Journal of Office Administration: Education and Practice
Volume 3 Issue 3, 163-174 (2023)
https://ejournal.unesa.ac.id/index.php/joa

Developing E-Learning Evaluation Instruments: A Study in Vocational School

Arief Nurrahman
Universitas Negeri Yogyakarta, ariefnurrahman@uny.ac.id

Meita Dwi Cahyani
Universitas Negeri Yogyakarta, meitadwi.2021@student.uny.ac.id

Lisa Nurfatmawati
Universitas Negeri Yogyakarta, lisanurfatmawati@gmail.com

Hendri Wibowo
Shihezi University, hendriwibowo@stu.shzu.edu.cn

Abstract:
This study aims to develop an instrument for evaluating e-learning through the Learning Management System (LMS) in the Office Administration program at vocational schools with the CSE-UCLA evaluation model. Using cluster random sampling, data were collected from 85 respondents in the small-scale and 235 in the wide-scale trial stage. Validation procedures included Aiken's index for content validity, while construct validation utilized Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), with reliability assessed using Cronbach's Alpha coefficient. The results showed that there were five instrument constructs for implementing e-learning. The Aiken index to measure content validity showed a valid item. The validity of the instrument construct was evaluated using EFA with a KMO value of 0.751, and each item had an anti-image coefficient more than 0.5, meaning that the factor analysis requirements for the future were met. The fit model based on the CFA result showed the value of Chi-square (X^2) = 239.61, df = 179, P-value = 0.416, RMSEA = 0.000. The loading factor value was 0.41-0.89 (>0.30), meaning the item was valid. The instrument's reliability showed a value of 0.791, and all instruments developed were reliable.

Keywords: Instrument, Developing, Evaluation, E-Learning

INTRODUCTION

E-learning has been integrated into education since the 1970s. It refers to using information and communication technology to promote active learning anytime and anywhere (Anshori, 2018; Hartanto, 2016). Essential requirements for organizing e-learning activities include using a network, providing support for learning services, and providing tutor services if students have difficulty understanding the learning material. Many schools then use Learning Management Systems (LMS) to support these activities.

Learning Management Systems (LMS) are essential tools in e-learning activities. LMS is a software application that facilitates the administration, documentation, reporting, automation, and delivery of learning activities (Chahal & Patel, 2021; Furqon et al., 2023). This LMS focuses on automation and virtualization functions of learning so that it is carried out electronically (Kasim & Khalid, 2016). Usually, learning using an LMS is developed dynamically on a web basis.

The COVID-19 pandemic in 2019 has significantly impacted different aspects of life. The Indonesian government has implemented a policy in the education sector to prevent the spread of the COVID-19 virus. This policy involves closing schools and replacing them with online learning (Handarini & Wulandari, 2020). With online learning, social interactions among students will significantly decrease, thereby reducing transmission between children, adults, and within school settings. (Yuliana, 2022). Since the COVID-19 pandemic, e-learning has been widely used to keep the education system running despite the emergency of the spread of COVID-19 (Alturki & Aldraiweesh, 2021).

After the pandemic, many schools continued to use e-learning to support learning services (Rohana, 2020). Many schools use e-learning services, even though they have yet to be fully used. This is because e-learning helps overcome limitations between students and teachers during certain conditions or when face-to-face classroom activities are impossible. Tena et al. (2021) also explained that e-learning, a distance learning instrument, provides innovative alternative learning so that it can be carried out flexibly and is rich in opportunities to suit the needs and demands of 21st-century students.

The change in the learning system from face-to-face classes to distance learning has hurt the learning system and learning outcomes (Mar'ah et al., 2020). These changes encourage transformation in the education sector. Three fundamental changes in global education (Purwanto et al., 2020) include (1) changing the way millions of people get education, (2) innovation in the learning process, and (3) the digital divide between students and educators.

The digital divide will be visible in student learning outcomes. The challenge for teachers is innovation in delivering learning material by adapting to students' conditions (Tanuwijaya & Tambunan, 2021). Through the e-learning system, students can still access online learning materials(Yanto & Retnawati, 2018). However, adopting the e-learning system is difficult because the appropriate class design and delivery methods must support it.

