Vol. 13, No. 3, pp. 1343-1353, 2023 DOI: 10.23960/jpp.v13.i3.202333

Jurnal Pendidikan Progresif

e-ISSN: 2550-1313 | p-ISSN: 2087-9849

http://jurnal.fkip.unila.ac.id/index.php/jpp/

Difficulties in Printed Modular Distance Learning: Scale Development and Psychometric Properties

Glenn Medallon Calaguas[1*], Noel Calma Manarang[2], Aina Pangan Cortez[2], & Riza Manalo Mercado[2]

[1]Faculty- College of Education, Pampanga State Agricultural University, Philippines

[2] Graduate Students- College of Education, Pampanga State Agricultural University, Philippines

*Corresponding email: glenn_calaguas@psau.edu.ph

Received: 25 November 2023 Accepted: 24 December 2023 Published: 27 December 2023

Abstract: This study focused on the development of a scale that can be used to identify difficulties in printed modular distance learning from the perspective of learners. Extant literature was analyzed, and 20 learners were interviewed aimed at identifying difficulties. Insights from both literature and interviews served as the basis for the writing of 23 items on the initial scale, distributed under seven themes. Ten learners were asked to participate in the trial run, and 619 learners participated in the test administration. With responses during the test administration, means and standard deviations were computed, and scale reliability was evaluated using Cronbach's Coefficient Alpha formula, while factor analysis was used to evaluate scale validity. Six factors were retained after factor analysis. The scale developed is psychometrically sound and can identify difficulties in printed modular distance learning, as can be observed from the results of its reliability and validity evaluation.

Keywords: difficulties, distance learning, modular learning, scale development.

Abstrak: *Penelitian ini berfokus pada pengembangan skala yang dapat digunakan untuk mengidentifikasi kesulitan dalam pembelajaran jarak jauh modular cetak dari sudut pandang peserta didik. Literatur yang ada dianalisis, dan 20 peserta didik diwawancarai dengan tujuan untuk mengidentifikasi kesulitan. Wawasan dari literatur dan wawancara menjadi dasar penulisan 23 item pada skala awal, yang didistribusikan dalam tujuh tema. Sepuluh peserta didik diminta untuk berpartisipasi dalam uji coba, dan 619 peserta didik berpartisipasi dalam administrasi survei. Dengan respon selama pelaksanaan tes, rata-rata dan deviasi standar dihitung, dan reliabilitas skala dievaluasi menggunakan Koefisien Alpha Cronbach, sedangkan analisis faktor digunakan untuk mengevaluasi validitas skala. Enam faktor dipertahankan setelah analisis faktor. Skala yang dikembangkan secara psikometrik berkategori baik dan dapat mengidentifikasi kesulitan dalam pembelajaran jarak jauh modular tercetak, terlihat dari hasil evaluasi reliabilitas dan validitasnya.*

Kata kunci: *pembelajaran jarak jauh, pembelajaran modular, pengembangan skala pengukuran.*

To cite this article:

Calaguas, G. M., Manaran, N. C., Cortez, A. P. & Mercado, R. M. (2023). Difficulties in Printed Modular Distance Learning: Scale Development and Psychometric Properties. *Jurnal Pendidikan Progresif*, *13*(3), 1343-1353. doi: 10.23960/jpp.v13.i3.202333.

INTRODUCTION

Schools during the COVID-19 pandemic were forced to consider other modalities to ensure learning continuity, and one of these is distance learning (DLM). DLM refers to a modality of learning delivery where learning takes place while teachers and learners are geographically separated. There are three approaches to this modality: modular distance learning (MDL), online distance learning, and TV/radio-based instruction (Paco et al., 2021).

Specifically, MDL involves individualized instruction, which allows learners to use self-learning modules (SLMs) either in print or digital format (electronic copy), depending on the learner's context (Rodriguez, 2022). These modules may include sections on motivation and evaluation. These sections serve as a guide to desired skills for both teachers and learners. Leaners' progress is monitored via home visits and feedback mechanisms. Guidance is provided to those requiring special attention (Paco at al., 2021).

