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The scale of sincerity based on Kyai Haji Ahmad Dahlan's version for Islamic students: the Rasch analysis

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ABSTRACT

The students are urged to do something without expecting anything in return and only in the name of God. Every Islamic student becomes something ideal if they can internalize and implement sincerity. Many people are willing to do something because of an ulterior motive. The importance of sincerity in humans is the background for developing a sincerity scale that measures personal sincerity. One of the figures who gave an example of sincere behavior was Kyai Haji (KH) Ahmad Dahlan, so the sincerity scale was adjusted to the character's sincere behavior. This scale consists of four indicators: having transcendental motives, the ability to control emotions, the absence of a sense of superiority, and being a servant of God. Two experts in Islamic psychometry tested KH Ahmad Dahlan's version of the sincerity scale. Besides that, construct validity involved 252 students. We employed Cohen's Kappa inter-rater reliability (IRR) coefficient and Rasch analysis as data analysis methods. The findings from Cohen's Kappa indicate that both experts concurred on the accuracy of the instrument's statement item. Additionally, the Rasch analysis reveals that the sincerity scale, based on KH Ahmad Dahlan's version, is reliable, accurate, and fits well with the model.

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1. INTRODUCTION

Every religion teaches about sincerity. Islam, the religion with the most adherents in Indonesia, also teaches sincerity [1]–[3]. Modern society applies sincerity when interacting with their social environment in modern society [4]–[7]. Several studies report that sincerity is an aspect of human personality that correlates with psychological well-being and personal emotional management [8], [9]. Teenagers also think that sincerity is an essential characteristic of social success compared to other characteristics [10]. In Indonesia, sincerity is a character that reflects the figure of Kyai Haji (KH) Ahmad Dahlan, especially in the theological concept of Al-Maun [11]–[13]. KH Ahmad Dahlan is a great cleric with the title of national hero of

Indonesia who is the founder of Muhammadiyah. The reflection of the sincere attitude of KH Ahmad Dahlan is the background of this research, which seeks to develop and validate the sincerity scale according to KH Ahmad Dahlan's version.

Research on sincerity in educational settings in schools has highlighted the importance of a culture of honesty, authenticity, and integrity. There is a need for a strong school system and clear stages in implementing a culture of honesty [14]. The further the role of teachers in shaping students' character in habituating honest or sincerity attitudes and behavior [15]. These studies collectively underscore the importance of sincerity in education and provide practical strategies for its implementation. So, it is necessary to develop a valid and reliable instrument related to sincerity. In this research, specifically the development of a sincerity scale instrument based on KH Ahmad Dahlan.

Only a few studies have produced a sincerity scale measuring human sincerity. One of the studies that specifically developed the sincerity scale showed that the sincerity scale consisted of ten items in two aspects, namely sincere social interactions and sincere emotional responses [16]. Another study produced a sincere scale comprising 22 statement items: having transcendental motives, the ability to control emotions, the absence of a sense of superiority, and being a servant of God [17], [18]. Unfortunately, the sincerity scale has not been used explicitly for Islamic students in Indonesia. This research relates to the sincere behavior of KH Ahmad Dahlan, who is close to Islamic figures in Indonesia. The form of sincerity from the figure KH Ahmad Dahlan is the concept of compassion based on the theology of Surah Al-Maun [19], [20]. The theology of Al-Maun's letter deeply means defending people experiencing poverty [21], [22]. The weakness of the sincerity scale in this study lies in the procedure and analysis of the instrument, which solves the limitations of previous research using Rasch analysis. The strength of Rasch's analysis is its ability to perform a complex and complete data analysis [23]–[25]. Rasch analysis can also produce instruments that have good reliability [26].

Instrument analysis using the Rasch model can increase calculation accuracy, because this analysis produces standard error values [27]. Several studies on the efficacy of Rasch model analysis are used in analyzing test instruments [28]. This research investigates validity using Rasch model analysis and tests the level of reliability of the instrument adapted from the KH Ahmad Dahlan perspective construct.

The research, which aims to produce a sincerity scale based on KH Ahmad Dahlan's version, uses four leading indicators. The indicators in question are having transcendental motives, the ability to control emotions, the absence of a sense of superiority, and being a servant of God [17], [18]. Individual problems in the context of sincerity, such as not accepting oneself, being unhappy, low psychological well-being, and loss of hope, are a manifestation of the need for a sincerity scale instrument [8], [29], [30]. The research results in a sincerity scale based on KH Ahmad Dahlan's version can be an instrument for photographing the level of personal sincerity. Data on the level of individual sincerity forms the basis for compiling guidance and counseling content containing the teachings of KH Ahmad Dahlan's sincerity.

