

The mediating role of adversity quotient and the moderating role of gender on the effect of self-regulated learning on academic procrastination in completing a thesis

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Abstract The final project is one of the strategies to train students' abilities. Still, it often causes problems in the form of delays in thesis completion which are influenced by Self-Regulated Learning (SRL) and the role of Adversity Quotient (AQ) as a mediator. This study aims to analyze the effect of SRL on Academic Procrastination in Thesis Completion (APCT) mediated by AQ, with Gender (G) as a moderating variable. The research subjects were Economics Education students of Sebelas Maret University (UNS) and Semarang State University (UNNES) class of 2018-2019 who had not completed their thesis (N=110), selected through proportional random sampling method from a population of 150 people. Data collection was conducted through a survey with a measured scale for each variable and analyzed using Moderated Path Analysis with the help of SmartPLS 4 and the PLS-SEM model. The results showed that SRL had a significant negative effect on APCT, AQ mediated the relationship between SRL and APCT, but G did not moderate the relationship. The implications of this study indicate that procrastination in final-year students can be minimized by strengthening the role of SRL and AQ. Research limitations and recommendations are also presented for further research.

Keywords: academic procrastination in completing a thesis, self-regulated learning, adversity quotient, final year students, mediation-moderation

1. introduction

In higher education at the undergraduate level, there are two main program pathways: research-based programs and coursework-based programs (Stofer et al., 2021). Research-based programs emphasize research activities as the main component, while coursework-based programs focus more on general learning and practice (Matusiak & Bright, 2020). The fundamental difference between the two programs lies in the graduation requirements that must be met by the students. In the United States, for example, general course programs do not require a thesis as a graduation requirement. On the other hand, in Indonesia, both program pathways are regulated by the Minister of Education, Culture, Research, and Technology Regulation (Permendikbud Ristek) Number 53 of 2013. In 2023, it states that the competencies of graduates at the undergraduate level are considered achieved when students have met the requirements to complete their final project or bachelor thesis.

The assignment of thesis writing is one of the efforts of higher education institutions to create human resources with superior skills and abilities in their fields by giving academic tasks to their students; however, this assignment often leads to new problems (Yupanqui-Lorenzo et al., 2023). Students usually face difficulties in managing their time, feel afraid of failure (Agirakca-Dinc & Eksi, 2019), experience pressure to complete academic tasks, and suffer from stress and academic fatigue, leading them to prefer engaging in other enjoyable activities (Giray et al., 2023; Kuftyak, 2022). This condition often leads students to procrastinate in completing academic tasks, known as academic procrastination (AP), and negatively impacts their academic achievements (Sefriani et al., 2022). The more severe negative impact also affects the mental health of students, which in some extreme cases can increase the risk of suicide (Kementerian Kesehatan Republik Indonesia, 2023).

The Centers for Disease Control and Prevention (CDC) reported that in 2022, nearly 45% of students in America experienced feelings of sadness and hopelessness, especially during the pandemic, with as many as 20% of students having serious thoughts of suicide. In Indonesia, a report from the World Health Organization (WHO) indicates that in 2019 there were 6,544 cases of suicide, with one of the causes stemming from the educational environment (Kompas.id, 2023; Rappler.com, 2016). Furthermore, Utami (Kompas.id, 2023) reported that Indonesia ranks third among 21 countries, with

29% of the population aged 15-24 frequently experiencing depression and a loss of interest in activities. According to suicidology experts, 34.5% of students have suicidal thoughts, one of the causes being academic problems. If we know in detail about the impact and patterns of academic procrastination (AP), we can intervene to reduce such behavior (Zacks & Hen, 2018). Therefore, this issue is important as it relates to influencing the psychological well-being of students (Dardara & Al-Makhalid, 2022) by understanding the sources, causes, and ways to reduce academic procrastination (Svartdal et al., 2020). Through well-designed programs and curricula, higher education institutions can reflect the quality of the institution in providing education while also helping students reduce AP behavior, especially in completing their undergraduate thesis as a final project (Peixoto et al., 2021).

At the theoretical level, academics' attention to research related to AP in higher education requires further study. Previous research on AP has sparked debate regarding the research findings. Touloupis and Campbell (2024), in their research using quantitative field research methods, found that students tend to try to suppress academic pressure, while Sepiadou and Metallidou (2023) state that students' attitudes towards academic pressure become higher when they feel that academic tasks they face are too challenging and there is a significant gap between personal standards and achievements. AP behavior in students is influenced by various factors, one of which is self-regulated learning (SRL).