Taking into consideration the Philippine context, printed modular distance learning (PMDL) was widely used in the country during the COVID-19 pandemic. The PMDL modality is believed to provide equal access to quality and relevant education to learners; thus, it was extensively used by the Department of Education (DepEd) as an Alternative Delivery Mode (ADM) to continue with the delivery of quality and relevant education. To be specific, the DepEd, through its Learning Resource Management and Development Services (LRMDS), provided links where schools could access and download modules for printing. Learners were then provided with a prescribed number of printed modules to be completed at home (Talimodao & Madrigal, 2021). These printed modules contain varied tasks and learning activities that are based on essential learning competencies (Anzaldo, 2021).

Additionally, teachers are given the responsibility of monitoring the progress of learners. Assistance from the teacher can be sought either via e-mail, telephone, text message, or instant messaging. Whenever possible, teachers conduct home visits to assist learners needing remediation. Any family members or someone from the community may act as para-teachers (Rodriguez, 2022). The desire to ensure education continuity in the Philippines despite lockdowns and community quarantines is captured in the "New Normal Educational Policy" (Salamuddin, 2021). Schools are responsible for the preparation and distribution of learning materials, and parents assist in the supervision of learning while learners stay at home to complete required tasks (Pascual, 2021).

On one hand, the advantages of PMDL, to name some, include the encouragement of family bonding and independent learning and its cost-effectiveness (Dargo & Dimas, 2021). It has enabled the old but worthy parent-child partnership in education. It brought back the tradition where parents or guardians sit with their children and talk about their studies and accomplish their assignments (Paco, et al., 2021). With this set-up, parents and guardians play a more significant role (Tingsona & Aquino, 2021).

On the other hand, it must be noted that the significant changes in the education system, particularly in the modality of the teaching-learning process, have also brought challenges to teachers, learners, and parents. The shift from the usual face-to-face to PMDL has been considered challenging (Paco et al., 2021). The shift placed both teachers and learners less prepared, and sometimes unprepared (Cabardo et al., 2022). And just like in any transition, this is, of course, expected. Difficulties identified based on extant literature were: difficulty in learning independently (Bayucca, 2021; Gueta & Janer, 2021; Palad, 2022), time management (Ariza & Ariza, 2021; De Claro, 2021; Ecang & Petalla, 2022; Gueta

& Janer, 2021), motivation (Caslib & Decano, 2021; Gueta & Janer, 2021), lack of self-discipline (Bordeos, 2021) and strict daily routine (Caslib & Decano, 2021), lack of learning resources (Ariza & Ariza, 2021; Bayucca, 2021; Bustillo & Aguilos, 2022; Caslib & Decano, 2021; Ecang & Petalla, 2022), limited guidance and support from parents (Bayucca, 2021; Cabardo et al., 2022; Caslib & Decano, 2021) and interaction from teachers (Ariza & Ariza, 2021; Bayucca, 2021; Bordeos, 2021; Caslib & Decano, 2021; Dargo & Dimas, 2021), additional workload to parents (Dargo & Dimas, 2021), lack of interactions with classmates (Ariza & Ariza, 2021; Bordeos, 2021; Dargo & Dimas, 2021), challenges in internet accessibility (Bayucca, 2021; Bustillo & Aguilos, 2022; Tupas & Linas-Laguda, 2020) and digital divide (Ecang & Petalla, 2022; Tupas & Linas-Laguda, 2020), difficulty understanding the content (Ariza & Ariza, 2021; Bayucca, 2021; Bustillo & Aguilos, 2022; Caslib & Decano, 2021; Gueta & Janer, 2021), health and psychological issues (Bustillo & Aguilos, 2022; Ecang & Petalla, 2022), poor learning conditions at home (Bordeos, 2021; Bustillo & Aguilos, 2022; Dargo & Dimas, 2021), too many activities in the modules (Bustillo & Aguilos, 2022; Dargo & Dimas, 2021), and adapting to the newness (Ecang & Petalla, 2022).

In the end, it must be noted that despite the many challenges, PMDL is still favorable to being re-implemented in the upcoming academic years as a form of distant learning or even as a supplement to in-person instruction. (Talimodao & Madrigal, 2021). It may also be implemented when attending face-to-face classes is not a viable option. However, it is important to identify difficulties experienced in the past, specifically from the experiences of learners during the height of the COVID-19 pandemic, to ensure smooth and effective implementation in the future. This is the main contribution of the study at hand, a developed and validated scale that can measure such difficulties. This scale can serve as an objective checklist that can be used to identify concerns among learners so that sound interventions can be developed.

