

Analysis of Verbal Analogy Ability Test Development in Arabic Language Subject

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Abstrak: This study aims to explain how to design a verbal analogy ability test instrument in Arabic. After the questions were compiled, the researcher analyzed the development of a verbal analogy ability test in Arabic subjects in the form of a validity test, reliability test, discriminatory power test, and test of the difficulty level of the questions. The verbal analogy questions developed were limited to Arabic subjects at the high school level. This research uses a quantitative descriptive method with data collection techniques, using a verbal analogy ability test in Arabic in multiple choice questions. The test analysis method includes a validity test, reliability test, discriminatory power test, and test of the questions' difficulty level using the SPSS version 25 application. The results of this study indicate that five methods can be applied to developing verbal analogy ability test questions in Arabic. The results of the analysis of the verbal analogy ability test in Arabic that was developed were stated to be valid, reliable, and have good discriminatory power, as well as different levels of difficulty for the questions.

Keywords: Development; Test; Verbal Analogy; Arabic;

INTRODUCTION

Assessment plays a crucial role in measuring and evaluating students' abilities in education. However, developing valid and reliable assessment instruments is still challenging, especially when learning a foreign language such as Arabic (Thomure & Speaker, 2018). This problem is further complicated when dealing with high-level cognitive aspects such as verbal analogy ability, which is very important in language acquisition but is often difficult to measure accurately (Al Qahtani, 2015).

This is expected so students in an Arabic language class can easily recognize language patterns, connect different concepts, and apply their linguistic knowledge in various contexts. This potential can be revealed by developing an appropriate verbal analogy ability test. Unfortunately, although Arabic has long been an integral part of the curriculum in many educational institutions in Indonesia, especially in Islamic educational institutions, the development of specific assessment tools to measure verbal analogy ability in Arabic is still very limited (Wekke, 2015).

Verbal analogy is an essential component in language learning, including Arabic. This ability helps students understand the relationship between words, phrases, and language concepts (Sternberg, 2022). Previous studies have shown that using analogies in foreign language learning can improve students' understanding of vocabulary and grammar (Onishchuk et al., 2020). However, most of these studies have focused on English or other foreign languages, while similar research for Arabic is still limited.

Given the increasing interest in Arabic in Indonesia, the development of a verbal analogy ability test specifically for Arabic subjects is becoming increasingly important (Muharom Albantani & Madkur, 2018). Such a test can be an effective tool to measure and improve students' understanding of Arabic structure and meaning while providing educators with valuable insights into students' cognitive processes in language learning (Hasnah, 2015).

The verbal analogy is one form of test that can be used to measure logical thinking skills (Bronkhorst et al., 2020), (Mitchell, 2021), especially those related to the relationship between words (Barbot et al., 2019). This test is often used to assess a person's verbal ability to understand the relationship patterns between concepts made into words or phrases (Stamenković et al., 2019). Sternberg also said verbal analogies can help measure a person's ability to recognize relationships between words and group concepts and predict and apply a person's thinking patterns to new situations (Sternberg, 2022).

Verbal analogies are essential in language learning and training critical thinking skills (Gray & Holyoak, 2021). Understanding the structure and meaning of language (Lupyan & Lewis, 2019) requires this ability. Verbal analogies involve recognizing semantic and grammatical relationships (Lu et al., 2019), which plays a vital role in learning foreign languages, including Arabic.

Test development is essential because it can be a systematic process involving designing, validating, and evaluating student ability measurement instruments (Clark & Watson, 2019). In line with Brown and Abeywickrama also provide a similar explanation because it can be used to measure the consistency of test results (Brown, H. Douglas, Priyanvada, 2019). Al-Tamimi argues that a well-structured test will help teachers and researchers understand the level of language mastery of students; besides that, it can also detect things that need to be improved in learning (Altamimi, 2011).

Arabic is a unique morphological and syntactic structure as part of the Semitic language (Allothman & Alsalman, 2020). This requires a unique approach to developing language tests. Students' ability to master verbal analogies not only reflects vocabulary skills but also the ability to understand structured Arabic morphological structures (Russak & Zaretsky, 2021). Al-Farsi stated that verbal analogy tests can improve students' understanding of the relationship between words in morphological and syntactic contexts.