2. METHOD

2.1. Research design

This research focuses on creating and validating an instrument to measure sincerity according to KH Ahmad Dahlan's perspective. The tool evaluates four key dimensions: transcendental motives, emotional regulation, humility, and devotion to God. The goal is to validate the sincerity scale through Rasch analysis, which provides insights into item fit, difficulty level, discrimination power, and item information function. Rasch analysis is particularly effective in delivering precise statistical data. Moreover, it offers comprehensive details on the sincerity scale's reliability, ensuring it meets the standards of a trustworthy measurement tool.

2.2. Participants

The participants in this study were 252 students from Muhammadiyah Vocational High School in Yogyakarta. They were chosen using the cluster random sampling method. Details about the selected participants are presented in Table 1.

Table 1. Research subjects

No	Location	N
1	Vocational High School Muhammadiyah 1 Yogyakarta	62
2	Vocational High School Muhammadiyah 2 Yogyakarta	39
3	Vocational High School Muhammadiyah 3 Yogyakarta	98
4	Vocational High School Muhammadiyah 4 Yogyakarta	53
Total		252

2.3. Data collection tools

The sincerity scale based on KH Ahmad Dahlan's version was validated in this study using Rasch analysis. The validated instrument includes four leading indicators: metacognition, cognition, motivation, and behavior. Table 2 describes the draft sincerity scale based on KH Ahmad Dahlan's version before the validation.

Table 2. Blueprint of sincerity scale based on KH Ahmad Dahlan's version

Indicator	Statement items	
	Favorable	Unfavorable
Has transcendental motives	– The purpose of my life is to worship God (1) – I don't expect other people to praise my goodness (2)	– I reject the advantages possessed by others (7)
Have the ability to control emotions	– I refuse to engage in behavior that is forbidden by God (8) – I respect the opinions of others who differ from mine (9)	– I am disappointed when others ignore my strengths (3)
Absence of feelings of superiority	– I hide the good things I have done (4) – I still do good things even though others don't acknowledge them (5)	– I want all my desires to be fulfilled (10)
Become a servant of God	– I believe in God (11) – I exhibit behavior that draws me closer to God (12)	– I ignored God's commands and prohibitions (6)

2.4. Data collection

A series of scientific steps were undertaken to develop a reliable tool for measuring students' sincerity according to KH Ahmad Dahlan's perspective. Initially, the variables to be measured, specifically sincerity, were identified based on KH Ahmad Dahlan's version. Next, we conducted a literature review, created the instrument framework, formulated the statement items, and had experts evaluate these items. In the third stage, an instrument trial was carried out with students completing the survey through Google Forms. Following this, we screened the data to determine which entries would be used. Lastly, data analysis was performed using Cohen's Kappa IRR coefficient to assess expert agreement on the validity of the statement items. Rasch analysis was used to examine item fit, focusing on how well they measured cultural intelligence among students in the context of social media.

2.5. Data analysis

The consensus of Islamic psychometric experts on KH Ahmad Dahlan's sincerity scale was assessed using Cohen's Kappa IRR coefficient. Additionally, the Rasch model was employed in this study with the support of Winstep software. The Rasch model allows for the simultaneous analysis of interactions between individuals and items. This approach relies on two key principles: the individual's ability or agreement level and the difficulty level of the items. The psychometric analysis tools used to evaluate the data included summary statistics, which assessed respondent quality, instrument quality, and person-item interactions. The development and validation of the instrument provided insights into item measures (the most and least difficult items for respondents to agree with), item fit (evaluating item appropriateness), and unidimensionality (ensuring the instrument measures what it is intended to measure).

3. RESULTS AND DISCUSSION

This section provides an analysis of the data concerning the content and construct validity of the sincerity scale as developed by KH Ahmad Dahlan. Two Islamic psychometric experts reviewed and agreed on the instrument's statement items for content validity. The inter-rater reliability (IRR) analysis using Cohen's Kappa coefficient yielded a value of $K = 0.583$, indicating good reliability. Additionally, the asymptotic standard error was calculated at 0.262. A lower value for this coefficient suggests greater reliability in the measurement results. Refer to Table 3 for more details.