METHODS

Participants

A total of 649 learners were tapped in the conduct of the study. All of these learners were enrolled in government schools during the school year 2021 to 2022 where PMDL was primarily used because of on-going community quarantines. Twenty learners were interviewed, while 10 learners participated during the trial run. Six hundred nineteen learners answered the initial scale. This group of 619 learners consisted of 406 female and 213 male learners. Their mean age was 15.34, with a standard deviation of 1.20.

Research Design

A mixed-methods research design was used in the study. It is a type of research that combines elements of both qualitative and quantitative research approaches (Schoonenboom & Johnson, 2017). In the case of the study, the content domain from literature and interviews represented the qualitative part, while analyses of responses from the test administration represented the quantitative part. Means, together with standard deviations, reliability, and validity analyses, were all performed.

Procedures

The initial steps in test development and validation were followed in this study. These steps were: (a) search for content domain; (b) item-writing; (c) trial run; (d) administration of the initial scale; (e) descriptive statistics; (f) evaluation of reliability; (g) evaluation of validity; and (h) development of the final scale.

To be specific, extant literature together with the interview of 20 learners on difficulties

experienced in the implementation of PMDL were used as the content domain that served as a guide in developing and writing the items on the initial scale. A total of 23 items, distributed under seven themes, were written for the initial scale. These seven themes, together with the number of items, were: time management (TM): three items; parents'/guardians' assistance (PGA): three items; teachers' assistance (TA): five items; online access (OA): three items; learning environment (LE): three items; social engagement (SE): three items; and learning materials (LM): three items. Ten learners were asked to participate during the trial run. During this stage, it was examined whether the wording used in the items was appropriate and whether the instructions for completing the scale were clear. Six hundred nineteen learners answered the initial scale. With the responses of 619 learners, the means and standard deviations of the items on the initial scale were calculated. The Cronbach's Coefficient Alpha formula was used to evaluate the scale's reliability, while factor analysis (FA) was used to evaluate the scale's validity. The development of the final scale was based on validity and reliability assessments.

Data Analysis

Means and standard deviations serve as guides for the scale's item selection. The scale's reliability was evaluated using the Cronbach's Coefficient Alpha formula. It must be noted that the reliability of multiple-question surveys using the Likert scale is tested using Cronbach's alpha, also known as the coefficient alpha, which assesses reliability or internal consistency (Glen, 2023a). FA, specifically exploratory factor analysis with principal components analysis (PCA) and varimax rotation (with Kaiser normalization), was used to evaluate the scale's validity. The cut-off was set at .50 correlation coefficient.

RESULTS AND DISCUSSION

The purpose of the study was to develop and initially validate a scale for the difficulties encountered by learners in the PMDL modality. Following this purpose, the study started with a review of the extant literature on difficulties in the PMDL modality. Twenty learners were also interviewed. This led to the writing of 23 items on the initial scale divided into seven themes. A trial-run followed with 10 learners. During the trial-run, it was examined whether the wording used in the items was appropriate and whether the instructions for completing the scale were clear. The administration of the initial scale was performed to establish its initial psychometric properties among 619 learners.

Descriptive Statistics

With the responses of the 619 learners as bases, the means and standard deviations of the 23 items in the initial scale were computed. Every time data are evaluated, descriptive statistics are used initially, and the most popular ones are means and standard deviations (Salkind, 2007).

The means and standard deviations of the items give a sense of which items will be useful and which won't. When an item's variance is low, there isn't much variation present, and the item could not be of much utility. Even though it is uncommon in most research applications to investigate item level descriptive statistics, doing so is an essential initial step in developing and validating tests (Kline, 2005). Table 1 presents the descriptive statistics of the 23 items in the initial scale while tables 2 and 3 present five items with the highest and lowest means.