The progress of the e-learning model certainly needs to be evaluated to determine the level of success and effectiveness. Evaluation is a stage that must be carried out in program implementation to ensure that the program objectives are appropriate (Gronlund & Robert, 1991; Stufflebeam & Shinfield, 1985). Several educational policies resulting from evaluations were also implemented from 2020 to 2021, namely the elimination of the National Examination, the emergency curriculum, and the provision of study quotas. However, in reality, the evaluation of e-learning has yet to be carried out comprehensively (Ariesta et al., 2021). Something similar to what Giatman et al. (2020) said is that student readiness in implementing e-learning shows that 40.5% of students need more time to be ready. Students and educators who used to operate online learning platforms still need time to learn, which affects learning less than optimal (Gao et al., 2022; Krome, 2021).

Observations at vocational schools throughout Yogyakarta also show that students and teachers have yet to become accustomed to online learning, especially in office administration majors. Numerous obstacles prevent the efficient implementation of e-learning, showing challenges for teachers in evaluating its effectiveness. Thus, evaluating e-learning is necessary. Observations and interviews with teachers and school principals show a need for e-learning evaluation due to instrument usability issues. Valid and reliable evaluation tools for e-learning are essential to reflect the learning environment accurately. The instruments developed were also adapted to the characteristics of vocational schools.

Designing and developing evaluation instruments is crucial to supporting learning evaluation implementation, particularly in e-learning, to ensure adequate performance (Gao et al., 2022). Long before the COVID-19 pandemic, widespread use of e-learning often failed to achieve its goals, motives and hopes due to a lack of quality assessment guidelines. (Sintawana et al., 2020; Sustiawati & Zakiyah, 2022). Therefore, developing e-learning evaluation instruments is very important. Valid and reliable instruments are essential to obtain good information about evaluating the implementation of online learning in schools.

RESEARCH METHOD

This study aimed to develop an e-learning evaluation instrument for vocational schools specializing in office administration. The instrument consisted of five components: system assessment, program planning, program implementation, program improvement, and certification. The instrument was developed from the CSE-UCLA evaluation model and employed several modified steps from Mardapi (2008), as shown in Figure 1. The steps used in instrument development are objective specification and instrument study, followed by description and specification of the objective theory. The collected hypotheses are then operationalized, and a scale is chosen to develop instrument items. The instrument items are then examined, and a prototype is constructed for testing. Following instrument preparation, a small-scale trial is performed, followed by explanation and revision. After revising the instrument, a large-scale trial is carried out and revised to provide an e-learning instrument suited for assimilation.