AP has a relationship with SRL (Ma et al., 2022). The SRL factor shows a strong but negatively correlated relationship with AP (Amani, 2020; de la Fuente et al., 2021; Filiz & Dogar, 2021; Zarrin et al., 2020). This finding differs from the research by Fitriya dan Lukmawati (2017), which shows that SRL has a positive influence on AP. The behavior of procrastination toward academic obligations often leads to a sense of irresponsibility, so integrating several strategies can become an effective solution. The application of Social Cognitive Theory (SCT) needs to be re-evaluated, especially in the context of topics that influence an individual's behavior. Self-Regulated Learning (SRL) needs to be adopted by students so that they can manage themselves well in the academic field (Ulfatun et al., 2021). Self-Regulated Learning (SRL) begins with a detailed and clear understanding of the goals to be achieved, allowing individuals to set specific, measurable, and realistic objectives within a certain timeframe (Wilby, 2022). This concept heavily relies on an individual's ability to manage time effectively by identifying priorities and creating a realistic schedule. Zimmerman (1990) concluded that the concept of SRL emphasizes the importance of students choosing, organizing, and creating learning activities that are beneficial for themselves and their environment through careful planning and self-regulation.

Academic procrastination often occurs among final-year students, especially concerning the completion of their theses. In Indonesia, the obligation to complete a final project at the undergraduate level is known as a "skripsi". The main objective of this policy is to develop analytical, logical, and critical thinking skills, as well as originality, and to contribute to the advancement of knowledge in specific fields (Azmat & Ahmad, 2022). A thesis is a very important scientific work for students, as it is a requirement for graduation at the undergraduate level. The preparation of a thesis involves the principles and rules established regarding structure, systematics, and format, thereby training students to develop scientific thinking and writing skills (Haryono & Adam, 2021). Among all these provisions, it is not uncommon to encounter students who procrastinate, meaning they deliberately and repeatedly postpone important tasks related to academic assignments (Solomon & Rothblum, 1984). This habit is influenced by two main factors, namely internal and external factors, one of which is Self-Regulated Learning (SRL). According to the concept of Social Cognitive Theory (SCT) proposed by Bandura (1977), a person's behavior is shaped by the interaction between personal factors and environmental factors.

The integrated SRL concept in the academic field has the potential to make a significant impact. Individuals with good self-regulation can cope with a variety of problems through their ability to manage time, emotions, and overall behavior, thus minimizing the emergence of larger academic problems, including academic procrastination (Bytamar et al., 2020). The proper implementation of all phases of the SRL cycle can help address learning issues, lack of motivation, and time management, as well as levels of stress and anxiety, all of which impact procrastination behavior (Lindner et al., 2023). Based on the literature, SRL has a positive impact on various learning activities. Therefore, final-year students who possess high self-regulated learning (SRL) abilities tend to be able to reduce the emergence of academic procrastination (APCT), and vice versa. Based on this literature review, we propose the hypothesis that:

Hypothesis 1 (H1): SRL has a significant negative relationship with APCT.

The relationship between SRL and APCT is complex and can be influenced by other variables. One of these variables is the Adversity Quotient (AQ). AQ plays a crucial role in helping students strengthen their perseverance when facing challenges in everyday life while staying true to their principles and dreams and disregarding potential obstacles. AQ is one of the personal factor derivatives from Bandura's SCT theory (1977). In addition to personal and environmental factors, Rosário et al. (2009) emphasize the importance of moderation and mediation variables to understand the roles of enhancers and intermediaries in influencing the relationship between independent and dependent variables, where in this context, AQ and gender serve as those variables. AQ is the ability of individuals to endure and seek solutions when facing various challenges and difficulties by changing their mindset and attitude in dealing with obstacles (Suryandari & Yuliana, 2023). In line with Sitsira-at (2020), AQ reflects an individual's perseverance in overcoming barriers and challenges to achieve the desired level of success; this concept is related to students' ability regarding self-regulated learning (SRL). A good AQ ability in final-year

students can influence their behavior in completing academic obligations, such as their thesis. This concept supports the statement by Rosário et al. (2009) that AQ can act as a moderating variable, as it can strengthen or weaken students' academic procrastination behavior in completing their thesis.

The role of gender has also been explored as a moderating factor in the relationship between SRL and APCT, with mixed findings on whether there are differences between male and female students in designing strategies against academic procrastination behavior (Noviani et al., 2023). The role of gender as a moderating variable aims to determine whether there are differences in self-regulated learning (SRL) abilities among final-year students based on gender in the formation of academic procrastination coping tactics (APCT). Through this moderation, in addition to understanding the differences in influence among students, further identification is needed to ascertain whether moderation occurs to address the research issues. Therefore, we propose the following hypothesis:

Hypothesis 2 (H2): AQ mediates the influence of SRL on APCT.

