

Measuring tools to help professional teachers: Valid and reliable perfectionist academic scale tools for students

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ABSTRACT

Every student hopes to succeed academically, but some students tend towards academic perfectionism, which can impact conditions at school. Professional teachers need to detect these characteristics, but there are no specific measuring instruments for elementary and secondary school students. Therefore, this study aims to develop and test the validity and reliability of the academic perfectionist scale. This scale was developed based on five main aspects: not taking assignments as a burden, being disciplined and consistent, having high grades, being afraid of failure, and having negative views of others. The research method used is a mixed sequential exploration, which combines qualitative and quantitative approaches in stages. Scale arranged from a literature review validated by experts and then analyzed qualitatively. Then, there is an empirical test using confirmatory factor analysis (CFA) with 108 respondents from Indonesia and Pakistan. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA) results of 0.736 indicate that the data is sufficient for factor analysis. Of the 28 initial items, 24 have adequate validity with a loading factor value of ≥ 0.55 . The reliability test with Cronbach's Alpha produced a value of 0.718, indicating good internal consistency. This academic perfectionist scale is valid and reliable as a measuring tool for students' academic perfectionism tendencies, which apply to educational and counselling interventions. The novelty is that this measuring tool applies at the elementary school level, from grade 3 to high school students (teenagers). However, further research is needed to test the external validity of this scale on a broader population.

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1. Introduction

Students have the potential and competence in self-development in school and the world of life (Supriyanto, 2016; Sutoyo & Supriyanto, 2015). In developing students' potential and competence, the state has prepared a basic curriculum that is a reference for schools that impacts students' enjoyment of reading and learning (Whitten et al., 2019). The main goal of education is academic success in the role of teachers, families, and the social environment (Alyahyan & Düşteğör, 2020; Roksa & Kinsley, 2019). The social environment can be perceived in cyberspace and face-to-face worlds that support academic success with social networks, social capital, and social support with emotional regulation and learning regulation in students (Gueldner et al., 2020; Mishra, 2020).

Academic success in school is one of the factors based on personality. It is proven that there are problems for students at the elementary and secondary education levels academically, socially, personally, and careerly (Supriyanto et al., 2022). Academically successful students usually have a

perfectionist spirit. Perfectionism is a continuous desire to obtain the best mental, physical, spiritual, and material qualities compared to others to achieve a perfect or as good life as possible (Kumar, 2020). Academic perfectionism will be critical of oneself with three sub-indicators of scholarly criticism, doubts about the actions taken, and academic perfectionism towards friends/socially (Liu & Berzenski, 2022), but it turns out that perfectionist individuals have an impact on psychological fatigue (mental, psychological, and physical) (Seong et al., 2021; Supriyanto et al., 2024).

Perfectionist individuals expect to have academic achievement. Still, it turns out that students' perfectionist efforts show a positive but small to moderate relationship significant to educational achievement (Madigan, 2019). Another fact is that perfectionist students positively impact psychological well-being but may negatively impact academic achievement (Fernández-García et al., 2022). These facts raise a gap in academic perfectionism. However, there is a positive relationship between perfectionist efforts and educational attainment; the correlation is relatively small to moderate, and perfectionism can also hurt psychological exhaustion. Others show that perfectionism can be influenced by contextual factors such as cultural differences and education systems in various countries.

The condition of academic perfectionist students requires a valid measuring instrument from the construct, content, and criteria (Clark & Watson, 2019). In addition to the measuring instrument being valid, it is also reliable because the academic perfectionism of students must be an accurate measuring instrument (Sürücü & Maslakci, 2020). So, academic perfectionism needs to be developed in terms of detection and mitigation for professional teachers. Professional teachers must be able to detect and prevent conditions outside of students' academic perfectionism that aren't desired. From the theoretical study, there are five indicators of students who are academic perfectionists, namely not making assignments a burden, being disciplined and consistent, having high grades, being afraid of failure, and having negative views of others (Fang & Sotardi, 2023).