Table 1. Descriptive statistics of items in the initial scale

	N	M	SD	Min.	Max.
TM_1. I have difficulty managing my time in answering modules.	619	2.87	0.69	1.00	4.00
TM_2. I have difficulty beating deadlines.	619	2.76	0.76	1.00	4.00
TM_3. I have difficulty submitting assigned task on time.	619	2.66	0.77	1.00	4.00
PGA_4. I do not have parents/guardians who provides academic support.	619	1.94	0.80	1.00	4.00
PGA_5. I do not have parents/guardians who provides financial support.	619	1.84	0.76	1.00	4.00
PGA_6. I do not have parents/guardians who provides time.	619	2.01	0.81	1.00	4.00
TA_7. I do not have teachers to discuss the lessons with.	619	2.35	0.86	1.00	4.00
TA_8. I do not have teachers who provide instructions.	619	2.06	0.76	1.00	4.00
TA_9. I do not have teachers who explain the topics.	619	2.31	0.86	1.00	4.00
TA_10. I do not have teachers who provide supplementary materials/references.	619	2.24	0.78	1.00	4.00
TA_11. I do not have teachers who answer my questions.	619	2.05	0.75	1.00	4.00
OA_12. I have difficulties in understanding the lessons due to limited access to online resources.	619	2.79	0.75	1.00	4.00
OA_13. I have poor internet connectivity.	619	2.84	0.82	1.00	4.00
OA_14. I have no device in accessing online resources.	619	2.21	0.76	1.00	4.00
LE_15. I have noisy neighbors.	619	2.77	0.87	1.00	4.00
LE_16. I have siblings distracting my studies.	619	2.46	0.89	1.00	4.00
LE_17. I have insufficient space for learning.	619	2.46	0.82	1.00	4.00
SE_18. I do not have classmates to discuss the topics with.	619	2.42	0.77	1.00	4.00
SE_19. I do not have the opportunity to learn with my classmates.	619	2.63	0.80	1.00	4.00
SE_20. I cannot not learn independently.	619	2.36	0.78	1.00	4.00
LM_21. I cannot understand the content of the learning materials.	619	2.41	0.69	1.00	4.00
LM_22. I cannot understand the instructions in the learning materials.	619	2.31	0.67	1.00	4.00
LM_23. I cannot read the text of the learning materials because of printing quality.	619	2.42	0.74	1.00	4.00

As can be gleaned from the table, the means of the items in the initial scale ranged from 1.84 to 2.87 while the standard deviations of the items ranged from 0.67 to 0.89. The importance of this information in the scale's validation may be seen in the fact that the item will perform better the more variable it is and the more its mean lies in the middle of the distribution (Kline, 2005).

Table 2. Items with the highest means

	N	M	SD	Min	Max.
TM_1. I have difficulty managing my time in answering modules.	619	2.87	0.69	1.00	4.00
OA_13. I have poor internet connectivity.	619	2.84	0.82	1.00	4.00
OA_12. I have difficulties in understanding the lessons due to limited access to online resources.	619	2.79	0.75	1.00	4.00
LE_15. I have noisy neighbors.	619	2.767	0.87	1.00	4.00
TM_2. I have difficulty beating deadlines.	619	2.763	0.76	1.00	4.00

Table 3. Items with the lowest means

	N	M	SD	Min	Max.
PGA_5. I do not have parents/guardians who provides financial support.	619	1.84	0.76	1.00	4.00
PGA_4. I do not have parents/guardians who provides academic support.	619	1.94	0.80	1.00	4.00
PGA_6. I do not have parents/guardians who provides time.	619	2.01	0.81	1.00	4.00
TA_11. I do not have teachers who answer my questions.	619	2.05	0.75	1.00	4.00
TA_8. I do not have teachers who provide instructions.	619	2.06	0.76	1.00	4.00

As can be observed from the table, items with the highest means had something to do with time management, internet connectivity, and noisy neighbor concerns. In contrast, as can be seen on the table, items with the lowest means had something to do with parents/guardians' and teachers' assistance. These items had something to do with people expected to contribute to the learners' education.

Evaluation of Reliability

Along with the descriptive properties of the 23 items that made up the initial scale, an internal consistency analysis was done to see how each of the 23 items might improve the scale's reliability. This is presented in Table 4.

As can be seen on the table, Cronbach's á will remain at the 0.80 level regardless of the item to be removed. This is a reflection of the scale's

