

Measuring the Level of Readiness in SDI Al-Hasaniah Students for Computer-Based Exams Using Technology Readiness Index Method

Deny Novianti⁻¹, Anggi Oktaviani⁻², Dahlia Sarkawi⁻³, Muhamad Zul Fahmi⁻⁴

Sistem Informasi; Administrasi Perkantoran
Universitas Bina Sarana Informatika
Jakarta, Indonesia

denynov.dov@bsi.ac.id, dahlia.dls@bsi.ac.id

Informatika
Universitas Nusamandiri
Jakarta, Indonesia

anggi.aov@nusamandiri.ac.id, mzulfahmi56@gmail.com

Abstract

Current technology will continue to develop at any time, one of which is in the Indonesian education sector. In this case, we must continue to provide support and innovation in updating all our knowledge in the technology field. Suppose we do not want to be left behind in education. In that case, we must continue to develop the application of learning to create comfortable understanding while not being left behind with the times and technology, one of which is a computer-based written examination to basic students that will be applied in primary education later therefore, Here I will interview how much readiness for students and teachers to be able to accept the latest regulations in terms of final level assessment at the school level, namely exams that aim to be the strength of the passing scores of students. In applying this computer-based exam, it is necessary to research how much students' readiness to come changes using the Technology Readiness Index (TRI) method. The use of this method uses an index to measure the level of preparedness for use in new technology to achieve the goal of minimizing fraud or leakage of value data. Four variables of readiness level are used in this study: optimism, innovativeness, discomfort, and insecurity. In this study, data was obtained totaling 30 respondents, resulting in a total TRI value of 3.18, categorized into High Technology Readiness. That way, primary students are prepared and capable of changing the online examination system.

Keywords: Computer-Based Exam-1, Technology Readiness Index-2, High Technology Readiness-3

Abstrak

Teknologi saat ini akan terus berkembang setiap saat salah satunya adalah disektor pendidikan Indonesia. Dalam hal ini kita harus terus memberikan dukungan, dan inovasi dalam memperbarui segala sesuatu pengetahuan kita dalam bidang teknologi jika tidak ingin ketinggalan, begitu juga dalam dunia pendidikan harus terus mengembangkan penerapan pembelajaran agar tercipta pembelajaran yang nyaman sekaligus tidak ketinggalan dengan perkembangan zaman dan teknologi, salah satunya adalah ujian tertulis berbasis komputer kepada siswa dasar yang akan diterapkan dalam pendidikan dasar nantinya maka dari itu disini saya akan mewawancarai seberapa besar kesiapan kepada siswa maupun guru untuk bisa menerima regulasi terbaru dalam hal penilaian tingkat akhir dimasa jenjang sekolah yaitu ujian yang bertujuan menjadi daya nilai kelulusan para siswa. Dalam penerapan ujian berbasis komputer ini perlu diadakan penelitian untuk mengetahui seberapa tingkat kesiapan siswa terhadap perubahan yang akan datang menggunakan metode Technology Readiness Index (TRI). Penggunaan metode ini menggunakan index untuk mengukur tingkat kesiapan penggunaan dalam teknologi baru agar tercapainya tujuan dalam meminimalisir kecurangan atau kebocoran data nilai. Ada empat variabel tingkat kesiapan yang digunakan dalam penelitian ini, yaitu: optimism, innovativeness, discomfort, dan insecurity. Dalam penelitian ini data diperoleh berjumlah 30 responden yang menghasilkan nilai total TRI sebesar 3,18 yang dikategorikan kedalam High Technology Readiness. Dengan begitu siswa dasar sudah sangat siap dan mampu dalam perubahan sistem ujian online.

Kata kunci: Ujian Berbasis Komputer-1, Technology Readiness Index-2, High Technology Readiness-3



INTRODUCTION

The learning process is required to continue to advance. With the existence of computers, the learning process that adopts Information and Communications Technology (ICT) is felt necessary to become a new standard of learning (Prissy & Hidayat, 2023). Testing is one approach that aims at the learning evaluation process. In education, exams are planned to measure students' achievement levels so that educators and students can know their ability to understand the field of study (Handrianto & Sanjaya, 2020). The test implementation evaluates learning outcomes in the middle of the semester or at the end to determine whether students have met the minimum learning completeness criteria (N, 2022). The use of IT that is underutilized in the world of education, especially in remote areas or small cities in Indonesia, is caused by limited knowledge, mastery, facilities, budget, and poor Internet networks in specific areas. The use of IT that is underutilized in the world of education Indonesia, is caused by limited knowledge, mastery, facilities, budget and poor Internet networks in certain regions (Pranata, 2017).

