional Reactivity Semester 2	−.534**	−.421**	.650**	.873**	.730**	–		

Locus of Control Semester 1	−.562**	−.420**	.321*	.262	.387**	.390**	–
Locus of Control Semester 2	−.561**	−.590**	.391**	.380**	.456**	.473**	.657** –

SM : Sense of Mastery, S: Sense of Sensitivity: ER: Emotional Reactivity, LC: Locus of Control

Table 3. The ability of students in each aspect in both groups

Aspect	Time 1				Time 2			
	Internal Locus (n = 275)		External Locus (n = 275)		Internal Locus (n = 275)		External Locus (n = 275)	
	M	SD	M	SD	M	SD	M	SD
*Verbal IQ	80.21	13.42	78.21	15.23	81.65	12.76	74.54	13.80
*Numerical IQ	85.72	11.70	85.12	13.76	85.30	11.49	81.24	15.12
*Reading	78.25	17.90	80.78	16.24	80.21	14.53	76.22	20.31
*Math	80.12	16.24	84.30	15.81	80.91	15.73	85.14	14.80

Next, the achievement scores and student aptitude were described based on the locus of control group in the first and second semester in table 3. The t test was carried out using the alpha level of Bonferroni with an alpha value of 0.017. Based on the results, it was found that there was no significant difference between verbal IQ scores, numerical IQ scores, reading and mathematics in students with internal and external locus and during the first and second semesters. Through the MANOVA test, it makes it easier for researchers to see comparisons of self-concept and resilience steps taken between students with internal and external loci. Based on the results of the one-way MANOVA test, there was a significant difference in the resilience scale of student groups with internal and external locus in the first and second semesters. Measurements were made using three resilience subscales performed on adolescent students (Prince-Embury, 2007) with a value of $F (4, 89) = 17.154$, $p < .001$ partial eta2 = .346. The findings show that there are significant differences in each variable at an alpha level of 0.017. Based on the results of the analysis, in the first semester it was found that students had a superior sense of mastery with a value of $F(1, 98) = 30.95$, $p < . 0001$, partial eta2 = 0.361 from students with external locus of control. Furthermore, it was found that the level of students' emotional reactivity was lower than external students with a value of $F(1, 96) = 26.57$, $p <0.0001$, partial eta2 = 0.241. Lastly, a higher sense of relatedness was found with a value of $F(1, 95) = 9.70$, $p = .002$, partial eta2 = .087 than external students.

Furthermore, a one-way MANOVA test was carried out in each group to investigate the different roles of the investigated variables in both internal and external locus student groups. Based on the results of the MANOVA test, it was found that there is a different and significant resilience between internal and external locus of control students in the second semester with grades $F(3, 94) = 9.40$, $p < .001$ partial eta2 = .342. Significant differences appear in each aspect of endurance with an alpha level of 0.017. Students with internal locus of control seem to have a better sense of mastery with a value of $F (1, 96) = 19.21$, $p <0.0001$,

partial eta2 = 0.160 in the first semester, but have a lower level of emotional reactivity in the second semester with a value of F(1, 93) = 12.60, p < .0001, partial eta2 = .136. Aspects of resilience that show another increase are in the group of students with internal locus of control with a value of F(1, 94) = 5.60, p = 0.04, partial eta2 = 0.060. However, it still has not reached significance after being adjusted to the Bonferroni standard. Significant differences between aspects of student resilience can be seen in Table 4.

Table 4. Average and standard deviation of resilience aspects in the first and second semesters

Aspect	Time 1				Time 2			
	Internal		External		Internal		External	
	M	SD	M	SD	M	SD	M	SD
Sense of Mastery	60.54	8.20	50.76	10.60	60.46	9.41	51.84	11.67
Emotional Reactivity	30.57	11.45	40.31	12.54	30.40	10.13	40.71	13.50
Sense of Relatedness	70.45	12.01	60.54	16.42	70.52	10.05	60.11	16.34

Researchers re-investigated student locus of control and resilience in the second semester to see the impact of studying for one year. One-way MANOVA test was conducted to see the difference between students with internal and external locus of control. Based on the results of the MANOVA test, a significant difference was found between groups of students with an internal locus of control and an external locus of control at the end of the second semester in student resilience with a value of F(3, 90) = 15.88, p <.001, partial eta2 = .356. In addition, aspects of individual student resilience also appear significant at a level that has been adjusted to the Bonferroni standard of 0.017. Based on the MANOVA test results described in Table 4, a better sense of mastery is possessed by groups of internal locus students with a value of F(1, 90) = 40.64, p <0.0001, partial eta2 = 0.447, and also a better sense of connectedness with a value of F(1, 91) = 31.42, p <.0001, partial eta-2 = .089 compared to external locus of control students. However, students with an internal locus of control had lower emotional reactivity than the group of students with an external locus of control with a value of F(1, 87) = 16.84, p <.0001, partial eta2 = .164.

5. Discussion

The findings of this study indicate that there is a significant difference between the group of internal locus students and with external locus students on the resilience aspect. This is consistent with the theory that this locus of control has an impact on students' attitudes and behaviour because students place themselves according to their locus of control, which is depending on their own abilities and the environment or help from those around them. In the first phase of the survey conducted in the first semester, The sense of mastery and relatedness to internal locus students is better than that of external locus of control (Spilg et al., 2022; Suranata et al., 2020). However, it has lower emotional reactivity than the group of students with external locus of control. The survey in the second phase, which was conducted at the end of the second semester

showed the same results, although the sense of connection was not very significant. The grouping composition in the second semester was slightly different, namely the group of students with less internal locus of control and the group of students with an external locus of control.