Table 3. Content validity by the IRR coefficient of Cohen's Kappa

		Value	Asymptotic standard error
Measure of agreement	Kappa	0.583	0.262
	N of valid cases	10	

Rasch analysis is used to assess construct validity by evaluating i) the respondents' performance, the instrument's effectiveness, and the interaction between individuals and test items, ii) the most challenging

and easiest items for respondents to agree with, iii) the fit or misfit of items, iv) the instrument's ability to measure its intended construct, and v) the distribution of respondents and items on the person-item map. This process helps establish the reliability of the instrument in measuring students' sincerity levels.

Table 4 provides an explanation related to the description of summary statistics. Data was obtained through Rasch analysis with the Winsteps application. In summary statistics, it provides a comprehensive and comprehensive description of the respondents' quality of the instrument and the interaction between the person and item. According to the analysis of the summary statistics presented, the person measure reflects the respondents' average score on the sincerity scale. As shown in the table, the logit value for the person measure is +1.03. Based on the Rasch model guidelines, if the person measure exceeds a logit of 0.0, it indicates that respondents in this study are more likely to agree with the statements across various items.

Table 4. Description summary statistics

No	Information	Coefficient
1	The person measure	+1.03
2	Cronbach's alpha	0.52
3	Person reliability	0.47
4	Item reliability	0.98
5	Raw variance explained by measure	29.8%
6	unexplained variance	6.1%-12.8%
7	MEAN	1.02
8	S.D.	0.23

Cronbach's alpha is used to assess reliability, specifically the interaction between individuals and items overall. As shown in the Table 4, the Cronbach's alpha value is 0.52. According to the Rasch model's criteria for Cronbach's alpha, this score falls within the "fairly good" range, which is between 0.5 and 0.6. Person reliability reflects the consistency of responses from participants. From Figure 1, the person reliability value is 0.47. Based on the Rasch model's criteria for person reliability, this score is categorized as weak, as it is below 0.67. This indicates that respondents need to provide more consistent answers to the sincerity instrument. The reliability of the items reflects the overall quality of the instrument used. As seen in the image above, the item reliability score is 0.98. According to the Rasch model's reliability criteria, a score above 0.94 falls within a specific category, indicating that the items used in this instrument are of outstanding quality.

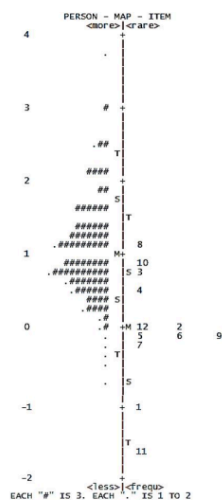


Figure 1. Variable maps

The scale of sincerity based on Kyai Haji Ahmad Dahlan's version for ... (Wahyu Nanda Eka Saputra)

Unidimensionality assesses whether the instrument effectively measures the intended construct, which in this case is sincerity. According to Table 4, the raw variance explained by the measurement tool in this study is 29.8%. This satisfies the unidimensionality criterion, which requires a minimum of 20%. A value exceeding 40% would indicate stronger unidimensionality, while a value over 60% would be considered exceptional. Additionally, the unexplained variance ranges between 6.1% and 12.8%, meeting the requirement that unexplained variance should not exceed 15%. Therefore, the instrument employed in this research successfully measures the intended construct.

Table 5 offers a detailed analysis of the item measurements, shedding light on which items respondents found most difficult and which were easiest to agree upon. This section not only categorizes items based on their complexity but also evaluates their overall alignment with the model, identifying which items fit well and which may deviate from the expected patterns. Such information is critical for refining item design and ensuring that the measures accurately capture the intended data.

Table 5. Item measure and item fit order

Item number	Coefficient of MEASURE	Coefficient of INFIT MNSQ	Annotation
8	+1.14	1.40	Misfit
6	+0.87	1.34	Misfit
11	+0.73	1.31	Fit
10	+0.51	1.17	Fit
3	+0.05	1.07	Fit
1	-0.05	1.01	Fit
4	-0.10	0.90	Fit
12	-0.10	0.91	Fit
2	-0.16	0.91	Fit
7	-0.30	0.89	Fit
5	-1.03	0.71	Fit
9	-1.56	0.66	Fit

Table 5 of the Rasch analysis highlights the varying levels of difficulty for respondents in agreeing on specific items. The first part of the table focuses on the most detailed and complex items. Based on the Item Measure analysis, item 8, with a logit value of +1.14, is identified as the most challenging for respondents to agree with, likely requiring more cognitive effort or personal reflection. On the other hand, item 11, with a logit value of -1.56, is the easiest for respondents to agree on, indicating a stronger alignment with their perspectives or experiences. This contrast between item difficulties provides valuable insights into how respondents interact with the items and the complexity of their content.