Table 4. Individual item reliability statistics

	If item dropped
	Cronbach's α
TM_1. I have difficulty in managing my time in answering modules.	0.89
TM_2. I have difficulty beating deadlines in answering modules.	0.89
TM_3. I have difficulty submitting the assigned task on time.	0.89
PGA_4. I do not have parents/guardians who provides academic support.	0.89
PGA_5. I do not have parents/guardians who provides financial support.	0.89
PGA_6. I do not have parents/guardians who provides time.	0.89
TA_7. I do not have teachers to discuss the lesson with.	0.89
TA_8. I do not have teachers to provide the instruction.	0.89
TA_9. I do not have teachers to explain the topics.	0.88
TA_10. I do not have teachers to provide supplementary materials/references.	0.89
TA_11. I do not have teachers to answer my questions.	0.89
OA_12. I have difficulties in understanding the lessons due to limited access to online resources.	0.89
OA_13. I have poor internet connectivity.	0.89
OA_14. I have no device in accessing online resources.	0.89
LE_15. I have noisy neighbors.	0.89
LE_16. I have siblings distracting my studies.	0.89
LE_17. I have insufficient space for learning.	0.89
SE_18. I do not have classmates to discuss the topics with.	0.89

SE_19. I do not have the opportunity to learn with my classmates.	0.89
SE_20. I do not learn independently.	0.89
LM_21. I cannot understand the content of the learning materials.	0.89
LM_22. I cannot understand the instructions of the learning materials.	0.89
LM_23. I cannot read the text of the learning materials because of the printing quality.	0.89

ability to consistently measure a unidimensional construct, even in its initial form.

Evaluation of validity

To evaluate the validity of the scale, Principal Components Analysis (PCA) with Varimax Rotation (Kaiser Normalization) was used. To improve and strengthen a questionnaire, item or subscale analysis using PCA is employed (Brown, 2010). However, the Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy were carried out before factor analysis.

The KMO Test evaluates the data's suitability for factor analysis. As a result, values between 0.80 and 1.00 denote appropriate sampling (Glen, 2023b) while small values (less than 0.05) of the significance threshold signal that a factor analysis may be beneficial with the data, and the Bartlett's Test of Sphericity examines the hypothesis that the correlation matrix is an identity matrix (IBM, 2014). For this study, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy registered 0.88 while Bartlett's Test of Sphericity registered an approximate chi-square of 6354.53 (df = 253.00, Sig. < .00). Such values are strong indications that the sampling was indeed adequate and could be run through factor analysis.

Six factors were identified after factor analysis. The cut-off was item loading of 0.50 correlation coefficients and above. Another basis for the determination of the number of factors is that of the scree plot, as seen in Figure 1. The items that loaded on each factor were also further analyzed. The identified factors, together with items, their factor loadings, and uniqueness, are presented in Table 5. It must be noted that uniqueness was presented because it provided information regarding the proportion of common variance of a specific variable that is not associated with or shared with other variables.

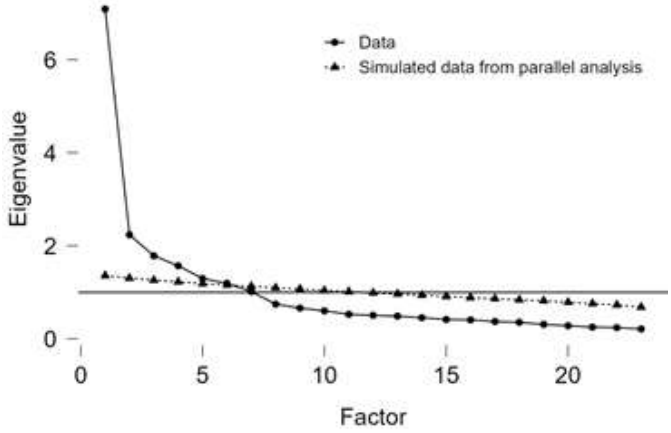

Figure 1. Scree plot

Table 5. Factor loadings

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Uniqueness
TA_8. I do not have teachers to provide the instruction.	0.80						0.28
TA_9. I do not have teachers to explain the topics.	0.79						0.28
TA_7. I do not have teachers to discuss the lesson with.	0.77						0.34
TA_11. I do not have teachers to answer my questions.	0.74						0.36
TA_10. I do not have teachers to provide supplementary materials/references.	0.71						0.42
PGA_5. I do not have parents/guardians who provides financial support.		0.81					0.27
PGA_4. I do not have parents/guardians who provides academic support.		0.81					0.25
PGA_6. I do not have parents/guardians who provides time.		0.77					0.31
LE_17. I have insufficient space for learning.			0.66				0.43
LE_16. I have siblings distracting my studies.			0.60				0.60
LE_15. I have noisy neighbors.			0.59				0.62
LM_21. I cannot understand the content of the learning materials.				0.66			0.36
LM_22. I cannot understand the instructions of the learning materials.				0.66			0.42
TM_2. I have difficulty beating deadlines in answering modules.					0.84		0.27
TM_1. I have difficulty in managing my time in answering modules.					0.62		0.54
TM_3. I have difficulty submitting the assigned task on time.					0.60		0.54
SE_18. I do not have classmates to discuss the topics with.						0.73	0.34
SE_19. I do not have the opportunity to learn with my classmates.						0.71	0.39