Hypothesis 3 (H3): Gender moderates the effect of SRL on APCT.

The phenomenon of AP behavior in thesis completion is an important topic to study because most previous research has focused on AP in general, whether through quantitative or qualitative approaches. Although various studies have identified the impacts and predictors of academic procrastination, specific research on academic procrastination in completing theses is still rarely found. This research aims to fill that gap by investigating whether SRL affects APCT and examining the roles of mediating and moderating predictors. Specifically, this research aims to understand the influence of SRL on APCT behavior among final-year students after considering mediating and moderating variables.

Our interest in APCT among students at two universities in Central Java Province is based on several reasons. First, the number of suicide cases among teenagers continues to rise, with one of the contributing factors being academic pressure (Rappler.com, 2016). Furthermore, in Indonesia, Central Java Province has recorded the highest number of suicide cases nationally (Rizaty, 2023). In addition, Central Java Province has the fourth largest number of state university students in Indonesia. Secondly, the length of time it takes for students to complete their education until graduation affects the assessment of study programs (Malelak et al., 2021). Based on the National Higher Education Standards (SN Dikti) regulated by the Minister of Education and Culture Regulation Number 3 of 2020 National Higher Education Standards (2020), the duration of students' studies affects their active status in the higher education database. (PD DIKTI). The gap ratio between the number of graduates and active students, which reaches 1:5 at the bachelor's/diploma level, also indicates a problem in educational efficiency. Thirdly, the status of legal entities owned by State Universities in Central Java with the ownership of economics education study programs is only Sebelas Maret University (UNS) and Semarang State University (UNNES). In Indonesia, the status of a legal entity in this state university has the right to be autonomously managed both academic and non-academic. This condition is one of the efforts given by the government in providing autonomy to state universities to be able to realize world-class universities so that the quality of the human resources produced has superior competence. Fourthly, the longer the duration of a student's studies is, the greater the time and costs required, which impacts the cost of economic opportunity. Students who exceed the normal study period will lose the opportunity to work and earn income and will also have to bear additional costs to fulfill their longer educational obligations (Hasibuan et al., 2021). Therefore, it is important to investigate this issue practically.

To the best of our knowledge, this is the first study that specifically examines the relationship between self-regulated learning (SRL) and academic procrastination in completing theses (APCT), involving adversity quotient (AQ) as a mediating-moderating variable of gender within a single model framework that can strengthen, weaken, or mediate that relationship. This study provides three main contributions to the advancement of research in this field. First, although some studies have investigated AP among students, this research specifically focuses on APCT among final-year students. Second, while previous research has explored APCT, this study expands the literature by involving SRL as a key predictor. Third, although some recent studies have utilized moderation or mediation variables, this research contributes by combining both types of variables into a single model framework, designed to fill the gaps in the existing literature.

This paper examines research in the following sections. Section 2 explains our research methods, including the study model, population and sample, data collection instruments, procedures, and data analysis. Section 3 presents the results of the event study methodology and moderated path analysis tests. Section 4 provides conclusions, implications, and limitations of this study.

2. Materials and Methods

2.1. Study model

This research uses a quantitative approach and is designed to determine the effect of intervention variables (Creswell, 2003). The main objective of this research is to explore how Self-Regulated Learning (SRL) affects Academic Procrastination in Completing Thesis (APCT), with Adversity Quotient (AQ) as a mediating variable and gender as a moderating variable. Moderation analysis is used to identify variables that can strengthen, weaken, or eliminate the influence between

independent and dependent variables (Ghozali, 2018). Meanwhile, mediation analysis aims to determine the role of the variable that mediates the influence between SRL and APCT. In this study, SRL functions as the independent variable, APCT as the dependent variable, and AQ and gender as the mediating and moderating variables. The research model is visualized in Figure 1.