Psychometric theory can be an important basis for developing language ability tests. Hambleton et al. argue that every ability test must go through the validity and reliability testing stage using the Classical Test Theory measurement model. In addition,

there is also Item Response Theory, which is often known as item response theory. These two theories can be used as an accurate basis for measuring students' abilities according to the desired goals.

METHOD

The descriptive method is a quantitative research method for determining problems that combine in-depth, comprehensive, and in-depth surveys and photography regarding the social situation that is the subject of the study. Various quantitative research methods, such as the descriptive method, aim to systematically describe the facts and characteristics of a particular population group or region factually and accurately (Adil, 2023). This study was conducted to obtain an overview of the validity, reliability, distinguishing power, and difficulty level of the verbal analogy ability test questions in Arabic language subjects. The subjects in this study were 29 high school students in grade X. The data collection technique used a verbal analogy ability test in Arabic using five multiple-choice questions. Data analysis was carried out using SPSS software version 25, which allows efficient and accurate statistical data processing (Field, 2024).

Validity Test

Instrument validity testing ensures that the developed test actually measures what should be measured (Taherdoost, 2016). In this study, validity was tested using the SPSS version 25 application. Distribution of the t table for $\alpha = 0.05$ and degrees of freedom (dk) = n-2, then the Decision criteria:

If $r_{\text{count}} > r_{\text{table}}$ = valid

If $r_{\text{count}} < r_{\text{table}}$ = invalid

If the instrument is valid, the interpretation criteria regarding the correlation coefficient (r) in Table 1 can be seen below.

Table 1. Interpretation of the Correlation Coefficient (r)

Magnitude of r	Interpretation
$0.80 < r < 1.00$	Very high
$0.60 < r < 0.80$	High
$0.40 < r < 0.60$	Quite high
$0.20 < r < 0.40$	Low
$0.00 < r < 0.20$	Very low

Reliability Test

The reliability of the test is tested using the Cronbach Alpha formula, which is suitable for instruments with a Likert scale or multiple choice (Taherdoost, 2016). Interpreting the degree of reliability is using the Guilford criteria (Suherman, 2003). The criteria for the degree of reliability can be seen in Table 2.

Table 2. Classification of the Degree of Reliability

Reliability Coefficient	Interpretation
$0.90 < r_{11} < 1.00$	Interpretation
$0.70 < r_{11} < 0.90$	Very high degree of reliability
$0.40 < r_{11} < 0.70$	High degree of reliability
$0.20 < r_{11} < 0.40$	Quite high degree of reliability
$0.00 < r_{11} < 0.20$	Low degree of reliability

Discriminating Power Test Method

Analysis of discriminating power is a number that shows the difference between high and low groups; most of the high-ability tests answer more questions correctly, and the low-ability test group mostly answers many questions incorrectly. In other words, a question has good discriminating power if bright students can do the questions well and weak students cannot do the questions (Sudijono, 2012). After the discriminating power calculation results through SPSS, the classification is then interpreted as presented in Table 3 (Suherman, 2003).

Table 3. Interpretation of Discriminating Power

Discriminating power	Interpretation
$DP < 0$	Evil
$0,00 < DP < 0,20$	Bad
$0,20 < DP < 0,40$	Enough
$0,40 < DP < 0,70$	Good
$0,70 < DP < 1,00$	Very good

Question Difficulty Level Test Method

The question difficulty level is a quantity used to determine whether a question is included in the easy, medium, or difficult category. If the question details are easy enough, then the question details are good. The level of difficulty of the instrument needs to be known to obtain information about student learning progress (Sudijono, 2012). The calculation of the question difficulty index results is then interpreted with the classification in Table 4.

Table 4. Interpretation of Question Difficulty Level

Difficulty Index	Criteria
$0,00 < IK < 0.30$	Difficult
$0,30 < IK < 0,70$	Moderate
$0,70 < IK < 1,00$	Easy

LITERATURE REVIEW

Verbal Analogy Concept

The verbal analogy is a mental process that allows individuals to understand the relationship between two words or concepts through similarities or differences (Gray &

Holyoak, 2021). It is the ability to see the relationship between words and apply it in different contexts (Anggarista & Wahyudin, 2022). Verbal analogy is essential in language education, where students need to understand and use words in a variety of situations (Gray & Holyoak, 2021).