The measurement results in the second stage showed that internal locus students had a better sense of mastery and a sense of connection than the group of students with an external locus of control. In addition, the reactivity level of the group of students with an internal locus of control also showed the same results, which was lower than that of the group of students with an external locus of control (Bell et al., 2020; Chan et al., 2021). This is the result of learning experiences that have undergone various challenges for two semesters or one year. From the results of the analysis of these two semesters, the male sex experienced a significant change in the aspect of resilience. Male students with internal groups experience decreased aspects of resilience compared to female students. This happens due to the experience of increasing learning challenges or they are too worried about evaluating their appearance in the eyes of others (Hadianto et al., 2021a, 2021b; Smith-Adcock et al., 2019). In addition, male students are also due to a lack of focus on efforts or actions to master learning material and their level of toughness is less than that of women. This happened to the majority of male students even though there were male students who had strong toughness but not as many as female students. The findings of this study reinforce previous research that female students tend to have superior resilience to male students.

Changes occurred slightly in the male and female sexes in the internal group. The changes are listed in Table 4. Based on the survey results in the first semester, the group verbal and numerical IQ scores on internal locus of control students are superior, but reading and math scores are lower than students with external locus of control. Students who are in the internal group, based on survey results in the second semester, have stronger confidence in their own abilities in doing business to deal with the difficulties or challenges they face. This belief seems to have increased in the group of students with internal locus of control. This is coherent with the results of previous studies regarding student perceptions of abilities and talents (Aliyev et al., 2021; Dray et al., 2014). Students view that these two aspects will experience non-permanent changes. Groups of internal locus of control students will tend to have superior academic abilities because their view of challenges is as something that can develop their academic abilities. This view will, from time to time, certainly make students experience an increase in ability. This is in accordance with previous studies that the confidence of students who have high intelligence and talent will make believe the talent and intelligence they have is something that is fixed, but will experience an increase if they are able to face challenges and difficulties (Bevilacqua et al., 2020; Markantoni et al., 2019).

Subsequent findings from groups of students with internal and external loci of control were that the verbal IQ scores and students' reading skills were better than the scores of mathematical abilities. In addition, verbal IQ is also better than comparative reading ability, but lower math IQ and comparative ability. This

finding explains that the ability of the internal locus of control of male students is lower in mathematics scores, one of which is because male students tend to have different mathematical abilities at the start of 10th grade school than female students. This finding is consistent with the theory that locus of control is a personality trait that describes students' views of the relationship between action and appreciation or academic achievement (Aliyev et al., 2021; Bester & Kuyper, 2020). This is an indicator that students' self-ability plays a role in contributing to their academic achievements compared to the contribution of the environment. Students with an internal locus of control perceive that academic achievement is a causality of their own abilities. Thus, groups of students with an internal locus of control have a more flexible view of their abilities, so that they are more effective in dealing with academic and social obstacles (Dray et al., 2014; Hart et al., 2021). The results of this study reinforce the findings of previous research that students' locus of control greatly influences the improvement of students' abilities and academic achievement (Aliyev et al., 2021; Bester & Kuyper, 2020).

The results of the research in this study may be influenced by an environment that is neutral towards the gender of students; schools provide the same motivation and encouragement to both male and female students. Students in each of the internal and external control groups explained that the correlation between aptitude and locus of control was stronger than that of locus of control and achievement. Students who have an internal locus of control have better talent than achievement, but the difference is not too significant. In addition, the external locus of control also contributes to the development of academic abilities due to feedback obtained from the environment, but not more significantly than the group of internal locus students (Bell et al., 2020; Chan et al., 2021). Differences in resilience caused by locus of control owned by students are of concern to teachers. Based on the research findings, the internal locus of control student group has higher resilience than the external locus student group; thus, teachers must facilitate students to have an internal locus of control by guiding or giving confidence in the students' own abilities. This locus of control is seen as a characteristic, trait or personality that is relatively stable and can be formed by habit. One way that can be done by stakeholders and teachers is to modify the terms of reference of the learning process which facilitates students to shift their focus from an external locus of control to an internal locus of control.

6. Conclusion, Limitation and Recommendation

Based on the research findings, it can be concluded that students with an internal locus of control have more significant academic resilience and achievement than the group of students with an external locus of control. Students who focus on internal aspects (internal locus of control) are more resilient and better at overcoming difficulties. In addition, student resilience also affects the ability to solve student academic challenges. This internal locus of control and resilience can be shaped by the design of a learning process that encourages students to believe in their own abilities and not depend on others. In addition, stakeholders must also provide a frame of reference either in the

form of a curriculum or other policies that encourage students to be dominated by an internal locus of control.

This study has several limitations, including the sample which is relatively small so it still needs to be improved to make it more representative. In addition, the level of intelligence in the sample is still disproportionate which is dominated by samples that have superior intelligence, which is relatively short for two semesters in one school year. Based on these limitations, further research should involve a wider and larger sample. In addition, further research should be carried out on students with even intelligence, and carried out in a longer time, for example, carried out while students are taking one level of school. In addition, the analysis needs to be strengthened with regression analysis in order to be able to predict other variables that might affect student academic achievement.

Based on the research findings, the researcher recommends that stakeholders and teachers modify the terms of reference of the learning process to shift students' focus from external to internal locus of control. This modification or change can strengthen student resilience, so that students become more resilient. This research has implications that teachers should assist students in increasing their focus towards internal loci of control rather than towards external loci of control because this locus of control is a very important factor so that students have strong resilience and have high academic ability. Guiding these students can be done by setting a learning environment that must encourage students to be confident in their abilities and not depend on the external environment or other people.

7. References

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