Information and communication technology development is very rapid, and the need to analyze is increasing in almost all areas of life. One of them is in education (Kaunar et al., 2020). In learning, one of the instruments that can be used to conduct evaluations is exams. One form often done is a written exam, which includes essays, multiple choice, and oral examinations (Adhitama et al., 2022). These technological innovations led some educators to understand computers, and later the Internet, as revolutionary tools that could be used to present interactive teaching materials in new ways not previously available through other media (Hadi et al., 2020). However, students in Indonesia have not mastered the use of technology. It is necessary to simulate facing the national exam (Hadi et al., 2020). Learning outcomes can be known through the implementation of tests. The test implementation evaluates learning outcomes in the middle of the semester or at the end to determine whether students have met the minimum learning completeness criteria (N, 2022). What is currently an obstacle is the availability of computer devices. Although many schools claim to be ready, the conditions are not complete. Many schools still lack computer equipment (Muna et al., 2018). It is not easy to implement ANBK at the elementary / madrasah level. The first problem is infrastructure; not all elementary schools in Asahan

Regency have as many computer/laptop facilities as the number of students. Second, many teachers at the elementary / madrasah level still need to adapt better to the use of technology (Santoso et al., 2022).

Therefore, before implementing a new technology, it is necessary to know the level of readiness for acceptance of the technology. One way is to measure technology readiness from the technology and human side (Yuda1 & Rahmat Yasirandi2, Dita Oktaria3 1, 2, 2021). The implementation of ANBK in this school has several problems, namely, in operating hardware such as computers, laptops, and software. In addition, difficulties are faced, such as poor internet networks, which impact the comfort of implementing ANBK in schools (Hutahaeen et al., 2022). The process of implementing information technology often causes new problems. The success of implementing information systems or technology adoption significantly affects user readiness (Harianja et al., 2023). To start a new learning system, there needs to be a process and evaluation so that the learning system can be applied optimally (Ahmad et al., 2021). TRI uses a series of confidence statements in conducting surveys to thoroughly measure individuals' technological readiness levels (Dzulkifli et al., 2020). Technology Readiness Index (TRI) measures new technology users' readiness to achieve goals in daily life and work, where measurements are made using optimism, innovativeness, discomfort, and insecurity (Yusuf et al., 2020). TRI is an index to measure users' readiness to accept and use new technology to achieve goals in daily life and work (Angraini & Suryadi Dedet, 2015).

From this explanation, an exciting discussion emerged to be further investigated, titled "Measuring the Level of Readiness in SDI (PLUS) AL-HASANIAH Students for Computer-Based Examinations Using the Technology Readiness Index Method." Due to the development of the times in this new era, it is required that every school make updates in all aspects of learning and when taking grades such as Computer-Based Exams, and also for character surveys that measure attitudes, values, and confidence in facing computer-based exams.

RESEARCH METHODS

The concept that will be the basis of the system, in overcoming readiness for exams in primary students in assessing survey analysis using the Technology Readiness Index (TRI) method, which will be put forward as follows:

Readiness Level (Readiness)

Readiness is a condition where a person or individuals are willing or ready to do something to achieve a specific goal (Nita et al., 2020). The level of readiness in the Technology Readiness (TR) aspect is how individuals or organizations can readily adapt, use, and utilize technology in their daily activities. In every move, it is necessary to have a readiness that is good enough to support the success of all activities (Nurdiansyah & Jayanto, 2021).

Technology Readiness Index (TRI)

Some of the methods used to determine the level of readiness include the Technology Readiness Index (TRI), Technology Acceptance Model (TAM), Chapnick ELR Model, Aydin and Tasci ELR Model, and so on. In this research, the author chose the Technology Readiness Index (TRI) method as a method used to measure the level of readiness. In addition to being easier to understand, according to the author, this method is enough to determine SD Muhammadiyah 09 Plus' willingness to apply e-learning learning methods.

This study uses the Technology Readiness Index method to measure each individual's readiness level with 4 personality variables: Optimism, Innovativeness, Discomfort, and Insecurity (Nita et al., 2020). The Technology Readiness Variable (TRI) can be seen in Figure 1 below.

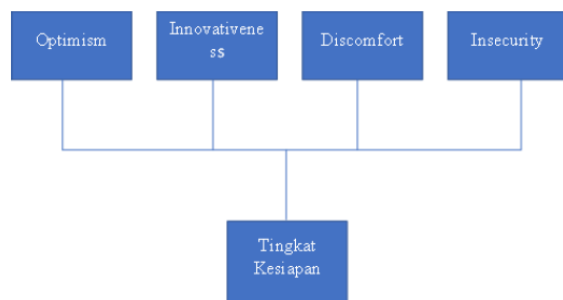


Figure 1. Readiness Level

Here are four explanations of essential components in the picture above that can affect the level of readiness of users in using and utilizing technology (Ahmad et al., 2021).