In Arabic, verbal analogy skills include understanding synonyms, antonyms, and cause-and-effect relationships between words (Elnagar et al., 2023). Using verbal analogies can help students develop better language skills, including vocabulary mastery and critical thinking skills (Nasution et al., 2022).

Analogy theory explains that analogical thinking skills are vital in developing language skills (ZORLU & ZORLU, 2022). Children naturally use this theory to learn about language and other concepts (Thị Tuyết Vân, 2018). In this context, the ability to make analogies helps students assimilate new knowledge into their cognitive structures.

Verbal analogy skills can be measured through various methods, including multiple-choice tests, where students are asked to choose pairs of words with a particular relationship (Septianingsih & Jerusalem, 2021a). In addition, the analogy construction method can also be used, where students are asked to create analogies from given words. Research shows that these methods can effectively measure students' ability to understand and use verbal analogies.

Development of a Verbal Ability Test in Arabic

Developing a verbal ability test in Arabic involves creating a valid and reliable assessment tool (Septianingsih & Jerusalem, 2021b). The test measures students' language ability, including reading, speaking, and understanding sentence structure (Gustanti & Ayu, 2021). Test development should be based on needs analysis, validity, and reliability.

Test development theory emphasizes the importance of content validity in developing assessment instruments (SÜRÜCÜ & MASLAKÇI, 2020). In Arabic, the test should include elements representative of the language ability being measured. It also requires a comprehensive assessment of test validity, including content, construct, and criterion validity.

The method used in developing a verbal analogy test in Arabic involves item analysis to determine each test item's difficulty and discriminating power. Research by Suleman Kadir et al. shows that this approach can improve the validity and reliability of the test and provide insight into areas for improvement in Arabic language teaching. An example of this application is developing a test piloted at various levels of education, including primary and secondary schools (Kadir et al., 2024).

The Use of Verbal Analogy Tests in Arabic Language Education

Verbal analogy tests in Arabic language education provide essential insights into students' language skills (Russak, 2020). The test can evaluate the extent to which students can relate concepts and words in Arabic and the impact this has on their speaking and writing skills (Hassanein et al., 2021). The study's results indicate that

verbal analogy tests can improve students' understanding of Arabic and help them develop better communication skills.

RESULT AND DISCUSSION

Designing Verbal Analogy Ability Test in Arabic

Teachers do not usually prepare analogy test questions, but they are also not questions students often encounter. Analogy questions require comparing two concepts to find similarities or process relationships. Therefore, a method is needed to compile problems prioritising analogical thinking, namely: (1) introducing the target concept. The target concept is an uncommon or poorly understood concept that will be taught to students, (2) reviewing the analogy concept fully. The analogy concept is a common or well-known concept that has usually been taught to students before, (3) identifying related features between the target and the analogy. Collecting all the features of the target and analogy concepts to be identified, (4) mapping the similarities between the analogy and target concepts. If there are many similar features, an analogy can be drawn or taken and the more similar features indicate the better the analogy, (5) identifying exceptional circumstances of an analogy that does not work. Dissimilar features are exceptions to the analogy, (6) concluding the target concepts {Formatting Citation}.

The next step is to give a problem that emphasizes verbal analogy ability in Arabic language material. The following are analogy problems developed from indicators of mathematical analogy ability (Azmi, 2019) into indicators of analogy ability in Arabic (Azmi, 2017).

Table 5. Grid of Analogy Ability Test in Arabic

Analogy Ability Indicator in Arabic	Analogy Ability Indicator in Arabic Learning Material	Number Question
Finding similarity of process from the vocabulary of job and place in Arabic	Students can determine an analogy between the vocabulary of job and place in Arabic	1
Identifying the similarity of process from function or benefit of action in Arabic	Students can determine the analogy of function or benefit of action in Arabic	2
Finding similarity of process from plural or singular form of the word in Arabic	Students can determine an analogy between plural or singular form of the word in Arabic	3
Finding similarity of process from antonym of Arabic word	Students can determine analogy between antonym (opposite word) in Arabic	4
Finding similarity of process from synonym of Arabic word	Students can determine analogy between synonym (similar word) in Arabic	5

The questions are presented in a multiple-choice form to determine the students' verbal analogy thinking process (Wulandari, 2018). The following are questions on verbal analogy skills in Arabic that have been designed:

1. Finding the similarity of the process of a vocabulary of work and place in Arabic

الإختيارات	السؤال	رقم
د. فندق	أ. مستشفى	١
ج. صيدلية	ب. مطار	معلم : مدرسة = طبيب :

Solution:

Mu'allim is a profession, namely a teacher, while madrasah is a place of work for the teaching profession. Based on this analogy (relationship), mustasyfa is a place of work for the profession of doctor or thabib. Therefore, the correct answer is (A) mustasyfa (mu'allim: madrasah = thabib: mustasyfa).