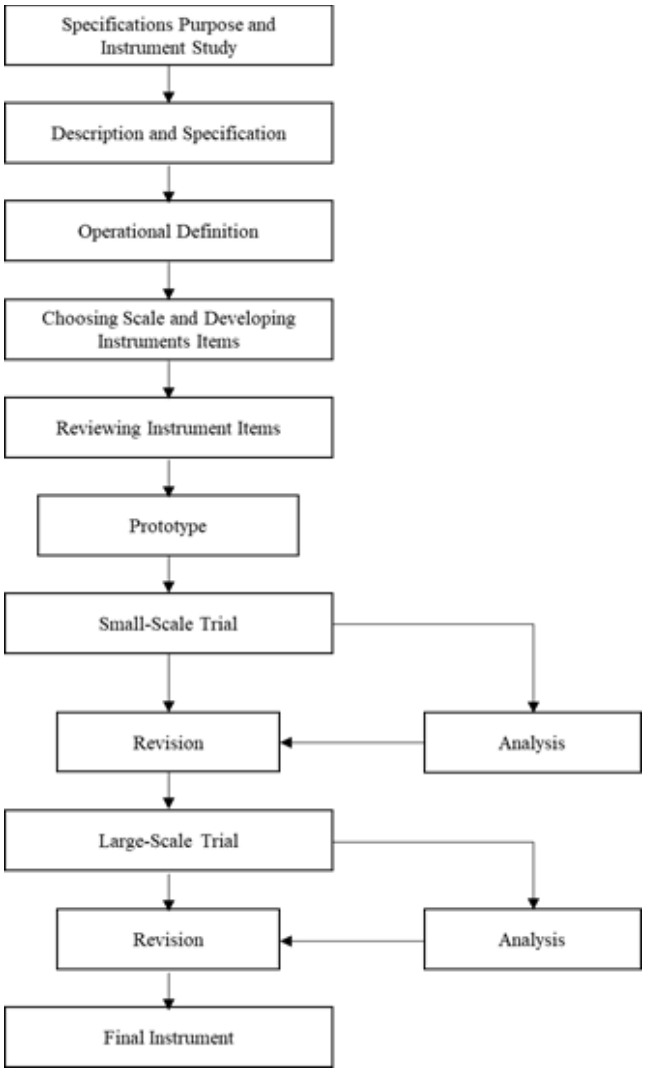

Figure 1. The Stage of Developing the Instrument

The instrument developed has five options with modifications of the Likert scale (Mardapi, 2008; Nurrahman et al., 2022). The score range was 5-4-3-2-1 with 5 (Very Good), 4 (Good), 3 (Enough), 2 (Not Good), and 1 (Not Very Good). Respondents were able to select according to the conditions of the school.

Sample and Sampling Technique

The study's sample included students and vocational high school teachers from the Office Administration program in the Special Region of Yogyakarta Province. Cluster random sampling techniques were used to select districts, schools, and teachers randomly. A total of 85 respondents participated in the small-scale trial stage, while 235 were involved in the wide-scale trial. The trial used an e-form for data collection.

Instrument

The instruments developed in this study were questionnaires. The initial step involved a thorough review of existing literature to define the characteristics of the e-learning evaluation component. Operational definitions were designed to guide the development of instrument indicators aligned with the construct under study. The items underwent review and assessment by four experts using the Delphi method. (Dalkey & Helmer, 1963) which was then calculated using the Aiken V (Aiken, 1985)

An initial online learning evaluation instrument, consisting of 23 items, was developed. This included four items for the system assessment indicator, six items for program planning, four for program implementation, four for the improvement program, and five for the certification program.

Developing instruments was a long and valuable process (Istiyono et al., 2014; Nurrahman et al., 2022), so doing this in detail and with care was necessary. Therefore, researchers conducted a survey and reliability test of instruments made in two vocational schools, especially in the office administration program in Yogyakarta. Researchers analyzed documents and searched for information related to the implementation of e-learning in vocational high schools.

Developing instruments was a meticulous and essential process requiring detailed attention (Istiyono et al., 2014; Nurrahman et al., 2022). Thus, researchers conducted a survey and reliability test of the instruments in two vocational schools specializing in office administration in Yogyakarta. Researchers analyzed documents and collected information related to the implementation of e-learning in vocational high schools.

Data Analyse Technique

The trial results data were then examined, including item validation using the Explanatory Factor Analysis (EFA) technique using the SPSS 22 program and Confirmatory Factor Analysis (CFA) with LISREL 8.80 (Jöreskog & Sörbom, 1993). This leads to getting the number of items that are constructed validly. Then, to measure the level of the instrument developed, the Alpha Cronbach reliability coefficient was used using SPSS 22

RESULTS AND DISCUSSION

Result

The results of this study are instruments designed to evaluate the implementation of e-learning in Vocational High Schools. The result with the Aiken formula showed that items 14 and 20 were rejected because the value of V was only 0.75 and 0.69, respectively, so there are still 21 valid items. In addition, the expert recommended revisions to ensure the developed instruments. The revision aims to obtain valid items and scales to produce consistent and stable values for the long term.

After revising the instrument, the researchers conducted a small-scale trial with 83 respondents. The analysis was conducted in a construct with the EFA. The analysis showed a Kaiser-Meyer-Olkin Sample Sufficiency of Sampling (KMO) score of 0.751. Each item has an anti-image coefficient greater than 0.5, meaning it meets the requirements for factor analysis.