1. Optimism - The common belief that technology and innovation have positive benefits. It takes a positive view of technology and can increase control, flexibility, and efficiency in everyday life and work.
2. Innovativeness - The tendency to want to experiment, learn, and talk about using the latest technology and being able to use constantly updated technology.

3. Discomfort - Perceived lack of control over technology. Using technology in everyday life or work creates a sense of despair. The tendency is still to use traditional or manual means.
4. Insecurity - The belief that technology can have a devastating impact on users and society. There is a sense of inconvenience for users when using technology, one of which is for personal or privacy reasons (Nita et al., 2020).
5. There are 3 categories in the application of readiness index technology developed by (Nita et al., 2020), namely:
 - a. Low technology readiness: TRI is considered low if TRI is equal to or less than 2.89 ($TRI \leq 2.89$).
 - b. Medium technology readiness: TRI is considered to exist at the medium stage if TRI is between 2.90 and 3.51 ($2.90 \leq TRI \leq 3.51$).
 - c. High technology readiness: TRI can be considered high if TRI is above 3.51 ($TRI > 3.51$).

The TRI value can be calculated from the mean value of each questionnaire multiplied by the weight of each statement. Each variable weighs 25%. The statement weight is derived from the variable weight divided by the number of per-variable notices. After that, the mean value of each statement is multiplied by the weight of each variability of the information. The TRI value can be obtained from the total number of all variables (Nurdiansyah & Jayanto, 2021).

Questionnaire

In any research and research, data is an important part. There are various ways and techniques to obtain and collect data; one is to make a questionnaire (Herlina, 2019).

A questionnaire is a list of questions given by users to others who are willing to respond according to the questions asked. Questionnaires or questionnaires, when viewed from how to answer, are divided into two types, namely:

- a. An open-ended questionnaire, which allows respondents to answer in their own sentences.
- b. A closed questionnaire was provided with answers, so respondents only had to choose (Syamsuryadin & Wahyuniati, 2017).

In the closed questionnaire, there are questions or statements that the researcher has provided regarding the choices of respondents. This is to make it easier for researchers to map or analyze questionnaire data obtained from respondents. Open questionnaires give respondents to give answers or responses, usually

given a question, and respondents can write their answers in the form of descriptions (Syamsuryadin & Wahyuniati, 2017).

Questionnaires, as one of the scientific research instruments, are widely used in social research, such as research in the fields of human resources, marketing, and study on behavior (behavioral research) concerning problems in the field of accounting (behavioral accounting) and finance (behavioral finance) (Kiswandari et al., 2016).

The questionnaire is a primary data collection tool with survey methods to obtain respondents' opinions. Questionnaires can be distributed to respondents by:

- (1) Directly by the researcher (independent);
- (2) Sent by mail (mailquestionair);
- (3) Sent by computer, e.g., e-mail.

Researchers send Questionnaires directly if respondents are relatively close and the distribution is not too wide. Post or e-mail allows low costs, wider reach of respondents, and fast time. There is no specific principle, but researchers can consider their effectiveness and efficiency in terms of being sent by post, e-mail, or directly from the researcher (Kiswandari et al., 2016).

Test validity

The validity of a test questions whether it measures what it is trying to measure. The point is that how far a test can reveal precisely the actual characteristics or conditions of the measuring object will depend on the level of validity of the examination concerned (N, 2022). The indicator in the questionnaire can be valid if the result's r value is greater than the r of the table. This study's instrument validity test was carried out with Pearson's Product Moment analysis (S. K. Dewi and A. Sudaryanto, 2020).

Some evidence can prove the validity of the instrument. This evidence includes content, known as content validity or content validity. Constructively, or known as construct validity, criteria, or criterion validity.

Content Validity

The content's or focus content's validity provides evidence of the elements present in the measuring instrument and is processed by rational analysis. Experts assess the validity of the content. The assessment will be more straightforward when the measuring device is described in detail.

After testing the validity of the content to experts, the instrument is revised according to suggestions/input from experts. Agencies are declared valid in scope depending on the expert.

Experts are free to judge whether these instruments are good or not. Indicators that an agent is applicable are:

The expert has received the instrument, both in content and format, without any further improvement. If the expert still asks for improvement after revision, the correction still needs to be done until the expert accepts the instrument without further modification (Fraenkel, Wallen, & Hyun, 2012). [book.9].

