Development of a Digital-Based Attitude Assessment Model in Distance Learning

Mutiara Arlisyah Putri Utami

Departement of Tadris Matematika, Faculty of Tarbiyah and Teacher Training, UIN Maulana Malik Ibrahim Malang, Indonesia

Info Articles

Abstract

Assessment is a fundamental aspect of distance learning, because it describes several aspects of assessment, one of which is attitude. However, there were challenges in distance learning assessment, RnD research aims to develop a digital-based attitude assessment model that can be used as a reference for an attitude assessment model. The Spiral Action Research design consisted of the Look, Think, and Act stages using the development steps of Borg & Gall, 1989. Data were collected through documentation, observation, interviews, FGDs, and questionnaires on research subjects, namely active students using distance learning systems. The results of the analysis using the SPSS 16.0 and Lisrel applications show an assessment model with a value of r2 or a correlation of 1.0, Standardized Factor Loading > 0.5, or valid. In addition, all parameters show the goodness of fit index model criteria, Chi-square index or x2 of 2.40 and p-value of 0.792 or ≥ 0.05 so that the level of fitness is in a good category, then the RMSEA index of 0.00012 or ≤ 0.08 is also included in the level of a good fit, while the Normed Fit Index, Non-Normed Fit Index, Comparative Fit Index, Incremental Fit Index, Relative Fit Index, Goodness of Fit Index show results ≥ 0.90 which is 1.00 and Adjusted Goodness of Fit Index is 0.98 which is also included in a good level of fit. The attitude assessment model is divided into two aspects, namely aspects of social attitudes and spiritual attitudes. Aspects of social attitudes are measured through seven indicators, namely honesty, discipline, responsibility, Pancasila, respect for achievement, friendship or communication, and independence, then the spiritual aspect can be measured through four indicators, namely religious, environmental care, tolerance, and social care.

* Correspondence Address:
E-mail: mutiara.arlisyah@fitk.uin-malang.ac.id

INTRODUCTION

Distance learning has becoming a solution in overcoming the Covid-19 pandemic as well as becoming a new trend in the 21st-century learning system, especially in higher education. Even though this system has been implemented for a long time by the Universitas Terbuka, distance learning is still something that is not so easily adopted by several universities.

(Kearsley. G, 2005) states that distance learning is "planned learning that takes place separately from the teacher, requires special learning designs and techniques, communicates through various technologies, and uses a special organizational and administrative structure". Therefore, technology is something that cannot be separated in distance learning systems, meaning that the methods used in the learning process utilize existing technology and digital platforms. The Distance Learning Guide (2020) states that the curriculum for Distance Learning implemented during the pandemic is expected to provide meaningful learning experiences and focuses on life skills, as (Abidah et al., 2020; Palloff, 2001)states that there are high expectations for institutions and students to gain meaningful online learning experiences. In addition, it is hoped that Distance Learning can also provide various learning activities and assignments that are in accordance with the interests and conditions of students. This can be demonstrated by the existence of feedback from evidence or learning products that can be illustrated through the evaluation results.

Evaluation is a fundamental aspect of education because the scope of the assessment and evaluation results describes the comprehensive capabilities of various elements. (Nurbudiyani, 2013) an educator obtains data on the progress of students' abilities through evaluations that represent three cognitive, affective, and psychomotor domains. The skill of conducting assessments is one of the teacher's competencies in addition to mastering the theoretical basis (Abidin et al., 2020; Escueta et al., 2017; Heru Mugiarso,Anwar Sutoyo, 2019) However, in reality, educators experience difficulties in evaluating distance learning, especially in the attitude aspect (Ariesca et al., 2021; Escueta et al., 2017) state that educators experience difficulties when planning, implementing and evaluating. This can be seen from the educator's difficulties in determining the type of assessment which is used specifically to assess aspects of attitude, especially with the condition of the object of assessment which cannot be observed directly. In addition, there are still many who do not understand the learning outcomes of the attitude aspects, which are summarized in several points of the SN Dikti and KKNI because the indicators are not summarized, so in the end, there are still many lecturers who assess the attitude, aspects using the like and dislike technique only (Mehrotra et al., 2001; Sadeghi, 2019; Steve et al., 2013; Williams, 2010; Yu-Wen Chen, 2010).