In the larger-scale trials with 235 participants, Confirmatory Factor Analysis (CFA) techniques were used to refine the initial trial results, consistent with Cramer's (2003) approach. The results of the CFA are illustrated in Figure 2, with an Alpha Cronbach reliability coefficient of 0.791 indicating the instrument's reliability. (Feldt & Brennan, 1989; Retnawati, 2016).

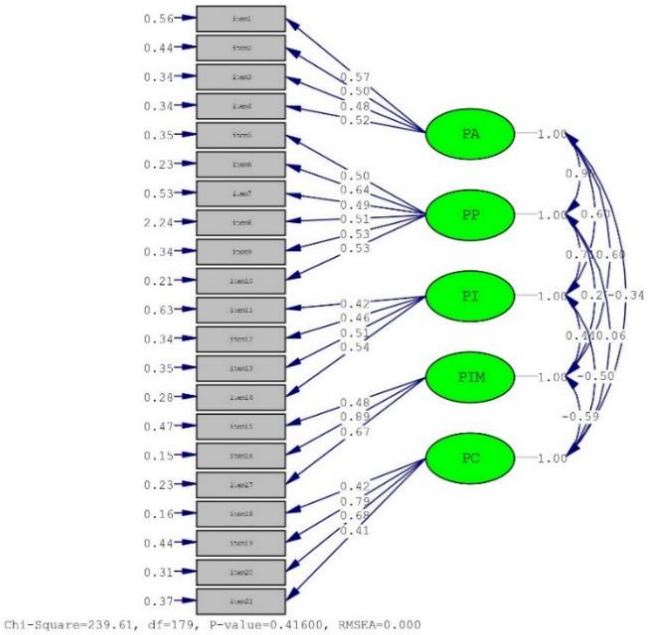

Figure 2. The CFA Analysis Result

Figure 2 shows the results of CFA analysis that Chi-square is more minor than two df (239.61 < 2 x 179, According to Jöreskog & Sörbom (1993), p-value = 0.416 (> 0.05, according to Pedhazur (1997), RSMEA = 0.000 (< 0.08, According to (Ferdinand, 2002). The loading

factor value of each item indicates a value > 0.3, meaning that all items are accepted (Hair et al., 2010). Therefore, it can be concluded that the model developed is fit (Nunnally & B. I. H, 1994).

Discussion

The results analysis shows that the instrument for evaluating the implementation of online learning has content validity, construct validity, and good reliability. The validity of the content aims to assess the instrument based on the item's readability, the item, the relevance of the item, the guidelines, and the item's revision(Azwar, 2016; Mardapi, 2008).

Figure 1 shows that the developed instrument is well-fitted. A fit model implies that the tested model accurately represents a theoretical construct based on field data. This aligns with Mardapi's perspective (Mardapi, 2008) on constructed validity, which shows how well a test instrument reflects the measured theoretical construct or trait developed during instrument preparation. Establishing construct validity is crucial, as it signifies the instrument's high level of validity. (Azwar, 2016; Setiawati et al., 2013).

The developed instrument's reliability coefficient is categorized as "good," indicating its reliability. Reliable instruments are essential for long-term use (Allen & Yen, 1979). Additionally, Nunnally & B. I. H (1994) and Iacobucci et al. (1999) suggest that reliability demonstrates stability, consistency, and reliability in describing indicators as they are.

The final product of this study is an evaluation instrument designed for evaluating the implementation of e-learning in vocational high schools, as shown in Table 1. This evaluation tool is intended to offer recommendations based on the evaluation findings concerning e-learning implementation and serve as a basis for decision-making. This is under the statement (Mardapi, 2017) that evaluation is an activity to collect, analyze, and present information about a particular object that is examined, and the results can be used as consideration material in decision-making. Furthermore, (Divayana, 2017) emphasizes that evaluation activities aim to identify errors or weaknesses based on the assessment results of the object or program evaluated, thereby determining the effectiveness and operational constraints.