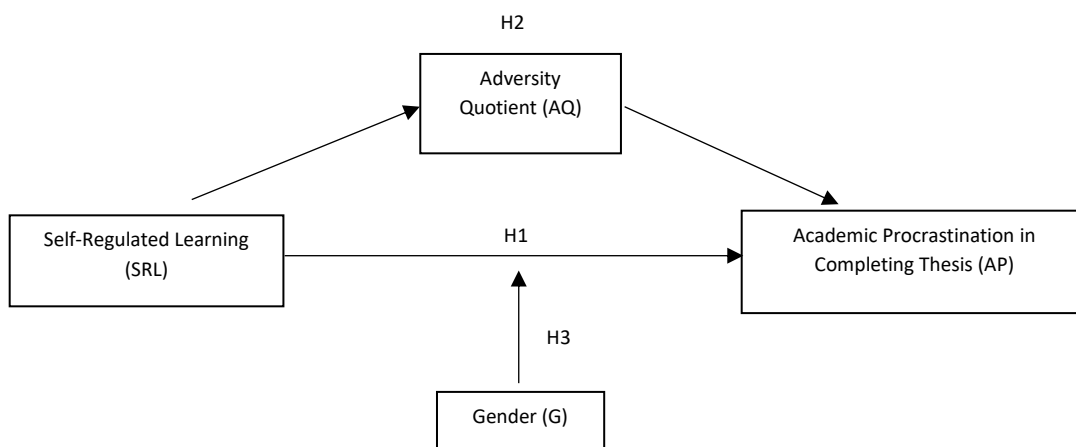


Figure 1 Research Model.

2.2. Population

This research involves the population of undergraduate students from Sebelas Maret University (UNS) and Semarang State University (UNNES) from the 2018-2019 cohort who have exceeded the normal study period but have not yet completed their final project in the form of a thesis. The sample size was calculated using Slovin's formula, resulting in 110 respondents. The respondents consisted of final-year students from the Economics/Education Cooperative study programs at UNS and UNNES, as presented in table 1. Then the research sample was selected using the proportional random sampling method of the population to ensure that each member has the same opportunity to become a sample member (Sugiyono, 2021). Proportional Random Sampling Using the Slovin Formula $n = \frac{N}{1+Ne^2} \times 100\%$ with a margin of error tolerance of 5%, so that as many as 110 respondents were obtained.

Table 1 Research Population.

No	College	Force	No. of Total Student	No. of People Who Have Not Yet Passed
1	Universitas Sebelas Maret	2018	88	17
		2019	80	55
2	Universitas Negeri Semarang	2018	110	26
		2019	121	52
Total Populasi			399	150

2.2 Data collection instrument

Research data were collected using the SRL scale (SRLS), the APCT scale (APS), the adversity quotient scale (AQS), and a dummy variable for gender (G). Data collection was conducted through Google Forms using a Likert scale, where the score options range from strongly agree (4) to strongly disagree. (1). The research procedure consists of three stages: the search, the development, and the adoption of measurement tools for each independent variable, moderation, mediation, and dependent variable. Data collection was conducted twice during May 2024, first for testing the validity and reliability of the instruments and second for the actual data gathering. Data processing involves validity and reliability testing using IBM SPSS Statistics 26. Table 2 presents the results of the validity test of each research instrument, and the reliability is presented in the following table 3.

Hypothesis testing regarding the correlation of SRL to APCT with AQ as the mediating variable and gender as the moderating variable was analyzed using SmartPLS 4 with a PLS-SEM model. The SmartPLS 4 analysis tool with the PLS-SEM model was chosen to test the hypothesis for two reasons: first, the ability to handle complex models by analyzing structural relationships involving moderation and mediation variables in the study (Aimran et al., 2015). Second, the size of the research sample is relatively small (Hair & Alamer, 2022), namely 110 students. PLS-SEM is considered more accurate and efficient than other methods.



Table 2 Validity Test Results.

Items	P value	Sig. Value	R _{value}	r _{table}	
Self-regulated learning					
Items1	0,000	0,05	0,704	0,361	Valid
Items2	0,000	0,05	0,701	0,361	Valid
Items3	0,001	0,05	0,564	0,361	Valid
Items4	0,000	0,05	0,715	0,361	Valid
Items5	0,001	0,05	0,562	0,361	Valid
Items6	0,005	0,05	0,497	0,361	Valid
Adversity quotient					
Items7	0,045	0,05	0,368	0,361	Valid
Items8	0,003	0,05	0,526	0,361	Valid
Items9	0,037	0,05	0,382	0,361	Valid
Items10	0,000	0,05	0,685	0,361	Valid
Items11	0,085	0,05	0,320	0,361	Invalid
Items12	0,000	0,05	0,618	0,361	Valid
Items13	0,022	0,05	0,417	0,361	Valid
Items14	0,000	0,05	0,645	0,361	Valid
Items15	0,196	0,05	0,243	0,361	Invalid
Items16	0,031	0,05	0,395	0,361	Valid
Items17	0,012	0,05	0,453	0,361	Valid
Items18	0,001	0,05	0,563	0,361	Valid
Academic procrastination in completing thesis					
Items19	0,000	0,05	0,662	0,361	Valid
Items20	0,011	0,05	0,459	0,361	Valid
Items21	0,014	0,05	0,446	0,361	Valid
Items22	0,052	0,05	0,358	0,361	Invalid
Items23	0,017	0,05	0,433	0,361	Valid
Items24	0,008	0,05	0,473	0,361	Valid
Items25	0,033	0,05	0,390	0,361	Valid
Items26	0,000	0,05	0,654	0,361	Valid
Items27	0,076	0,05	0,329	0,361	Invalid
Items28	0,004	0,05	0,512	0,361	Valid
Items29	0,000	0,05	0,635	0,361	Valid
Items30	0,000	0,05	0,669	0,361	Valid
Items31	0,004	0,05	0,510	0,361	Valid
Items32	0,021	0,05	0,420	0,361	Valid
Items33	0,000	0,05	0,667	0,361	Valid