2. Identifying the similarity of the process of the function or benefit of an act in Arabic

الإختيارات	السؤال	رقم
د. شركة	أ. مهنة	٢
ج. وقت	ب. مال	درس : علم = عمل :

Solution:

Dars is an act, namely learning, while 'ilm is a benefit obtained from learning, namely knowledge. Based on this analogy (relationship), maal is a benefit obtained from a job or 'amal. Therefore, the correct answer is (B) maal (dars: 'ilm = 'amal: maal).

3. Finding the similarity of the process of a word's plural or singular form in Arabic

الإختيارات	السؤال	رقم
د. صحف	أ. مصاحيف	٣
ج. مصاحف	ب. مصحف	صحيفة : صحف = مصحف :

Solution:

Shohifah is a singular form, namely koran, while shuhuf is a plural form of shohifah, namely many newspapers. Based on this analogy (relationship), mashohif is a plural form of mushaf or al-Qur'an. Therefore, the correct answer is (C) mashohif (shohifah: 'shuhuf = 'mushaf: mashohif).

4. Finding the similarity of the process of the antonyms of Arabic words

الإختيارات	السؤال	رقم
د. صحة	أ. مرض	٤
ج. صحيح	ب. مستشفى	قام : جلس = مريض :

Solution:

Qooma is a verb, namely standing, while jalasa is a verb, namely sitting, both have an antonym relationship. Based on this analogy (relationship), shohiih is a noun or adjective, namely a healthy person, as opposed to married, namely a sick person. Therefore, the correct answer is (C) shohiih (qooma: jalasa = mariidh: shohiih).

5. Finding the similarity of the process of synonyms in Arabic words

الإختيارات	السؤال	رقم
د. ألم	أ. حمى	هـ
ج. صحة	ب. طبيب	قعد : جلس = مرض :

Solution:

Qo'ada is a verb, namely to sit, while jalasa is also a verb, namely to sit; both have a synonymous relationship. Based on this analogy (relationship), Alam is a noun or adjective, namely a disease, which is the same as marodh. Therefore, the correct answer is (D) Alam (qo'ada: jalasa = marodh: alam).

The following are the scoring guidelines for the verbal analogy ability test in the Arabic language subject for students in the form of multiple-choice questions, as stated in the book Techniques for Compiling Test and non-test Instruments in Table 6.

Table 6. Scoring Guidelines

Answer	Score
Correct	1
False	0

Validity Test Results

The results of the validity test of the verbal analogy ability test in Arabic for students can be seen in Table 7.

Table 7. Scoring Guidelines

No	r count	Interpretation r	r table	Decision
1	0.442	Quite high	0.329	Valid
2	0.678	High	0.329	Valid
3	0.490	Quite high	0.329	Valid
4	0.863	Very high	0.329	Valid
5	0.863	Very high	0.329	Valid

		Correlations					
		VAR00001	VAR00002	VAR00003	VAR00004	VAR00005	VAR00006
VAR00001	Pearson Correlation	1	-.064	.052	.209	.209	.442*
	Sig. (2-tailed)		.743	.788	.276	.276	.016
	N	29	29	29	29	29	29
VAR00002	Pearson Correlation	-.064	1	.313	.478**	.478**	.678**
	Sig. (2-tailed)	.743		.099	.009	.009	.000
	N	29	29	29	29	29	29
VAR00003	Pearson Correlation	.052	.313	1	.204	.204	.490**
	Sig. (2-tailed)	.788	.099		.288	.288	.007
	N	29	29	29	29	29	29
VAR00004	Pearson Correlation	.209	.478**	.204	1	1.000**	.863**
	Sig. (2-tailed)	.276	.009	.288		.000	.000
	N	29	29	29	29	29	29
VAR00005	Pearson Correlation	.209	.478**	.204	1.000**	1	.863**
	Sig. (2-tailed)	.276	.009	.288	.000		.000
	N	29	29	29	29	29	29
VAR00006	Pearson Correlation	.442*	.678**	.490**	.863**	.863**	1
	Sig. (2-tailed)	.016	.000	.007	.000	.000	
	N	29	29	29	29	29	29

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

Figure 1. Data Processing Results

Reliability Test Results

The results of the reliability test of the students' Arabic verbal analogy ability test can be seen in Table 8.