Development of the final scale

The items to be included in the final scale were ultimately decided after assessing the descriptive statistics (item means and standard deviations), reliability (Cronbach's alpha formula), and validity (PCA with Varimax Rotation). Eighteen of the original 23 items on the scale were kept. The 18 items kept were the ones that scored highly on the six noted factors: teachers' assistance, parents'/ guardians' assistance, learning environment, learning materials, time management, and social engagement. Table 6 presents the psychometric properties of the final scale and its subscales.

Table 6. Psychometric properties of the final scale and its subscales

	Number of Items	Range of Factor Loadings	Alpha
Teachers' Assistance	5	0.71-0.80	0.90
Parents'/Guardians' Assistance	3	0.77-0.81	0.88
Learning Environment	3	0.59-0.66	0.73
Learning Materials	2	0.66-0.66	0.79
Time Management	3	0.60-0.84	0.77
Social Engagement	2	0.71-0.73	0.80
Final Scale	18	056-0.84	0.88

Table 6 reveals that while the final scale's Alpha was at 0.88, showing a high level of internal consistency, the Alpha of its subscales ranged from 0.73 to 0.90. It must be noted that even though two factors only had two items each, upon assessing the internal consistency of said factors, both had Cronbach's alpha values of 0.79 and 0.80. Also, upon examining their factor loadings, items in said factors met the threshold set in the study, which was 0.50. As a result, the final scale (which ranges from 0.56 to 0.84 factor loadings based on the 0.50 cut-off for item screening) is reliable and valid. The final scale can be used as an honest tool to pinpoint learners' PMDL challenges. The scale (see Appendix A) is known as the "Difficulties in Printed Modular Distance Learning Scale (DPMDLS)" for recognition purposes.

CONCLUSIONS

DPMDLS is a psychometrically-sound scale that can identify difficulties in PMDL. This is demonstrated by the reliability evaluation's (Cronbach's alpha value of 0.88 demonstrating high internal consistency) and validity evaluation's (factor loadings ranging from 0.59 to 0.84 based on the 0.50 cut-off for item screening) results.

As part of the process of determining its psychometric qualities, the DPMDLS has undergone preliminary testing of its validity (PCA with Varimax Rotation) and reliability (Cronbach's Coefficient Alpha formula). Further research is still advised in order to understand the DPMDLS's exact properties. To further verify its validity and reliability, it must be examined again in order to identify redundant items.

REFERENCES

Anzaldo, G. D. (2021). Modular distance learning in the new normal education amidst Covid-19. *International Journal of Scientific Advances, 2*(3), 263-266. https://doi.org/10.51542/ijscia.v2i3.6

Ariza, V. S. & Ariza, J. S. (2021). Lived experiences of students in remote area in the new normal. *International Journal of Scientific Advances, 2-6*, 995-999. https://doi.org/10.51542/ijscia.v2i6.13

Bayucca, S. A. (2021). Challenges encountered and technical assistance needed by parents and learners utilizing modular distance learning: Basis for a proposed support program. *Journal of Humanities and Social Sciences, 3*(3), 128-135.

Bordeos, M. L. (2021). Learning goes on: Students' attitudes and perceptions in the implementation of the modular distance learning during covid 19 pandemic. *Instabright International Journal of Multidisciplinary Research, 3*(1), 7-16. https://doi.org/10.52877/instabright.003.01.0043

Brown, J. D. (2010). How are PCA and EFA used in language test and questionnaire

development? *SHIKEN: JALT Testing & Evaluation SIG Newsletter, 14*(2), 30-35.

Bustillo, E. & Aguilos, M. (2022). The challenges of modular learning in the wake of COVID-19: A digital divide in the Philippine countryside revealed. *Educ. Sci., 12*, 449. https://doi.org/10.3390/ educsci12070449

Cabardo, J. R. O, Cabardo, C. J. O & Cabardo-Mabida, S. J. O. (2022). Challenges and mechanisms of teachers in the implementation of modular distance learning in the Philippines: A phenomenological study. *International Journal of Interdisciplinary Studies, 3*(1), 169-182 https://doi.org/10/51798/ sijis.v3il.223

Caslib, M. P. & Decano, R. S. (2021). Students' personal stories: Modular distance learning first experiences in the new normal. *International Journal of Research and Innovation in Social Science, 5*(11), 12-16.