Table 3 Reliability Test Results.

	SRL	AQ	APCT
Cronbach's Alpha	0,679	0,690	0,794
N of Items	6	12	15

2.3. Data analysis

The data analysis was conducted using Moderated Path Analysis to describe and test hypotheses involving moderation and mediation within a single model, based on the analytical framework developed by Edwards and Lambert (2007). Empirical procedures include testing the validity and reliability of instruments as well as initial descriptive statistical analysis. Gradually, to test the hypothesis, we began by examining the correlation between SRL and APCT. Next, we investigated the moderating role in that relationship. To gain deeper insights into the role of gender in moderating the influence of SRL on APCT along with the mediated pathways, we developed a combined model. In the framework of this bubble analysis, we aim to explore the relationship between research variables and understand how gender can interact with SRL in the influence of APCT. Additionally, we also aim to explore the involvement between variables with the mediating effect of AQ in affecting SRL on APCT.



3. Results

Hypothesis testing begins by examining the relationship between SRL and APCT, as well as the mediating role of AQ in that relationship. The analysis results presented in Table 4 indicate that in Model 1, regression was conducted to test the mediating effect on the relationship between the variables. The results reveal that SRL is significantly and negatively related to changes in APCT, with a correlation of -0.295, or 29.5%. This indicates that SRL, particularly in the aspect of self-management, which includes the control of behavior, emotions, and thoughts, has a significant influence on behavioral control in the completion of academic tasks such as theses. Thus, hypothesis 1 is proven.

The results of this study are consistent with the research conducted by Brahma dan Saikia (2023) that SRL is capable of reducing AP in completing students' theses. The essence of self-regulation is the ability to choose the most effective strategy. Bandura (1977) defines self-regulated learning (SRL) as individual cognition, how individuals can regulate themselves, which in turn influences their behavior to achieve goals. The role of integrated SRL in academics has proven to influence students (García-Ros et al., 2023).

Hypothesis 2 observes the mediating role of AQ in the relationship between SRL and APCT. In the testing phase, we conducted a regression of AQ on SRL. Table 2 presents the results showing that SRL has a significant influence on AQ with a positive value of 0.734, or 73.4%. Based on the test results, it is known that the influence of the independent variable SRL on the mediating variable in this study is at a "high" level, meaning that a high level of SRL among final-year students strongly contributes to the increase of AQ in facing academic challenges.

In the next stage, we conducted a regression test on the mediating variable AQ with the variable APCT. The path coefficient value obtained an original sample value of 0.275 with a p-value of 0.021. Next, we included the AQ variable as a mediating variable between the influence of SRL on APCT. In the first hypothesis of models I and II in Table 2, it is evident that the SRL variable negatively affects the APCT variable. However, when we included the mediating variable AQ in the correlation between these two variables, it was able to change the value of the correlation between SRL and APCT. Based on the Resilience Theory by Norman Garmezy 1973 (Luthar, 2003) the AQ concept describes the extent to which individuals can turn difficulties into opportunities and still survive in difficult situations. Individuals who have high psychological resilience will be better able to face academic difficulties and overcome the tendency to procrastinate on work. When AQ was included in the correlation test, AQ was proven to be able to influence the correlation of SRL with APCT. The AQ ability of students must be improved and improved to have strong psychological resilience. This highlights the importance of having good SRL and continuously improving it among final-year students, as it can help develop adversity skills, enabling them to find solutions to any academic challenges they face and reduce the tendency to procrastinate in completing their thesis. Thus, Hypothesis 2 is proven.

Table 4 Results of Regression Analysis on the Influence of Mediation by Adversity Quotient.