In addition, the problem in assessing and evaluating distance learning is the management of evaluation time; considering the limited time that is owned in the learning process is certainly a challenge in itself to be able to observe and evaluate students in terms of attitude. As (Beebe et al., 2010; Marzuki & Hakim, 2019; Nyoman et al., n.d.; Syahril, 2007) states that the propositions in their study regarding assessment in online learning are more about time management, student responsibility, online media systems, content complexity, and informal assessments. In line with (Gall & Borg, 1989; Gaytan, 2005; Kearns, 2012; Steve et al., 2013), to achieve online learning goals, an educator must inform and provide feedback based on this assessment, but the obstacles that may be encountered are physical distance, dependence on the ability of technological tools, and workload demands which refer to the time required is longer.

Therefore, a digital-based assessment system can be a solution that can be used to facilitate the evaluation process in distance learning assessment. (Syahria et al., n.d.; Tyas et al., 2018) states that the use of digital-based assessment has a positive impact on educators, especially in tertiary institutions, because this can save educators time assessing students, especially in very large classes, stimulate students to learn independently, and improve the quality of education in Indonesia. This is

in line with the (Eyal, 2012; Vlasenko & Teacher, 2014; Wahyudi et al., 2020; Whitelock et al., 2011) the wise use of technological tools to assess students is very important for educators in the educational process, educators with digital assessment literacy will be able to intelligently use various technological applications and systems to provide progress for students, adapt various appraisal approach. Furthermore (Campbell, 2010; Mukti et al., 2020; Shofwan, et. al., 2021) states that the digitization of the assessment process makes it possible to encourage learning and education in a positive direction through observing student work in standard and non-standard forms and to assess students more efficiently, reliably, and in a different way. The implementation of learning assessment (student learning processes and outcomes) to measure the achievement of graduate learning outcomes is based on the principles of assessment which include: 1) educative, 2) authentic, 3) objective, 4) accountable, and 5) transparent, which is carried out integrated manner (Syamsuddin, 2023; Syamsuddin & Istiyono, 2018; Syamsuddin & Setiawati, 2018; Syamsuddin & Utami, 2021; Utami & Syamsuddin, 2020, 2022).

For this reason, it is necessary to develop a digital-based attitude aspect assessment system as a solution in the distance learning assessment and evaluation process so that the assessment and evaluation of distance learning attitude aspects can run effectively and efficiently.

METHODS

This type of action research uses the Sagor 2005 Spiral Action Research model (Chahin-Dörflinger, 2020), which includes three stages: (1) Look. In this case, the vision and targets are clarified by optimizing the interests and experiences of educators, understanding problems through data collection; (2) Think (think) includes discussing concepts, and theories and analyzing the problems that occur; and (3) Act, which consists of developing or solving problems and conducting evaluations. The educators convey the problems faced and offer solutions while the researchers facilitate the collection of valid and valuable empirical data.

The population in this study were all students of public/private universities. Then by purposive sampling with the criteria of active students in semesters 1 to 4, then the student learning process uses a distance learning system. Data was collected through Spiral Action Research procedures: look, think and act through documentation, observation sheets, interview guides, FGDs, and questionnaires. The data were analyzed through content validity and logical validity tests through expert judgment. Next is the development activity, which consists of extended trial activities through the analysis of instrument items with different power (correlation coefficient) > 0.3 and reliability analysis with criteria for a value of more than 0.80 high confidence level, 0.6-0.79 medium and < 0.6 which is less. (Mardapi, 2017). Then at the final product revision stage, namely product improvement based on operational trial activities using Confirmatory Factor Analysis using three compatibility indices, namely the value of χ^2 (chi-square); p.value > 0.05 CFI (Comparative Goodness of Fit index) > 0.9, and RMSEA (Root Mean Square Error of Approximation) < 0.08.