This study aims to develop a valid and reliable scale for identifying academic perfectionism in students. Developing an academic perfectionism scale ensures accuracy in detecting and understanding its characteristics (Liu & Berzenski, 2022) compared to other instruments because it only measures each level of education. Because academic perfectionism occurs when students and college student's study at school or college. In addition, this study has an impact on providing insight for professional teachers in detecting and managing the impact of academic perfectionism so that they can prevent potential adverse effects that may arise. Thus, the results of this study are expected to contribute to the development of effective mitigation strategies in supporting students' psychological and academic well-being.

2. Method

2.1. Research design

This study used a sequential exploratory mixed method that integrated qualitative and quantitative approaches in stages to develop an academic perfectionist scale. This method begins with conceptual exploration through a literature review to identify the main aspects of academic perfectionism with five indicators of students who are academic perfectionists, namely not making assignments a burden, being disciplined and consistent, having high grades, being afraid of failure, and negative views of others (Fang & Sotardi, 2023). Furthermore, the five indicators as qualitative data were used as the basis for compiling academic perfectionist scale items, which were then validated by a panel of experts through an evaluation of conceptual suitability and language clarity. After revision based on expert input, the scale was tested quantitatively with confirmatory factor analysis (CFA) to confirm the measurement model of the academic perfectionist scale. Reliability testing was carried out using Cronbach's Alpha to ensure the internal consistency of the student's academic perfectionist scale. With this approach, the study aims to produce an academic perfectionist scale instrument with high validity and reliability that can be applied in various research contexts, educational psychology practices, and practices for professional teachers.

2.2. Data collection tools and process

The first stage of this study focused on compiling the academic perfectionist scale grid based on a comprehensive review of scientific literature, both from journals and relevant academic books. From the results of this study, 28 statement items were compiled that were explicitly designed

according to the characteristics of the target users of the scale. In the second stage, to ensure conceptual accuracy and accuracy of item formulation, content validation was carried out through an assessment by an instrument expert. The experts evaluated the blueprint and the clarity and relevance of each statement item to provide input for improvement. This process aims to test content validity, including logical and face validity, to ensure that the scale meets high conceptual and methodological standards before further testing.

At this stage, expert input is reviewed and evaluated. The academic perfectionist scale requires suggestions and criticisms from experts to refine the grid or 28 items of the academic perfectionist scale statements as qualitative data. In addition to suggestions and input, the researcher measured the level of agreement in the instrument trial to reveal the level of content validity as quantitative data. The third stage is to determine the validity and reliability of the academic perfectionist scale construct through confirmatory factor analysis (CFA; N = 108). N = 108 were given 28 statement items from the academic perfectionism scale design with four response options from the Linkert scale (4- very much agree, three agree, 2- not agree, and 1- very much not agree). The goal was to find valid statements and a reliable academic perfectionism scale.

2.3. Participants

The first participant was an expert instrument validator who was a teacher and was accustomed to researching psychology. The expert validator in psychology was a professor at Universitas Ahmad Dahlan. The validator looked at the perfectionist academic scale grid and item statements, providing input and suggestions as qualitative data. Furthermore, the researcher conducted a trial on N=108 adolescents/individuals/students at elementary and secondary school levels (junior high school, vocational high school, and high school) in Indonesia and Pakistan at random sampling so that it was analyzed using the CFA statistical test. The sampling of the instrument trial was carried out randomly. The sample consisted of 99 girls and nine boys. The age of the research sample was 10-17 years.

2.4. Data analysis

This study uses qualitative descriptive analysis, including data reduction, data presentation, and conclusion drawing, to identify the basic concept of academic perfectionism and compile the right grid (Miles & Huberman, 1994). The content validity of the validator is analyzed qualitatively. Then, logic validity is used in the interrater method to see the students' agreement and measure the level of agreement on the relevance of the statement items. Furthermore, the validity of the statement items and the reliability of the academic perfectionist scale are tested through Confirmatory Factor Analysis (CFA) (Schreiber et al., 2006) involving 108 participants (N = 108). Data analysis was carried out using SPSS software for the primary statistical test, while additional calculations were carried out with Microsoft Excel to ensure accuracy in data processing.