Table 1. Online Learning Evaluation Instruments

No	Indicator	Item (Evaluated Aspect)	Loading Factor
1	*System Assessment*	Background of online learning implementation	0,57
		The basis of the legality of e-learning	0,50
		Mechanisms of online-based learning models	0,48
		The mechanism for determining human resources	0,52
2	*Program Planning*	The readiness of teachers' knowledge of online learning	0,50
		The readiness of students' knowledge of online learning	0,64
		Management knowledge readiness	0,49
		The readiness of facilities and infrastructure	0,51
		Online-based learning model planning	0,53
		Online learning budget readiness	0,53
3	Program Implementation	Socialization of the orientation of online learning for the school community	0,42
		Socialization of online learning operations to teachers and students	0,46
		Socialization of the use of critical devices and supporting online learning to the managers	0,51
		Online learning operation	0,54
4	Program Improvement	Online learning budget management	0,48
		Online learning hardware installation	0,89
		Installation of online learning software	0,67
5	Program Certification	The attainment of online learning programs	0,42
		Reliability of online learning systems	0,79
		Quality of the learning process	0,68
		The attainment of assessment and evaluation of learning	0,41

Table 1 shows that instruments developed and used to evaluate online consist of five factors and have 21 items. These items were developed based on theories proposed by experts and aligned with their operational descriptions. Each item formed from five factors also meets the minimum requirements for a loading factor value, namely > 0.3, namely in the range of 0.41 – 0.89. The highest mean loading factor value was for the program improvement factor (0.68), while the lowest was for the program implementation factor (0.48). The developed instrument demonstrates both content validity and high construct validity. In addition, the coefficient level of instrument reliability is categorized as good (Salkind, 2007). Reliability is essential because low reliability can affect the measuring instrument's validity. Instruments that are both valid and reliable are essential for accurately assessing components. Andrian et al. (2018) state that valid and reliable instruments provide comprehensive educational program information.

CONCLUSION

The results analysis shows that the instrument for evaluating the implementation of online learning has content validity, construct validity, and good reliability. The instrument includes five components: System Assessment, Program Planning, Program Implementation, Program Improvement, and Program Certification. The total instrument items created were 21 items. The instrument was validated employing Aiken, construct validation was used for EFA and CFA, and Cronbach Alpha was used for reliability. The developed evaluation instrument is expected to be used by stakeholders to evaluate the effectiveness of e-learning and inform future decision-making processes.

REFERENCES

Aiken. (1985). Three Coefficients for Analyzing the Reliability and Validity of Ratings. *Educational and Psychological Measurement*, *45*(1), 131–142. https://doi.org/https://doi.org/10.1177/001316448545101

Allen, M. J., & Yen, W. M. (1979). Introduction to measurement theory, Monterey, CA: Brooks/Cole, 1979. *Google Scholar*.

Alturki, U., & Aldraiweesh, A. (2021). Application of learning management system (LMS) during the COVID-19 pandemic: A sustainable acceptance model of the expansion technology approach. *Sustainability (Switzerland)*, *13*(19). https://doi.org/10.3390/su131910991

Andrian, D., Kartowagiran, B., & Hadi, S. (2018). The instrument development to evaluate local curriculum in Indonesia. *International Journal of Instruction*, *11*(4). https://doi.org/10.12973/iji.2018.11458a

Anshori, S. (2018). Pemanfaatan Teknologi Informasi Dan Komunikasi Sebagai Media Pembelajaran. *Civic-Culture: Jurnal Ilmu Pendidikan PKn Dan Sosial Budaya*, *9924*.

Ariesta, W., Aina, M., Uslan, Kumbarasari, S., Aminatun, D., & Mishbahuddin. (2021). Evaluation Of Online Learning In Higher Education During The COVID-19 Pandemic : A Review and Recommendations. *Novateur Publication, India*, *June*.

Azwar, S. (2016). Reliabilitas Dan Validitas Aitem. *Buletin Psikologi*, *3*(1).