Dargo, J. M. & Dimas, M. (2021). Modular Distance Learning: Its effect in the academic performance of learners in the new normal. *Journal of Education, Teaching, and Learning, 6*(2), 204-208.

De Claro, W. N. D. (2021). Challenges and barriers encountered by G10- Agoncillo learners in the implementation of modular distance learning at Taal National High School. *International Journal of Research in Engineering, Science and Management, 4*(7), 409-413.

Ecang, V. S. S. & Petalla, M. B. (2022). A metamorphic experience of students-at-risk-of-dropping-out in the printed modular distance learning in time of COVID-19 pandemic. *Philippine Social Science Journal, 5*(1), 49-56. https://doi.org/ 10.52006/main.v5i1.470

Glen, S. (2023a). Cronbach's Alpha: Simple definition, use and interpretation. StatisticsHowTo.com: Elementary Statistics for the rest of us! https:// www.statisticshowto.com/probability-and-statistics/statistics-definitions/ cronbachs-alpha-spss/.

Glen, S. (2023b). Kaiser-Meyer-Olkin (KMO) test for sampling adequacy. StatisticsHowTo.com: Elementary Statistics for the rest of us! https:// www.statisticshowto.com/kaiser-meyer-olkin/

Gueta, M. F. & Janer, S. S. (2021). Distance learning challenges on the use of self-learning Module. *United International Journal for Research and Technology, 2*(7), 58-71.

Kline, T. J. B. (2005). Psychological testing. A practical approach to design and evaluation. SAGE Publications Inc.

Paco, D. S., Yazon, A. D., Manaig, K. A., Sapin, S. B., Bandoy, M. M. (2021). Paint a portrait: Lived experience of parents in the implementation of modular distance learning. *International Journal of Research in STEM Education, 3*(2), 37-50. DOI: https://doi.org/10.31098/ ijrse.v3i2.623

Palad, I. A. (2022). Exploring stakeholders experiences and challenges on the printed modular distance learning modality amidst the COVID-19 pandemic. *Journal of Applied Management, 20* (1), 25-33. http://dx.doi.org/ 10.21776/ ub.jam.2022.020. 01.03

Pascual, E. A. (2021). Parent-teacher-learner collaboration in modular distance learning. *International Journal of Research Publication, 83*(1), 189-2022. http:// doi:.10.47119/IJRP100831820212196

Rodriguez, D. L. (2022). Modular distance learning: The problem and its background. *Instabright International Journal of Multidisciplinary Research, 4*(2), 101-107. 10.52877/instabright.004.01.0110

Salamuddin, A. A. (2021). Comparative analysis of students' perceptions in modular distance learning approach versus face-to-face learning approach of Mindanao State University-Sulu. *Open Access Indonesia Journal of Social Sciences, 4*(4), 395-407.

Salkind, N. J. (2007). Statistics for people who think they hate statistics (The Excel Edition). SAGE Publications, Inc.

Schoonenboom, J., & Johnson, R. B. (2017). How to construct a mixed methods research design. *Kolner Zeitschrift fur Soziologie und Sozialpsychologie*, *69*(Suppl 2), 107–131. https://doi.org/10.1007/s11577-017-0454-1

Talimodao, A. J. S., & Madrigal, D. V. (2021). Printed modular distance learning in Philippine public elementary schools in time of COVID-19 pandemic: Quality, implementation, and challenges. *Philippine Social Science Journal, 4*(3), 19-29. https://doi.org/10.52006/main.v4i3.391

Tingsona, J. A. & Aquino, J. M. (2021). Addressing reading comprehension difficulties in printed modular distance learning: A case study. *International Journal of English Language Studies*, 1-6. https://doi.org/10.32996/ijels.2021.3.10.1

Tupas, F. P. & Linas-Laguda, M. (2020). Blended learning – an approach in Philippine basic education curriculum in new normal: A review of current literature. *Universal Journal of Educational Research 8*(11), 5505-5512. https://doi.org/10.13189/ujer.2020.081154