In the second part of the analysis, Table 5 outlines the Rasch model and addresses the item fit order evaluation. This helps identify which items are fitting properly and which are misfits. The method involves summing the MEAN and S.D. values and then comparing them to the MNSQ INFIT values. If the logit value surpasses the sum of the MEAN and S.D., it indicates an item is a misfit. Table 4 shows that the optimal logit value is 1.25, derived from $1.02 + 0.23$. As a result, three items item 8 with +1.40, item 6 with +1.34, and item 11 with +1.31 are identified as misfits due to their higher MNSQ INFIT values.

The analysis shown in Figure 1 illustrates the outcomes of the variable map. This part highlights the distribution of respondents' ability levels and the difficulty of the items. The variable map is a key component of Rasch analysis, performed using steps software.

On the left side, we see the distribution of respondents' abilities, while on the right side, the distribution of item difficulty levels is displayed. According to the map in Figure 1, the majority of respondents have logit values above the average (logit 0), indicating that, overall, they can answer the instrument items well. The most difficult item is item 8, with a logit value of +1.14, positioned at the top. Theoretically, this is the hardest item for respondents to agree with. Conversely, item 11, with a logit value of -1.56, is at the bottom, representing the easiest item for respondents to agree with.

The study results show that KH Ahmad Dahlan's version of the sincerity scale is a good instrument for measuring the level of sincerity of students, especially Islamic students. This instrument is a good assessment tool, especially as a basis for preparing guidance and counseling programs, especially in increasing sincerity. KH Ahmad Dahlan became one of the local wisdom appointed on the grounds of being a solid figure in Islam and the founder of an Islamic organization in Indonesia, namely Muhammadiyah [31]–[33]. Another reason is that there is a difference in the principle of sincere application of Islamic students in Indonesia to other countries outside Indonesia.

Ahmad Dahlan became a figure synonymous with sincerity in his da'wah activities. Previous research stated that sincerity is one of the values and attributes possessed by KH Ahmad Dahlan [34]–[36].

KH Ahmad Dahlan also places sincerity as a positive character that muslim students in Indonesia must possess [37]. Sincerity in Islam is defined as any action taken because the intention of worship is only for Allah SWT [38]. Sincerity as a positive character in humans correlates with self-acceptance, happiness, psychological well-being, and the emergence of hope in students [8], [29], [30]. The city of Yogyakarta is categorized as one of the poorest cities in Indonesia. However, it has the highest index of happiness and life expectancy [39]. One contributing to this condition is the level of sincerity of the citizens in Yogyakarta [32].

There is evidence that KH Ahmad Dahlan is a figure that reflects sincerity. The first proof of KH Ahmad Dahlan's sincerity is Muhammadiyah's motto: "Long live Muhammadiyah, do not seek life in Muhammadiyah." This motto means that individuals must be sincere in fighting for Muhammadiyah, not make a living in Muhammadiyah [40]. The following proof of KH Ahmad Dahlan's sincerity is the theology of Surah Al-Maun, which teaches individuals to be sincere in giving close ties, giving alms, and helping people experiencing difficulties. KH Ahmad Dahlan's version of Al-Maun's theology is sincere in helping people who experience difficulties in various fields [21], [41].

Education in Indonesia emphasizes the character education process that students can understand and implement in everyday life [42]. Sincerity is an important part of the moral development process. So, sincerity can form the basis of personal and social development needs in life. Sincerity is important to develop because it influences people in making judgments, is in line with the principles adopted by society, and can prevent corruption or dishonesty [43]. In the context of social life, sincerity can influence the social relations of modern society which fosters social trust. This research is important to prepare a sincerity scale instrument that is valid and reliable in the measurement process.