RESULTS AND DISCUSSION

The assessment model is based on character values and then adjusted to the attitude aspect of learning achievement formulation summarized in the IQF and SN Dikti. The instrument consists of two variables, namely social attitudes and spiritual attitudes, which consist of 4 aspects of spiritual perspectives and seven elements of social attitudes, with a total of 9 indicators of spiritual philosophies and 19 indicators of social attitudes so that the total number of items is 28 statement items.

Content Validity

The results of the content validity of the 28 statements prepared, only 25 items were declared fit for testing. The results of content validity can be seen in below.

Table 1. Content validity of the attitude instrument on distance learning

Variable	Aspect	Number of Items	No. Items Not Eligible for Trial	Number of Grains Eligible for Trial
Spiritual Attitude	Religious	3	-	3
	Enviromental Care	2	-	2
	Social Care	2	-	2
	Tolerance	2	-	2
Social Attitudes	Honest	3	11	2
	Discipline	3	-	2
	Responsibility	2	-	2
	Pancasilaist	4	18	3
	Appreciate Achievements	2	-	2
	Friendly / Communicative	3	26	2
	Independen	2	-	2
	Total	28	3	25

Expanded Trial Analysis

a. Instrument Item Analysis

The analysis showed that all items have a correlation coefficient > 0.3, so the 25 items that have been prepared based on the results of the Gregory test analysis are declared valid or suitable for further research.

b. Reliability Analysis

The calculation results show that the correlation coefficient or alpha coefficient value (Cronbach alpha) of 25 items is 0.905. This instrument is reliable because the correlation coefficient (Cronbach alpha) value is> 0.70.

Analysis of Operational Trial Data

a. Social Attitudes

The results of the SPSS analysis show that the correlation in each aspect is > 0.05 and < 0.9, meaning that every aspect of social attitudes has a relationship, but the relationship of each element still measures different things, or in other words, each piece has no part. From another aspect. The correlation results can be seen in below.

Table 2. Correlation matrix of social attitude

Correlation Matrix[a]							
	Aspect	Honest	Discipline	Responsibility	Pancasilaist	Appreciate Achievements	Friendly / Communicative	Independen
Correlation	Honest	1.000	.574	.375	.444	.396	.560	.631
	Discipline	.574	1.000	.384	.372	.317	.569	.562
	Responsibility	.375	.384	1.000	.416	.594	.733	.625
	Pancasilaist	.444	.372	.416	1.000	.464	.648	.646
	Appreciate Achievements	.396	.317	.594	.464	1.000	.635	.660
	Friendly / Communicative	.560	.569	.733	.648	.635	1.000	.700
	Independen	.631	.562	.625	.646	.660	.700	1.000

Furthermore, the results of the analysis of the KMO and Barlett s Test values, the results of the research show that the value of the Barlett Test of Sphericity is 401.864 at a significant 0.000, which means that in this study, there is a very significant correlation between aspects and the results of the KMO calculation are 0.821, so that sample adequacy is included in the category that satisfying.

Meanwhile, the Measures of Sampling Adequacy (MSA) values for seven aspects were > 0.5 and < 1.0. Because in every aspect, the MSA value is less than 1, it can be concluded that each of these aspects has errors by other elements and that is what is expected. This can be interpreted that these aspects can be predicted and analyzed further.

In Figure 1, it can be seen that the seven aspects analyzed show that there is only 1 factor, meaning that to see social attitudes in the distance learning is enough to use these seven aspects.
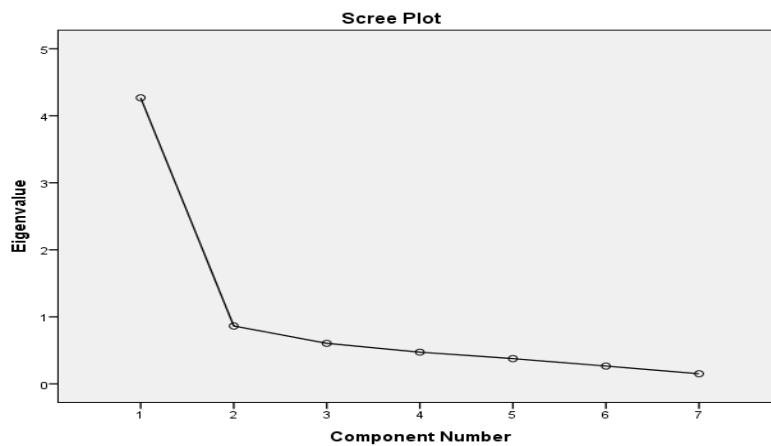