Chahal, K., & Patel, M. (2021). Features of Learning Management Systems (LMS) for Improving Teaching and Learning. *Journal of Interdisciplinary Cycle Research*, *13*(11).

Cramer, D. (2003). *Advance Quantitative Data Analysis*. McGraw-Hill Education.

Dalkey, N., & Helmer, O. (1963). An Experimental Application of the DELPHI Method to the Use of Experts. *Management Science*, *9*(3). https://doi.org/10.1287/mnsc.9.3.458

Divayana, D. G. H. (2017). Evaluasi Pemanfaatan E-Learning Menggunakan Model CSE-UCLA. *Cakrawala Pendidikan*, *36*(2).

Feldt, L. S., & Brennan, R. L. (1989). Reliability. In R. L. Linn (Ed.). *Educational Measurement*, 105–146.

Ferdinand, A. (2002). *Structural Equation Modelling dalam Peneltian Manajemen.* Badan Penerbit Universitas Diponegoro.

Furqon, M., Sinaga, P., Liliasari, L., & Riza, L. S. (2023). The Impact of Learning Management System (LMS) Usage on Students. *TEM Journal*, *12*(2). https://doi.org/10.18421/TEM122-54

Gao, M., Cui, Y., Chen, H., Zeng, H., Zhu, Z., & Zu, X. (2022). The efficacy and acceptance of online and offline learning in medical student education: a systematic review and meta-analysis. *Journal of Xiangya Medicine*, *7*. https://doi.org/10.21037/jxym-22-3

Giatman, M., Siswati, S., & Basri, I. Y. (2020). Online Learning Quality Control in the Pandemic Covid-19 Era in Indonesia. *Journal of Nonformal Education*, *6*(2).

Gronlund, N. E., & Robert, L. L. (1991). *Educational Assessment and Reporting*. Harcourt Brace Javanovich Publisher.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Multivariate Data Analysis. In *Vectors*. https://doi.org/10.1016/j.ijpharm.2011.02.019

Handarini, O. I., & Wulandari, S. S. (2020). Pembelajaran Daring Sebagai Upaya Study From Home (SFH) Selama Pandemi Covid 19. *Jurnal Pendidikan Administrasi Perkantoran (JPAP)*, *8*(3). https://doi.org/10.26740/jpap.v8n3.p496-503

Hartanto, W. (2016). Penggunaan E-Learning sebagai Media Pembelajaran. *Jurnal Pendidikan Ekonomi*, *10*(1).

Iacobucci, D., Neelamegham, R., & Hopkins, N. (1999). Measurement quality issues in dyadic models of relationships. *Social Networks*, *21*(3). https://doi.org/10.1016/S0378-8733(99)00010-6

Istiyono, E., Mardapi, D., & Suparno, S. (2014). Pengembangan Tes Kemampuan Berpikir Tingkat Tinggi Fisika (PysTHOTS) Peserta Didik SMA. *Jurnal Penelitian Dan Evaluasi Pendidikan*, *18*(1). https://doi.org/10.21831/pep.v18i1.2120

Jöreskog, K. G., & Sörbom, D. (1993). LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language. Scientific Software International. In *Scientific Software*.

Kasim, N. N. M., & Khalid, F. (2016). Choosing the right learning management system (LMS) for the higher education institution context: A systematic review. *International Journal of Emerging Technologies in Learning*, *11*(6). https://doi.org/10.3991/ijet.v11i06.5644

Krome, L. (2021). A review of Zoom utilization in higher education during the COVID-19 pandemic. *Education Thinking*, *1*(8).

Mar'ah, N. K., Rusilowati, A., & Sumarni, W. (2020). Perubahan Proses Pembelajaran Daring Pada Siswa Sekolah Dasar di Tengah Pandemi Covid-19. *Prosiding Seminar Nasional Pascasarjana UNNES*.

Mardapi, D. (2008). *Teknik Penyusunan Instrumen Tes dan Nontes*. Mitra Cendekia Offset.