Table 8. Reliability Test Results

Cronbach's Alpha Value	Interpretation
0.679	Quite a high degree of reliability

Reliability Statistics

Cronbach's Alpha	N of Items
.679	5

Figure 2. Data Processing Results

From Cronbach's Alpha value, the Arabic verbal analogy ability test questions are stated to be reliable with a relatively high degree of reliability.

Discrimination Power Test Results

Table 9 shows the results of the discriminating power test of the Arabic verbal analogy ability test.

Table 9. Discriminating Power Test Results

No	DP	Interpretation DP
1	0.124	Bad
2	0.412	Good
3	0.269	Enough
4	0.750	Very good
5	0.750	Very good

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
VAR00001	1.66	1.663	.124	.766
VAR00002	1.59	1.323	.412	.643
VAR00003	1.10	1.667	.269	.689
VAR00004	1.76	1.190	.750	.483
VAR00005	1.76	1.190	.750	.483

Figure 3. Data Processing Results

Based on Table 9, the Arabic verbal analogy ability test questions generally have different discriminating powers; two are very good, and the other three are bad, enough, and sound.

Difficulty Level Test Results

Table 10 shows the results of the difficulty level test for the verbal analogy ability test in Arabic.

Table 10. Difficulty Level Test Results for Questions

No	TK	Interpretation TK
1	0.31	Moderate
2	0.38	Moderate
3	0.86	Easy
4	0.21	Difficult
5	0.21	Difficult

Statistics

		VAR00001	VAR00002	VAR00003	VAR00004	VAR00005	VAR00006
N	Valid	29	29	29	29	29	29
	Missing	0	0	0	0	0	0
Mean		.31	.38	.86	.21	.21	1.97

Figure 4. Data Processing Results

Based on the table above, the verbal analogy ability test questions in Arabic range from easy to difficult.

Discussion

The test questions on verbal analogy ability in Arabic are declared valid. This means that they can accurately measure students' verbal analogy ability, especially in Arabic language subjects. The interpretation of the correlation/validity coefficient values on verbal analogy ability in Arabic varies, including very high, high, and relatively high. The questions on verbal analogy ability in Arabic are declared reliable. This means that the questions on verbal analogy ability in Arabic consistently provide the same measurement results at different times. In other words, the questions on verbal analogy ability in Arabic in the present and the future can measure students' verbal analogy ability. The questions on verbal analogy ability in Arabic have excellent discriminating power for two questions and three questions, with each being poor, sufficient, and good. This means that the questions on verbal analogy ability in Arabic that have been tested can genuinely differentiate between intelligent students and less bright students. In other words, bright students can answer the questions well, and less intelligent students cannot answer the questions well. Meanwhile, the difficulty level of the verbal analogy ability test questions in Arabic has an appropriate composition: 1 easy category question, two medium category questions, and two difficult category questions. The level of difficulty of the verbal analogy ability questions in Arabic has a normal distribution.

CONCLUSION

The conclusion of this study is (1) How to design a verbal analogy ability test in Arabic, namely: (a) introducing the target concept. The target concept is an uncommon or poorly known concept that will be taught to students, (b) reviewing the analogy concept fully. The analogy concept is a common or well-known concept that has usually been taught to students before, (c) identifying related features between the target and the analogy. Collecting all the features of the target and analogy concepts to be identified, (d) mapping the similarities between the analogy and target concepts. If there are many similar features, an analogy can be drawn or taken and the more similar features indicate the analogy the better, (e) identifying exceptional circumstances of an analogy that does not work. Dissimilar features are exceptions to the analogy, (f) concluding the target concepts. (2) The verbal analogy ability test in Arabic is declared valid and reliable, has good discriminatory power, and has a variety of levels of difficulty.

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