Figure 1. scree plot of social attitudes on distance learning

Based on the results of this analysis, it can be concluded that the items used to measure social attitudes in distance learning are unidemensional, or in other words, the Social Attitudes of Students in Distance Learning can be measured through 7 aspects which include: Honesty, Discipline, Responsibility, Pancasilaism, Appreciate Achievement, Friendly/Communicative and Independent.

b. Spiritual Attitude

The results of the SPSS analysis show that the correlation in each aspect is > 0.05 and < 0.9, meaning that in every part of social attitudes, there is a relationship, but the connection in each element still measures different things, or in other words, each component does not have a part of social behavior. Other aspects. The correlation results can be seen in below

Table 3. Correlation matrix of spiritual attitude

Correlation Matrix				
	Religious	Enviromental Care	Social Care	Tolerance
Religious	1.000	.574	.375	.444
Environmental care	.574	1.000	.384	.372
Social care	.375	.384	1.000	.416
Tolerance	.444	.372	.416	1.000

Furthermore, the results of the analysis of the KMO and Barlett s Test values, the results of the research show that the value of the Barlett Test of Sphericity is 90,606 at a significant 0.000, which means that in this study, there is a very significant correlation between aspects and the results of the KMO calculation are 0.733, so that sample adequacy is included in the category that satisfying.

Meanwhile, the Measures of Sampling Adequacy (MSA) values for the four aspects were > 0.5 and < 1.0. Because in every aspect, the MSA value is less than 1, it can be concluded that each of these aspects has errors by other elements, and that is what is expected. This can be interpreted that these aspects can be predicted and analyzed further.

In Figure 2, it can also be seen that the four aspects analyzed show that there is only 1 factor, meaning that to see spiritual attitudes in the distance learning it is enough to use these four aspects.
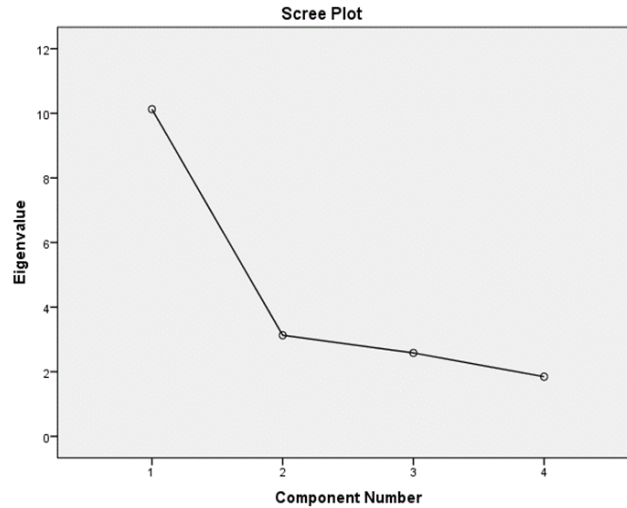

Figure 2. Scree plot of spiritual attitudes on distance learning
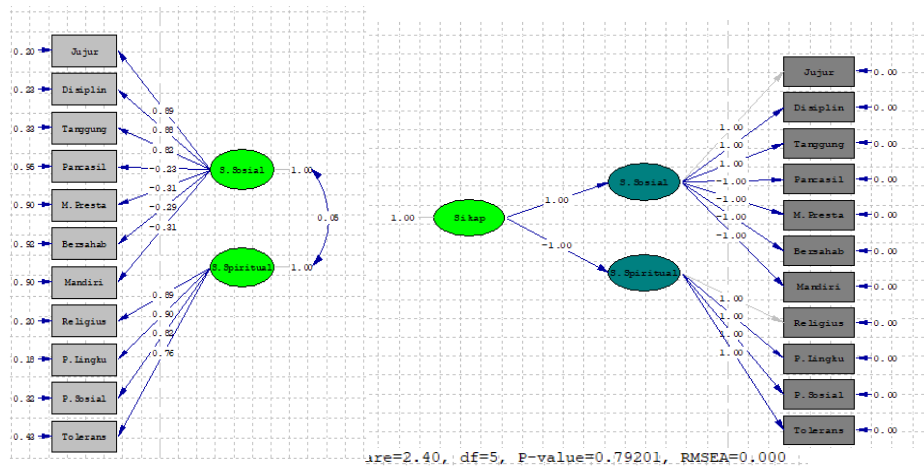
Confirmatory Factor Analysis