	Model I		Model II	
	Original Sample	P Value	Original Sample	P Value
X1 -> Y	-0,295	0,001	-0,497	0.000
X1 -> M			0,734	0.000
M -> Y			0,275	0,021
X1 -> M -> Y			0,202	0,023

To test the role of gender moderation in the relationship between SRL and APCT (hypothesis 3), we implemented moderation regression as presented in Model III in Table 5. The analysis results indicate that the interaction coefficient between SRL and APCT is not influenced by gender as a moderating variable. Similar to Model IV, we conducted a regression test without involving mediating variables and found that gender does not moderate the relationship between SRL and APCT. The role of gender, whether male or female, does not have a weakening or strengthening effect; in other words, the presence or absence of gender has the same effect on the relationship between SRL and APCT. Therefore, whether or not gender is included as a moderating variable yields the same results, leading to the rejection of Hypothesis 3.

At this stage, we conducted testing with moderation and mediation regression tests using the combined model developed by Edwards dan Lambert (2007) and adapted by Lu et al. (2024), This model integrates both mediation and moderation effects. The analysis results of model III indicate that the influence of the SRL variable has increased; however, a decrease in correlation occurs when AQ is used as a mediating variable, as the AQ ability of final-year students has a positive influence, both being affected by SRL and affecting APCT. In model IV, the same conclusion is reached when the mediating influence is removed. The role of gender is not proven, and the relationship between SRL and exerting a negative influence has decreased.



Table 5 Results of Regression Analysis on the Mediating Effect of Gender.

	Model III		Model IV	
	Original Sample	P Value	Original Sample	P Value
X1 -> Y	-0,517	0,001	-0,312	0,026
X1 -> M	0,734	0,000		
M -> Y	0,271	0,021		
X1 -> M -> Y	0,199	0,023		
G x X1 -> Y	0,036	0,429	0,028	0,447

4. Discussion

4.1. Self-regulated learning on academic procrastination in completing a thesis

The complexity of the issues faced by final-year students in completing their theses at universities often leads to pressure. The complexity of these problems, particularly in thesis completion at higher education institutions, is susceptible to stress (Djamahar et al., 2020), influenced by both internal and external factors (Subashkevych, 2023). SCT explains that individual behavior can be shaped by personal and environmental influences (Bandura, 1977). The behavior of procrastination in completing final assignments is a common issue often experienced by students (Waheed et al., 2021); thus effective interventions to enhance self-management skills and adversity intelligence are essential to minimize APCT.

Based on the theoretical framework and objectives of this research, it is first noted that the self-regulated learning (SRL) possessed by final-year students plays an important role in academic performance and critical thinking (APCT). Several previous studies by Amani (2020); de la Fuente et al. (2021); Filiz and Dogar (2021); Wilby (2022); and Zarrin et al. (2020) support this finding. Therefore, the ownership of SRL has an impact and is important to consider regarding the behavior of final-year students in fulfilling their academic obligations. Final-year students with high Self-Regulated Learning (SRL) will certainly have clear and measurable goal concepts, which will help minimize any behaviors that could lead to Academic Procrastination and Counterproductive Tasks (APCT) (de la Fuente et al., 2021). The better students are at organizing and planning, as well as being consistent with their goals, the greater their chances of persevering and overcoming obstacles or difficulties. Hapidoh et al. (2019), in their research, explain that self-regulation in students is demonstrated through planned, strategic, evaluative behaviors, the implementation of strategies, commitment, and the ability to organize to achieve goals. In students, the role of self-regulated learning (SRL) is significant in determining a clear direction and effective strategies (Teng & Zhang, 2020) as well as consistency. The results of this study illustrate the importance of external factors that influence the development of self-regulated learning (SRL) skills in students (Srivastava et al., 2022) particularly at the final stages of their education.

The research results show that students from the Economics Education Study Program at UNS and the Economics Education Cooperative Study Program at UNNES from the 2018-2019 cohort are striving to design their cognitive strategies to achieve academic goals. They demonstrate resilience in fulfilling academic obligations through strategies of understanding, modification, and analysis to overcome difficulties (Panadero, 2017). In addition, students also possess self-regulation skills in managing and controlling themselves regarding academic tasks. The arrangement is like the ability to persevere when facing difficulties in completing tasks or obstacles that hinder resolution (Pintrich & De Groot, 1990). Based on the measurement indicators, it can be observed that the self-regulated learning (SRL) efforts made by students are categorized as high, but they need to be continuously improved. This finding confirms that high Self-Regulated Learning (SRL) positively influences students' efforts in completing their theses (H1).