3. Results and Discussion

This study identified five sub-aspects in the academic perfectionist concept based on the idea of Fang and Sotardi (2023), with five of them rooted in the indicators of 5 indicators of academic perfectionist students, namely not making assignments a burden, being disciplined and consistent, having high grades, being afraid of failure, and negative views of others. These sub-aspects are internalized in the personal realm by preparing an academic perfectionist scale grid, as shown in Table 1. The results of this study produced 28 statements, consisting of 14 positive statements (favorable/f) and 14 negative statements (unfavorable/un-f).

Table 1. Initial grid of the academic perfectionist scale instrument

Variable	Aspect	Favorable (+)	Unfavorable (-)
Academic perfectionist	Not making assignments a burden	3	3
	Discipline and consistency	5	5
	Having high values	3	3
	Afraid of failure	2	2
	Others' negative views of academic perfectionists	2	2

After compiling the statement items, the instrument expert validator, a psychologist, validated the academic perfectionist scale. In this process, the validator provided notes that were then analyzed qualitatively to ensure the quality and clarity of the statement items. The analysis showed that the statements needed to focus on operational sentence construction, avoiding ambiguity through language paraphrasing and re-examining so that all items remained relevant for elementary and secondary school levels. More detailed qualitative test results regarding content validity based on input from the validator can be seen in Table 2.

Table 2. Notes on improvements in the results of the content validation test (face validity) on the academic perfectionist scale

Validator (initial)	Notes
AM	<ol style="list-style-type: none"> 1. Statements need to be focused on operational sentence construction 2. Avoid ambiguity through paraphrasing 3. Recheck so that all items remain relevant for elementary and secondary school levels

After the qualitative process, the researcher tested the academic perfectionist scale on N = 108 students. The study's results obtained data agreement that the intraclass correlation coefficient value with an average Cohen's Kappa value of 0.511 or a moderate category was suitable for use in measurement (Belur et al., 2021; McHugh, 2012). The results of the feasibility analysis in the logical validity of the academic perfectionist scale can be seen in Table 3.

Table 3. Intraclass correlation coefficient

	Intraclass correlation	95% confidence interval		F test with true value 0			
		Lower bound	Upper bound	Value	df1	df2	Sig
Single measures	0.036a	0.020	0.058	2.046	107	2889	0.000
Average measures	0.511c	0.368	0.635	2.046	107	2889	0.000

After conducting a quantitative analysis using the intraclass correlation coefficient as a form of logical validity, the researcher conducted a trial of the instrument on 108 students from elementary and secondary schools in Indonesia and Pakistan. The results of the analysis of 28 statements showed that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA) reached 0.736, which is greater than the minimum limit of 0.50 so that the factor analysis can be continued by examining the anti-image correlation value. This finding indicates that the KMO MSA value of 0.736 with a significance level of $0.000 \leq 0.05$ is in the adequate category (range 0.7–0.79) to measure students' academic perfectionism so that the instrument can be processed to the following analysis stage (Shrestha, 2021). Table 4 describes the analysis of KMO MSA.

Table 4. Kaiser-Meyer-Olkin and Bartlett's test of the academic perfectionism scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.736
Bartlett's Test of Sphericity	Approx. Chi-Square	603.138
	Df	68
	Sig.	0.000

In addition, the KMO value shown in Table 4 also shows a result of ≥ 0.5 . Then, in the 28 statement items in Table 5, the anti-image correlation score is in the range of 0.485–0.935, so 2 statement items don't meet the Sampling Adequacy Measure criteria (Shrestha, 2021) and are declared invalid. Furthermore, the trial results with N = 108 showed that the loading factor value was ≥ 0.55 , indicating that each item has adequate validity. The loading factor range for the twelve items ranged from 0.390–0.884, confirming that the 24 statements in the academic perfectionist scale have met the validity standards and are a valid measuring tool in evaluating students' academic perfectionism level. Meanwhile, four scale items with two statement items on the high-value indicator, 1 statement item on the fear of failure indicator, and 1 statement item on the academic perfectionism stigma indicator were declared invalid. Table 5 describes the analysis of the validity of the academic perfectionism scale.