Construct Validity

Construct validity refers to the quality of the measuring instrument used, whether or not it has really described the theoretical construct used as the basis for operationalization. In short, construct validity assesses how well a researcher translates the theory into measuring instruments (Widodo, 2006).

Validity of Criteria

Criterion validity, also called predictive validity, is a test device's validity in making predictions that can predict student success in the future (Arifin, 2017). These other instruments are referred to as criteria.

The difference between the two test validity criteria lies in when the instrument is tested with the criteria.

Suppose instrument testing and criteria are carried out at different times. In that case, it is called predictive criteria validity, while if instrument testing with standards is carried out simultaneously, it is called concurrent criterion validity. The instrument test results and its criteria are then linked to the correlation test. The following presented a correlation formula 1 to find the correlation coefficient of the instrument test results with the test criteria.

$$r_{xy} = \frac{n(\sum x_i y_i) - (\sum x_i)(\sum y_i)}{\sqrt{(n(\sum x_i^2) - (\sum x_i)^2)(n(\sum y_i^2) - (\sum y_i)^2)}} \dots\dots\dots(1)$$

r_{xy} = correlation coefficient

n = number of respondents

x_i = score of each item on the instrument

y_i = score of each item on the criterion. This value coefficient is called the validity coefficient (Fraenkel, Wallen, & Hyun, 2012).

The value of the validity coefficient ranges from +1.00 to -1.00. A coefficient value of +1.00 indicates that individuals in both the instrument test and the criterion test have relatively similar results, while if the validity coefficient is 0, it means no relationship between the instrument and its criteria. The higher the value of the validity



coefficient of an instrument, the better the instrument (Syamsuryadin & Wahyuniati, 2017).

From the journal obtained according to Adamson & Prion, 2013 Reliability testing using the Cronbach Alpha test was carried out for instruments that had more than 1 correct answer. These instruments are, for example, essays and questionnaires (Syamsuryadin & Wahyuniati, 2017).

The formula of the Cronbach Alpha reliability coefficient is as follows.

Reliability

Reliability can be referred to as the permanence of a method or research result in **Esi Rosita**. If a variable shows an Alpha Cronbach value of >0.60 , it can be concluded that it can be reliable or consistent in measuring (S. K. Dewi and A. Sudaryanto, 2020).

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The Formula 2 of the Cronbach Alpha reliability coefficient is as follows.

$$r_i = \frac{k}{(k-1)} \left\{ 1 - \frac{\sum s_i^2}{s_t^2} \right\} \dots\dots\dots (2)$$

Reliability Test Formula

r_i = Alfa Cronbach reliability coefficient

k = number of question items

$\sum s_i^2$ = sum of variances in the score of each item

s_t^2 = total variance

Time and Place of Research

This research was conducted at the head office of SDI AL-Hasaniah, Gang Masjid, Taubah 12450, South Jakarta, DKI Jakarta.

In this study, researchers used a data collection method using questionnaires or questionnaires that used online form facilities. Due to the current situation, namely the COVID-19 pandemic, which is less likely to distribute questionnaires directly to respondents, researchers use the facilities provided by Google, namely Google Form, as one of the media to obtain data to be researched.

Target / Subject of Research

The objectives of this study are as follows: In applying this computer-based exam, it is necessary to research how much students' readiness level changes using the Technology Readiness Index (TRI) method. The use of this method uses an index to measure the level of

readiness for use in new technology to achieve the goal of minimizing fraud or leakage of value data. Four (4) variables of readiness level are used in this study: optimism, innovativeness, discomfort, and insecurity. This study obtained data from 30 respondents, resulting in a total TRI value of 3.18, categorized into High Technology Readiness. That way, primary students will be prepared and capable of changing the online examination system.

RESULTS AND DISCUSSION

Respondents who filled out questionnaires in this study amounted to 30 people within the scope of elementary schools, and some teachers and some students responded.

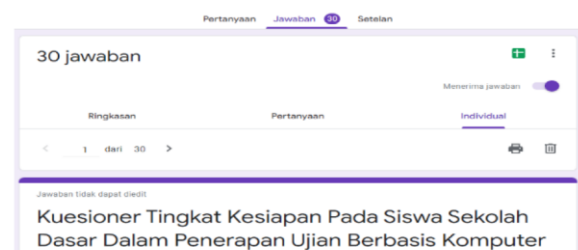


Figure 2. Number of respondents who answered the questionnaire

Validity and Reliability

A validity test shows the extent to which a measuring instrument is used in measuring what is being measured (Sanaky et al., 2021). Reliability, or reliability, is the consistency of a set of measurements or a series of measuring instruments. This can be either a measurement from the same measuring device (a test with a retest) that will give the same result or, for a more subjective size, whether two raters give similar scores (reliability between raters). Reliability is not the same as validity. This means a reliable measurement will measure consistently but not necessarily measure what it should measure (Sanaky et al., 2021). Pearson Bivariate Correlation is a technique used by correlating the score of each item with the total score. The total score here is the sum of all things. A significantly correlated statement can be valid if the count r is greater than the table r (test of 2 sides with a significance of 5%). The following is a table of validity test results using the SPSS application.