Mardapi, D. (2017). *Pengukuran, penilaian dan evaluasi pendidikan "Measurement, assessment and evaluation of education*. Penerbitan Parama.

Nunnally, J. C., & B. I. H. (1994). *Psychometric theory (3rd ed.)*. McGraw Hill.

Nurrahman, A., Sukirno, S., Pratiwi, D. S., Iskandar, J., Rahim, A., & Rahmaini, I. S. (2022). Developing Student Social Attitude Self-Assessment Instruments: A Study in Vocational

High School. *Research and Evaluation in Education*, *8*(1). https://doi.org/10.21831/reid.v8i1.45100

Pedhazur, E. J. (1997). Multiple Regression in Behavioral Research; Explanation and Prediction. In *Journal of the American Statistical Association* (Vol. 70, Issue 352).

Purwanto, A., Asbari, M., Prameswari, M., & Ramdan, M. (2020). Gaya Kepemimpinan Di Madrasah Aliyah: Authentic, Tansformational, Authoritarian Atau Transactional? *Nidhomul Haq : Jurnal Manajemen Pendidikan Islam*, *5*(1). https://doi.org/10.31538/ndh.v5i1.544

Retnawati, H. (2016). *Analisis Kuantitatif Instrumen Penelitian (Panduan Peneliti, Mahasiswa dan Psikometri)*. www.nuhamedika.gu.ma

Rohana, S. (2020). Model Pembelajaran Daring Pasca Pandemi COVID-19. *At-Ta'dib: Jurnal Ilmiah Prodi Pendidikan Agama Islam*. https://doi.org/10.47498/tadib.v12i02.441

Salkind, N. J. (2007). *Encyclopedia of Measurement and Statistics*. SAGE.

Setiawati, F. A., Mardapi, D., & Azwar, S. (2013). Penskalaan Teori Klasik Instrumen Multiple Intelligences Tipe Thurstone Dan Likert. *Jurnal Penelitian Dan Evaluasi Pendidikan*, *17*(2). https://doi.org/10.21831/pep.v17i2.1699

Sintawana, N. (Nisya), Lazirkha, D. P. (Diana), & Sari, S. N. (Siti). (2020). Pengaruh Media Pembelajaran Online Berbasis E-learning pada Aplikasi Zenius terhadap Hasil Belajar Siswa SMA. *JI-Tech.*

Stufflebeam & Shinfield. (1985). *Systematic Evaluation*. Kluwer.

Sustiawati, M., & Zakiyah, Z. (2022). Pengaruh Pembelajaran Online Terhadap Hasil Belajar Siswa pada Pembelajaran Pendidikan Agama Islam. *Proceedings Series on Social Sciences & Humanities*, *4*. https://doi.org/10.30595/pssh.v4i.291

Tanuwijaya, N. S., & Tambunan, W. (2021). Alternatif Solusi Model Pembelajaran untuk Mengatasi Resiko Penurunan Capaian Belajar dalam Pembelajaram Tatap Muka Terbatas di Masa Pandemic Covid 19 (Studi Kasus Analisis Kebijakan Pendidikan). *Jurnal Manajemen Pendidikan*, *10*(02).

Tena, M. J. F., del Carmen Ortega Navas, M., & Fuster, M. C. S. (2021). New technologies as innovative teaching-learning strategies in the Digital Era. *Revista Electronica Interuniversitaria de Formacion Del Profesorado*, *24*(1). https://doi.org/10.6018/REIFOP.406051

Yanto, B., & Retnawati, H. (2018). Dapatkah Model Blended Learning Mempengaruhi Kemandirian Belajar Matematika Siswa? *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *7*(3). https://doi.org/10.24127/ajpm.v7i3.1559

Yuliana, D. P. (2022). Efektivitas Penggunaan Google Meet Sebagai Media Pembelajaran Daring Selama Pandemi COVID-19. *Jurnal Pendidikan Teknologi Informasi (JUKANTI)*, *5*(1). https://doi.org/10.37792/jukanti.v5i1.378