Table 5. The validity of the academic perfectionism scale

Coding aspect	Statement	Indicator	Anti-image correlation	Factor loading	Valid/invalid
TC1	Feeling empty when there isn't homework	Task as a challenge	0.932	0.862	Valid
TC2	Fear of experiencing a decrease in grades	Task as a challenge	0.716	0.607	Valid
TC3	Feeling stressed if you don't take the time to study	Task as a challenge	0.759	0.648	Valid
TC4	I am happy when teachers/lecturers give assignments	Task as a challenge	0.701	0.604	Valid
TC5	Forgetting time to do other assignments	Task as a challenge	0.648	0.570	Valid
TC6	Having a daily schedule for doing assignments	Task as a challenge	0.935	0.884	Valid
DC7	Putting up a planner board to record existing assignments	Discipline and consistency	0.642	0.559	Valid
DC8	Doing assignments as you please	Discipline and consistency	0.719	0.666	Valid
DC9	I do care about lecturers when giving assignments, so I don't record and know the assignments given	Discipline and consistency	0.787	0.690	Valid
DC10	Having your deadline for doing assignments	Discipline and consistency	0.792	0.689	Valid
DC11	Doing assignments long before the deadline	Discipline and consistency	0.777	0.682	Valid
DC12	Forgetting about assignment deadlines because of other assignments	Discipline and consistency	0.825	0.719	Valid
DC13	Doing assignments close to submission	Discipline and consistency	0.767	0.667	Valid
DC14	Asking friends about assignments when you feel you have difficulty	Discipline and consistency	0.781	0.682	Valid
HV15	Anxious when you don't get an answer	High value	0.826	0.712	Valid
HV16	Targeting high grades in every subject	High value	0.927	0.827	Valid
HV17	Feeling you have to have perfect grades in every subject/course	High value	0.762	0.692	Valid
HV18	Accepting grades even though they don't reach the existing target	High value	0.905	0.819	Valid
HV19	Becoming excessive in criticizing yourself	High value	0.569	0.491	Invalid
HV20	Having demands from parents	High value	0.485	0.390	Invalid
FF21	Experiencing depression due to existing demands	Fear of failure	0.801	0.734	Valid
FF22	Must achieve desired goals	Fear of failure	0.719	0.627	Valid
FF23	Too ambitious so that you put aside other things	Fear of failure	0.710	0.628	Valid
FF24	Showing achievements to others who have a negative view of yourself	Fear of failure	0.491	0.398	Invalid
APS25	Showing achievements as proof of success	Academic perfectionism stigma	0.566	0.552	Valid
APS26	Afraid of other people's views when't doing their best in doing a task	Academic perfectionism stigma	0.839	0.722	Valid
APS27	Uncomfortable with other people's views when getting maximum results	Academic perfectionism stigma	0.542	0.484	Invalid
APS28	Feeling empty when there isn't homework	Academic perfectionism stigma	0.755	0.673	Valid

After testing the validity of each statement item that meets the criteria, the researcher continued with the reliability test analysis. The test results showed that Cronbach's Alpha value reached 0.718, which is more significant than the minimum limit of 0.70, which is included in the

high category, as shown in Table 6. The instrument is said to be reliable or has good consistency if the Cronbach's Alpha value exceeds 0.70 (Shrestha, 2021).

Table 6. Results of reliability analysis of the academic perfectionist scale instrument

Cronbach's Alpha	N of items
0.718	28

CFA analysis with detailed series to obtain a perfectionist academic scale that can measure the academic conditions of perfectionists in elementary and high school students. So that it can detect students who have perfectionist psychology in academic matters, from 28 items, it can be seen that it has been stated as valid and reliable in 24 statement items with indicators of not making assignments a burden, being disciplined and consistent, having high grades, being afraid of failure, and having negative views of others. Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA) of 0.736 \geq 0.50. The anti-image correlation value in 24 valid statement items is 0.552–0.884 \geq 0.50. Finally, based on the Loading Factor value in the 24 items, it is stated with a score range between 0.548–0.770 \geq 0.55. The results of the reliability test analysis obtained a Cronbach's Alpha value of 0.718 \geq 0.7 with a high category. Overall, the data shows that the academic perfectionist scale with 24 statement items is declared valid and reliable to meet the research objectives, namely analyzing the validity and reliability of the academic perfectionist scale in elementary and high school students. The following is the final grid of the academic perfectionist scale instrument in Table 7.