4.2. The role of adversity quotient as a mediator of the influence of self-regulated learning on academic procrastination in thesis completion

The research results indicate that the level of self-regulated learning (SRL) among students has a significant positive impact on their AQ. Fitrianingtyas et al. (2024) state that students with a high level of SRL will be able to manage themselves and have the willingness to take initiative without relying on others in their learning activities. Thus, with strong determination, if students encounter obstacles in their learning process, they will strive to turn challenges into opportunities to achieve success, which will positively affect the enhancement of their AQ abilities. Referring to Resilience Theory by Norman Garmezy 1973 (Luthar, 2003) the concept of AQ is related to the psychological resilience of individuals in facing challenges. Individuals with high adversity abilities supported by SRL skills will be a combination of psychological resilience in individuals to solve problems that occur with the best solutions and strategies. The role of the social environment, including family, friends, and lecturers, can provide positive encouragement so that learners are not only able to self-regulate effectively but also possess better adversity skills (Sabrillah et al., 2021).

Model II shows that AQ has a significant positive influence on APCT, and this finding complements the previous results from Ikbar et al. (2022) and Tuasikal et al. (2019). Various previous findings have shown that AQ plays an important role in suppressing AP behavior. It is believed that a higher AQ helps students cope with academic difficulties. Students with a good AQ will have a positive perception of difficulties and turn them into opportunities (Stoltz, 1997). Conversely, a negative perception can lead to procrastination in academic completion (Pollack & Herres, 2020). Moreover, the higher the students' ability to manage their AQ in terms of finding solutions to every problem they encounter while completing their thesis, the more it impacts the reduction of academic procrastination behavior (Kljajic & Gaudreau, 2018).

A high AQ among students also positively influences academic goal achievement (Jumareng & Setiawan, 2021) and learning outcomes (Mwivanda & Kingi, 2019). Thus, through efforts to strengthen AQ in the personalities of students, these efforts contribute positively to the research problem, namely the ability to minimize academic delays in the completion of theses by students. However, the results of this study indicate that the students of Economic Education at UNS and Cooperative Economic Education at UNNES from the 2018-2019 cohort have a positive influence. The ability to cope with adversity in students is influenced by various factors, one of which is family social support (Akbar et al., 2023). Family social support can have a positive influence on AP due to various conditions.

The role of parents or family, as well as the immediate environment, holds a significant position in shaping students' habits. This statement is in line with research findings from the early 1990s, which indicate that parenting styles, family expectations, and disagreement with students' desires can lower self-esteem, leading to AP behavior (Frost et al., 1991). Pychyl et al. (2002) provide evidence that female students raised in families with mothers who foster trust and self-esteem are better able to minimize procrastination than male students raised in families with paternal caregiving. In line with Zakeri et al. (2013) positive parenting styles that involve acceptance and the provision of psychological autonomy are significantly negatively correlated with procrastination, while strictly supervised parenting tends to increase procrastination attitudes. Therefore, it is suggested that families play a dynamic role, particularly close relatives, even if indirectly, to minimize the occurrence of higher levels of procrastination. This is because family patterns and support will impact the development of AQ skills in students as a form of personal cognitive ability that ultimately leads to procrastination behavior. Therefore, the importance of parenting styles, family support, and the right environment in shaping AQ from a positive perspective is crucial, as it can help students overcome obstacles with the right steps and not easily give up during difficult times before achieving success in completing their thesis.

Regarding the second hypothesis, the analysis results indicate that AQ significantly mediates the influence of SRL on APCT. AQ functions as a mediator that connects SRL with APCT, while also confirming the findings of Astri and Latifah (2018) which reveal the importance of mediation variables as a bridge to debate the results of previous research on the studied topic, one of which is AQ. AQ is a global predictor of success (Stoltz, 1997), and it is a strong predictor of SRL. The findings of this study indicate that the mediating role of AQ has a positive effect on the relationship between SRL and APCT. This means that students' ability to face difficulties can be enhanced and shaped by self-regulated learning (SRL) appropriately. An SRL designed through the application of inappropriate strategies will affect the final outcome. Both factors are formed from primary sources that are ingrained from an early age, in the form of parenting styles and excessively high demands, which will impact the habits formed regarding self-management and an individual's ability to face challenges (Frost et al., 1991). The first hypothesis has been proven to find a significant negative influence between SRL and APCT. However, when mediated by AQ, its value moves away from significance, indicating that its influence is decreasing. This is because the AQ ability developed in students is not yet fully categorized as good; negative perceptions tend to lead students to procrastinate in completing academic tasks (Pollack & Herres, 2020). As a result, students have not been able to overcome difficulties and turn them into opportunities, leading to an increase in APCT behavior. Therefore, the role of SRL in formulating strategies, steps, and objectives must be directed and rational, and it should prepare alternative strategies and a positive outlook when facing difficulties. Other researchers who found evidence regarding the role of AQ as a mediating variable for AP include Muarifah et al. (2022), who stated that the AP behavior exhibited by students in Magelang City, Central Java, is proven to be influenced when mediated by adversity quotients as students can overcome the difficulties they face.