Table 1. Validity Test Results

Indikator	r hitung	r tabel 5% (30)	hasil
OPT 1	0,609	0,361	Valid
OPT 2	0,769	0,361	Valid
OPT 3	0,525	0,361	Valid
OPT 4	0,552	0,361	Valid
OPT 5	0,633	0,361	Valid
INN 1	0,751	0,361	Valid
INN 2	0,746	0,361	Valid
INN 3	0,42	0,361	Invalid
INN 4	0,708	0,361	Valid
INN 5	0,727	0,361	Valid
DIS 1	0,31	0,361	Invalid
DIS 2	0,641	0,361	Valid
DIS 3	0,916	0,361	Valid
DIS 4	0,751	0,361	Valid
DIS 5	0,863	0,361	Valid
INS 1	0,594	0,361	Valid
INS 2	0,574	0,361	Valid
INS 3	0,807	0,361	Valid
INS 4	0,517	0,361	Valid

Based on the table above, all indicators that have a calculated r value more significant than the table r (0.361) can be determined that the hand is valid unless the INN3 indicator is invalid because the calculated r-value (0.42) and DIS1 (0.31) are smaller than the table r (0.361).

Furthermore, a reliability test is carried out, which aims to see the consistency of the data that has been disseminated. The basis of reliability testing is to use the Cronbach alpha method, which is declared reliable if the value is more significant than 0.6. The following are the results of reliability test calculations using the SPSS application.

Table 2. Validity Test Results Reliability Test Table

Variable	Alpha Cronbach	Result
Optimism	0,506	Unreliable
Innovativeness	0,691	Reliable
Discomfort	0,756	Reliable
Insecurity	0,48	Unreliable

Based on Table 2, it can be said that all reliability test results can be reliable if the Cronbach alpha value is more significant than 0.6.

Technology Readiness Index Value Analysis

To get the value of the Technology Readiness Index method, the researcher looks for

the mean value of each question. To get the mean value, the researcher multiplies the weight of the number of statements filled with the Likert scale and, next, divides it. Each variable weighs 25%, divided by the number of comments on each variable. The score of TRI from each variable is obtained from the mean value of the information multiplied by the weight of the total received. Furthermore, the total score is obtained from the sum of the total number of variable values. The TRI Value can be calculated using the formula below.

Number of TRI values from each calculation statement

Number of TRI Values = Σ Now statement value

Number of TRI values = Σ (P1+P2+P3+P4)

Number of TRI values = Σ (0.25+0.24+0.25+0.34)

Total TRI Values = 1.08

The TRI value in the insecurity variable is already known to be 1.08. Furthermore, the value will later be added to the value of the number of other variables to get the total harmony of the TRI value.

Table 3. Total Score of TRI Score

Variable	Score
Optimism	0,8
Innovativeness	0,79
Discomfort	0,51
Insecurity	1,08
Total Score	3,18

From Table 3, it can be seen that the total score of the TRI score is 3.18. This shows that the results of this dissemination of student and teacher opinions are included in the High Technology Readiness category because they are located above 3.15 (>3.15), which means that every user can understand the application of computer-based exams and can also facilitate all options in other matters in the internal interests of the school, etc.

CONCLUSIONS AND SUGGESTIONS

Conclusion

Based on the calculation above, it can be concluded that the level of readiness in elementary school students falls into the High Technology Readiness category with an index of 3.18. The Optimism variable, having a value of 0.8, shows that educational progress has a positive outlook on changes in Indonesia. The second variable of innovativeness has a value of 0.79, which shows

that students have a tremendously innovative nature toward changes in online testing media. Furthermore, the discomfort variable with a 0.51 value shows that students feel comfortable with changes that make it easier to use. Finally, the insecurity variable has a value of 1.08, indicating that students feel confident and can accept change because the number has confidence in understanding it.

Suggestion

In this study, researchers suggested that it is necessary to carry out the technical implementation of e-learning learning after everyone can understand the flow of the online exam because it can help any access to learning media from the subjects held for discomfort variables that must be applied for comfort levels in using computer-based technology changes.

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