Table 7. Final grid of the academic perfectionist scale instrument

Variable	Statement	
	Aspect	Favorable (+) Unfavorable (-)
Academic perfectionist	Not making assignments a burden	3 3
	Discipline and consistency	5 5
	Having high values	1 3
	Afraid of failure	2 1
	Others' negative views of academic perfectionists	2 1

This study aims to develop an academic perfectionist scale by testing its validity and reliability. Thus, the academic perfectionism scale can measure the tendency of academic perfectionism in elementary and secondary school students as a novelty because not all instruments can measure at different levels. The results of this study provide a deeper understanding of the construction of academic perfectionists based on five leading indicators: not making assignments a burden, being disciplined and consistent, having high grades, being afraid of failure, and negative views of others towards academic perfectionists.

A validity test conducted using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA) showed a value of 0.736, which is adequate for factor analysis. These results indicate that the academic perfectionist scale has a pretty good level of sample suitability (D'Agostino, 2017). In addition, the reliability test with Cronbach's Alpha of 0.718 shows that the instrument has high internal consistency and can be relied on as a measuring tool. Of the 28 statement items tested, 24 met the validity criteria, while four were declared invalid because they didn't reach the minimum value in the validity test. Invalid items consisted of two items in the indicator having a high value, one in the fear of failure indicator and one in the indicator of negative views of others towards academic perfectionists. This shows that not all statements in the scale can measure the expected aspects consistently (Likert, 2017).

The measurement results show that five leading indicators can identify academic perfectionism in students. Previous studies state that academic perfectionism isn't only related to high academic achievement but also involves psychological aspects such as fear of failure and social perceptions of academic achievement. In this context, indicators of discipline, consistency, and not making tasks a burden have higher validity than other indicators. This shows that students with a tendency towards academic perfectionism are likelier to show organized behaviour and have strong intrinsic motivation in completing tasks (Madigan, 2019). Conversely, the indicator of negative views of others towards academic perfectionism has a lower level of validity, which may be caused by

differences in students' perceptions of social pressure in the student's academic environment (Wang & Degol, 2016).

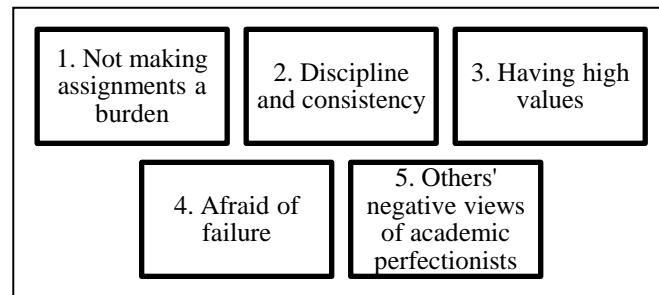


Fig. 1. Five indicators of academic perfectionism

The results of this study have broad implications in the fields of educational psychology and academic intervention. Teachers, counsellors, and researchers can use the academic counsellor's sanism scale to identify those with excessive academic perfectionism tendencies. With a better understanding of academic perfectionism, more appropriate interventions can be designed to help students develop healthier learning strategies and reduce the negative impacts of perfectionism, such as academic anxiety and stress (Flett et al., 2016; Osenk et al., 2020). In addition, this scale can also be used in further research to explore the relationship between academic perfectionism and other psychological factors, such as emotional well-being, learning motivation, and coping strategies in dealing with academic pressure (Collin et al., 2020; Kurtovic et al., 2019; Rice et al., 2016). This study contributes to understanding how academic perfectionism can affect students' learning process and academic achievement (Damian et al., 2017; Lee & Anderman, 2020; Madigan, 2019).