4.3. The role of gender as a moderating factor in the influence of self-regulated learning on academic procrastination in thesis completion

The results of the moderation regression analysis for Hypothesis 3 (H3) indicate that gender does not have a moderating effect on the influence of SRL on APCT. It can be observed that in model III before we included the moderating variable of gender, SRL had a significant and negative effect on APCT. However, when moderated by gender, the relationship between the two variables showed a decrease in significance, and the coefficient value also declined. The research results on students of Economic Education/Cooperative Education at UNS and UNNES from the 2018-2019 cohort who have not yet completed their thesis show that there is no difference between male and female students in terms of the use of cognitive strategies and self-regulation in completing certain academic tasks for thesis completion. This means that both female and male students have the same ability to maintain self-management and cognitive strategies in completing academic work.

The findings of this study align with the research conducted by Veloo et al. (2015) which indicates that there is no significant difference between males and females regarding self-regulation or SRL in academic tasks. Research by Ebadi and Shakoorzadeh (2015) found that men and women have learning process skills in the form of cognitive and metacognitive strategies at the same level, but academic procrastination is influenced by the learning environment and motivation in them. In line with Noviani et al. (2023) although the number of respondents by gender shows that there are more female respondents than male respondents, the findings of that research also support the findings of this study, indicating no significant influence on the differences between males and females regarding SRL, which demonstrates similar characteristics on the testing indicators used. This indicates that gender is not a determining variable in the relationship between self-regulated learning (SRL) and academic performance (AP) in thesis completion.

5. Conclusion

This research investigates whether SRL affects AP's response to completing a thesis separately and then incorporates mediating and moderating predictors. To answer this question, we used a case study methodology, Moderated Path Analysis. The findings are summarized as follows: First, this research proves that final-year students with high self-regulated learning (SRL) abilities can have a significant negative impact on the decline of academic procrastination (AP) attitudes when completing their thesis. This is because these students possess self-management skills and can control themselves in academic tasks, allowing them to have clear and measurable goal concepts, which in turn suppresses all potential behaviors that could lead to AP in thesis completion. Second, the relationship between SRL has been shown to have a negative and significant impact on APCT, but when mediated or through the AQ variable, the value of its influence decreases while still indicating a correlation. Therefore, the importance of developing good self-regulated learning (SRL) skills in formulating goals is crucial, as it will impact behaviors that align with addressing the issues of this research. Then this study found that gender does not moderate or have a strong or weak influence on the relationship between SRL and APCT, meaning there is no difference in roles between men and women in this relationship.

The findings of this research provide empirical implications that the psychological conditions of final-year students during the thesis writing process will face challenges, leading to procrastination occurring frequently; however, this can be mitigated by introducing the roles of Self-Regulated Learning (SRL) and Academic Resilience (AQ). Furthermore, these findings can help provide insights for final-year students and all parties responsible for the phenomenon of Academic Procrastination as a graduation requirement in higher education, which also affects the quality of study programs or institutions regarding their accreditation status.

Although it has contributions, this research has several limitations that may require further investigation. First, this research only investigates students from the Economics Education Study Program at UNS and the Cooperative Economics Education Program at UNNES from the 2018-2019 cohort. Second, this research only involves variables derived from personal factors based on Bandura's SCT theory (1977), so there may be differences in the roles of personal factors and environmental factors in shaping student behavior. Third, this study only combines one mediating variable and one gender-moderating variable. Therefore, future research is expected to complement this study by investigating differences in regional origin and age, as well as other variables that may mediate or moderate this relationship. Future research could consider involving other factors and theories, such as the phenomenon of academic procrastination in thesis completion caused by depression and suicidal ideation, the involvement of environmental factors, and more complex research loci to explain why final-year students consciously engage in academic procrastination in their thesis completion.

Ethical Considerations

Ethical approval was granted by Dean of the Teacher Training and Education Faculty at Sebelas Maret Surakarta. Written informed consent was secured from all participants prior to the commencement of data collection.

Conflict of Interest

All authors declare that we have no conflicts of interest.

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