Only a few studies have produced a sincerity scale to measure the level of sincerity of students, especially in Indonesia. One of the studies that specifically developed the sincerity scale showed that the sincerity scale consisted of ten items in two aspects, namely sincere social interactions and sincere emotional responses [16]. Another study produced a sincere scale comprising 22 statement items: having transcendental motives, the ability to control emotions, the absence of a sense of superiority, and being a servant of God [17], [18]. The weakness in the development of the instruments in the two studies above is the use of data analysis techniques using confirmatory factor analysis so that they are less able to provide a more accurate and complete description of the information about the validity and reliability analysis of the instruments. Analysis of the IRR coefficient of Cohen's Kappa and Rasch models selected in the instrument's validity and reliability analysis technique addresses the weaknesses of the confirmatory factor analysis technique, both from the content and construct aspects [24]–[26], [44].

As an instrument that can portray the level of sincerity of students, KH Ahmad Dahlan's version of the sincerity scale includes four indicators, namely having transcendental motives, the ability to control emotions, the absence of a sense of superiority, and being a servant of God. The four indicators were chosen as the basis for developing the instrument because they follow the sincere context of muslim students in Indonesia. Each student becomes a servant of Allah SWT, on the intangible motives indicator. Students carry out the obligations and prohibitions of Allah SWT, as a form of realization of submission [45]. The indicator of the ability to control emotions, every student ideally has emotion regulation skills that are used to bring up a sincere attitude when accepting various situations. In the aspect of the absence of a sense of superiority, it focuses on the ability of students to suppress superiority urges in themselves which can encourage the emergence of arrogant attitudes [46]. Finally, the indicator of being a servant of God emphasizes the ability of students to worship and serve Allah SWT [47].

The research results in the KH Ahmad Dahlan version of the sincerity scale have contributed to the science of guidance and counseling. One of the contributions of the results of this research is that it can support guidance and counseling assessment activities. The assessment results become the basis for developing the guidance and counseling program [48]. This study has a specific goal of increasing sincerity. Increased sincerity in every student, especially muslim students in Indonesia, correlates with the emergence of happiness, acceptance, and psychological well-being in students. These conditions can increase academic performance and student academic achievement [49]–[51].

Research activities that develop KH Ahmad Dahlan's version of the sincerity scale have limitations. The first limitation is that the instrument is limited to muslim students in Indonesia. The instrument has yet to be prepared with the aim of all students in Indonesia, especially students who have religions other than Islam. The second limitation is that the instrument was tested by involving Muhammadiyah school students in Yogyakarta. Muhammadiyah school students in Yogyakarta became a pilot project for developing the KH Ahmad Dahlan version of the sincerity scale instrument. The third limitations, including that trials need to be carried out on a large scale on more varied respondent criteria. Apart from that, the trial was carried out in only one area in Indonesia, so it was necessary to expand the trial area. This study was carried out on a paper basis, so it is necessary to disseminate it in an online version.

We recommend several things for the practice of further assessment and research activities. Recommendations to practitioners, they should be able to use the KH Ahmad Dahlan version of the sincerity scale as an instrument for assessing student sincerity issues, especially muslim students in Indonesia. Furthermore, recommendations for future researchers should generalize the test subjects to regions in Indonesia and not be limited to one region in Indonesia. Apart from that, future researchers also need to develop a sincerity scale for broader needs, both for students in Indonesia and even students in the world. Recommendations for further research are the distribution of trial respondents with various criteria and from different regions. Future researchers can carry out additional analysis related to psychological scale instruments that are relevant to the sincerity variable so that they can see comprehensively the correlation between aspects or variables. The implications of this study for guidance and counseling services in schools include i) assessment tools before providing services (need assessment), ii) school counselors can use the results of students' scores as a source of support for providing guidance and counseling services, and iii) school counselors can determine the type of services provided to students which are preventive and developmental, as well as curative.

4. CONCLUSION

Sincerity is a positive character that characterizes muslim students in Indonesia. One of the figures that reflects his sincere character is KH Ahmad Dahlan, a national hero who founded the Muhammadiyah organization. The importance of sincerity to muslim students in Indonesia is the background to know the portrait of student sincerity. The instrument referred to in this research is KH Ahmad Dahlan's version of the sincerity scale. The results of the content validity analysis show that islamic psychometric experts agree on the acceptability of each item of the sincerity scale version of KH Ahmad Dahlan in its contribution to measuring the level of sincerity of muslim students in Indonesia. In addition, the results of construct validity analysis using Rasch analysis provide information that the instrument can measure what it should measure. KH Ahmad Dahlan's version of the sincerity scale is an instrument that can be used by counselors to measure the level of student sincerity correctly. School counselors can implement the implications of the assessment results as a basis for developing guidance and counseling services in schools with preventive development and responsive efforts.

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