Although the results of this study indicate that the academic perfectionism scale has good validity and reliability, several limitations need to be considered from the limited number of samples in students in Indonesia and Pakistan, so further research is needed with a broader sample coverage to test the external validity of this scale. This instrument measures academic perfectionism in the context of formal education, so it doesn't consider external factors such as family influences and educational culture in the student's environment. Further analysis, such as Confirmatory Factor Analysis (CFA), is needed to test a more complex scale model and confirm the resulting factor structure (Prudon, 2015) in this study. As a next step, further research can be conducted by testing this scale on groups of students with different cultural backgrounds (Brown, 2015; Perry et al., 2015), as well as exploring the relationship between academic perfectionism and other psychological variables, such as academic stress, burnout, and learning motivation by professional teachers.

Professional teachers have a strategic role in understanding and managing academic perfectionism tendencies in students. As educators with pedagogical, professional, social, and personality competencies, teachers are responsible for transferring knowledge and shaping students' character and psychological well-being (Kumar, 2020). In academic perfectionism, a professional teacher must be sensitive in recognizing students who show excessive perfectionist tendencies, such as fear of failure, pressure to achieve high grades, and prolonged academic stress. With a deep understanding of these psychological aspects, teachers can create a more conducive learning environment and support student development in a balanced and enjoyable way (Hartini et al., 2023).

In the learning process, professional teachers can apply a more humanistic and student-centred approach so that they don't just focus on academic results but also understand the enjoyable learning process as part of personal development (Moningka et al., 2024). One strategy that can be applied is providing constructive feedback, which assesses academic achievement and emphasizes students' efforts, creativity, and perseverance in learning (Brandt, 2020). In addition, teachers can help students develop a growth mindset so that they don't consider mistakes as absolute failures but as part of the learning process (Dweck & Yeager, 2020; Yeager & Dweck, 2020). Thus, students will be braver in facing academic challenges without being overshadowed by excessive fear of failure.

In addition to pedagogical aspects, professional teachers must collaborate with school counsellors to provide appropriate interventions (Supriyanto, 2016) for students who experience the negative impacts of academic perfectionism. Using an academic perfectionist scale in the initial

assessment can help teachers identify students vulnerable to excessive academic pressure. With the data obtained from this scale, teachers can adjust learning strategies that are more flexible and responsive to students' individual needs (Killen & O'Toole, 2023). Collaboration between teachers and counsellors also allows more intensive assistance for students who need guidance in managing academic stress and developing healthier learning strategies (Myrick, 1987). Furthermore, professional teachers also play a role in instilling the values of balance between academic achievement and emotional well-being (Kaya & Erdem, 2021). In an increasingly competitive world of education, students often feel trapped in the pressure always to achieve perfect results. Therefore, teachers must become agents of change who can foster a healthier academic culture where success is measured by numbers and rankings and by the development of students' skills, creativity, and character.

4. Conclusion

This study aims to develop a valid and reliable scale to identify academic perfectionism in elementary and secondary school students. Through a quantitative approach and expert validation, this scale was developed based on five indicators of academic perfectionism: not making assignments a burden, being disciplined and consistent, having high grades, being afraid of failure, and negative views of others towards academic perfectionists. The results showed that out of 28 statements tested, 24 were declared valid and reliable, while four statements didn't meet the validity criteria. The validity test using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA) produced a value of 0.736, which is in the adequate category (≥ 0.50), and the reliability test with Cronbach's Alpha of 0.718 showed that this scale has high internal consistency. Overall, this Academic Perfectionist Scale is a test as valid and reliable as an instrument that can measure the level of academic perfectionism in elementary and secondary school students. Thus, this scale may be helpful in educational psychology research and develop interventions for students with academic perfectionism tendencies.

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Declarations

- Author contribution** : The researcher contributed to all stages of the research, including conceptual design, data collection and analysis, and drafting and revising the manuscript.
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