Figure 3. Attitude assessment model on distance learning

The results of measurements using the lisrel show the value of r2 or the correlation between the attitude variable and the aspects of social and spiritual attitudes of 1.0. This can mean that all indicators in the instrument for aspects of social attitudes and aspects of spiritual attitudes that have been developed are valid and can represent latent variables, in this case, attitude variables.

Besides that, the construct measurement of the attitude assessment model in distance learning proved that all the indicators, both the seven indicators on social attitudes and the four indicators on spiritual attitudes, had an average contribution of > 0.7. This can be interpreted that the value of the factor loading (Standardized Factor Loading) for each dimension is above 0.5, so the validity is said to be good. According to Igbaria et al. (1991), a variable is said to have good validity to a construct if the standard factor loading is > 0.5. So it can be concluded that the results of the analysis show that

the correlation coefficient between attitude variables and aspects of social attitudes and spiritual attitudes is included in the good category.

Table 4. Goodness of fit attitude assessment model on distance learning

Index	Goodness of Fit	Hasil	Level of Fit
x^2 dan p	litle and $p \geq 0.05$	x^2=2.40 and p= 0.792	Good
RMSEA	≤ 0.08	0.00012	Good
NFI	≥ 0.90	1.00	Good
NNFI	≥ 0.90	1.00	Good
CFI	≥ 0.90	1.00	Good
IFI	≥ 0.90	1.00	Good
RFI	≥ 0.90	1.00	Good
GFI	≥ 0.90	1.00	Good
AGFI	≥ 0.90	0.98	Good

In general, the interpretation based on the nine parameters outcome, which is the criteria of the goodness of fit index model (Diamantopoulos, 1994) in the results of this analysis, also proves that all parameters meet the requirements of the goodness of fit index model. Based on the results of the interpretation of the nine parameters contained shows that all the parameters show the criteria for the goodness of fit index model, the Chi-square index or x2 is 2.40, and the p-value is 0.792 or ≥ 0.05 so that the level of fit is in a suitable category, then the RMSEA index or Root Mean Square Error of Approximation is 0.00012 or ≤ 0.08 is also included in a good level of fit, while the Normed Fit Index, Non-Normed Fit Index, Comparative Fit Index, Incremental Fit Index, Relative Fit Index, Goodness of Fit Index show results ≥ 0.90 which is 1.00 and Adjusted Goodness of Fit Index is 0.98 which is also included in a good level of fit. So it can be concluded that the aspects formed are by the factors being measured, or the assessment model developed can be declared fit.

The indicators that are by latent variables are aspects of social attitude as measured by seven indicators, namely honesty, discipline, responsibility, Pancasilaist, respect for achievement, friendship or communication, and independence, then the spiritual aspect can be measured through four indicators, namely religious, caring for the environment, tolerance and social care.

CONCLUSION

Based on the results and discussion, this study concludes that the digital-based attitude aspect assessment model in distance learning can be divided into two aspects of assessment: elements of social attitudes and spiritual attitudes. Aspects of social attitudes are measured through seven indicators: honesty, discipline, responsibility, Pancasila, respect for achievement, friendship or communication, and independence. The spiritual aspect can be measured through four indicators: religious, environmental care, tolerance, and social care. The analysis of the 25 indicators or statements consisting of 9 hands on the aspect of spiritual attitude and 16 indicators on the element of social attitudes show that the model formed is fit as indicated by the goodness of fit index model criteria that meet the good criteria.

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