

Validation of Supplemental E-Book as Alternative Delivery Mode in Teaching Mathematics for Grade 6 Pupils

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ABSTRACT

This study aimed to develop and validate the degree to how pupils, teachers, and experts within the Eastern Samar Division used the e-book as an alternative delivery mode material in teaching. Hence, this ascertained the acceptability and usability of e-books for academic use among Grade 6 learners and teachers in the Eastern Samar Division for the school year 2023-2024. This study utilized the correlational, it is a correlation design because all information will be gathered about the relationship of the reading competencies, validity, and effectiveness of the supplemental e-book as an alternative delivery mode. There are two instruments used in the study, level of validity of the developed e-Book and level of

acceptability the developed e-Book. The results Show the relationship between the level of validity and level of acceptability of a developed e-book. Summated mean scores of each of the factors were correlated in order to ascertain the degree and magnitude of association. However, by looking at the data, it is revealed that none among the variables has exhibited linear relationship. This mean that the level of acceptability of the developed e-book is not influenced by the level of validity.

Keywords: *validation, correlation, acceptability, development, correlation.*

INTRODUCTION

Reading among learners is a vital aspect of their learning process and should be encouraged, any effort or innovation that improves the reading motivation is worth sustaining. In this technologically-driven environment, the integration of technology in the teaching-learning process provides teachers with a great opportunity to enrich the skills of 21st century learners (Robles & Acedo, 2019). Unfortunately, it is apparent that with the move of the K-12 curriculum, public schools in the Philippines have limited instructional materials that will meet the growing diverse learning needs of the millennial (Llagas et al., 2016). Unfavorably, the 2018 results of the Programmed for International Students Assessment (PISA) revealed that the Philippines ranked below average in Mathematics, Science and Reading, with an overall ranking just one notch above the last in the list (OECD 2019).

In response to these, the Philippine government through the Department of Education established a program to cope up with learning through the "Public Schools of the Future Digital Rise Program" (DepEd Common, 2020). This program is aligned with the Learning Continuity Plan of the department to make teaching and learning accessible anytime and anywhere, in whatever situation or environment in the new

normal. Additionally, it responds to the demands of the times, and to prepare and equip learners with the needed digital literacy skills, the department envisioned an online learning platform tailor-made to the requirement of a good e-learning modality.

This e-learning modality is very necessary because the learning process can occur anywhere and anytime. In addition to the development of increasingly sophisticated smartphones, learners can learn the materials they want quickly. E-Books are very popular learning media that learners use today. The increasing popularity of e-Books began with the spread of mobile reader devices that can facilitate the reading of digital books at the end of the first decade of the twenty-first century (Sehn & Fragoso, 2015). According to Santoso, Siswandari, & Sawiji, (2018), e-books as transformations from traditional books to digital forms make it easy for students to search for available information. Koh & Herring (2016) e-books have a variety of advantages over current printed books. They are easy to access, do not need to go to the library, the easy topic search can be accessed anywhere and anytime, the display is better, cheaper, and saves space deviation. Yachina, Valeeva, & Sirazeeva (2016) added that the characteristic feature of the use of electronic teaching materials compared to traditional methods of education is to provide information not only in the form of text but also through audiovisuals to enable students to focus on learning and contribute to better understanding and storage of information.

Those previous studies mainly discussed the development of e-book in various subjects' areas. However, the development of e-book in language teaching especially in the reading subject seems to have not been conducted yet. Therefore, the gap of the current study is that developing an e-book for the intermediate reading subject in a K-3 setting. Besides, the learners' perceptions toward the use of e-book will be measured as well.

The development of the e-book of this study is expected to contribute positively both theoretical; to enrich the treasure of related studies and practical; as the electronic learning material which can be used in teaching reading in the digital era. In addition, after having gotten the final product of this e-book, the researcher used it in pre-intermediate reading material for classroom instruction as the trial. Then, will be administered a questionnaire to measure the learners' observation toward the use of the e-book.

This study intends to address the above-mentioned gaps or challenges. With this premise, the study focuses to develop and validate supplemental e-book as alternative delivery mode, which were congruent with the K-3 competencies in reading and learning continuity plan. It focuses on its applicability and its effectiveness in addressing the learning needs of 21st-century learners. More importantly, this study is considered as an essential initiative since the utilization of such materials can increase learners' engagement, enabling them to become active learners, eager to increase knowledge or skill acquisition they ought to master. However, rapid technological development cannot necessarily be followed in all parts of Eastern Samar. Although the recent popularity of e-book utilization in academic work, it is yet to be fully established in the province of Eastern Samar as a learning material due to limited access to e-reading devices. This study aimed to develop and validate the degree to how pupils, teachers, and experts within the Eastern Samar Division used the e-book as an alternative delivery mode material in teaching. Hence, this ascertained the acceptability and usability of e-books for academic use among Grade 6 learners and teachers in the Eastern Samar Division for the school year 2023-2024.

Objective of the Study

This study aimed to contribute to the body of knowledge on the effectiveness of e-Book as alternative delivery mode in teaching Mathematics for Grade 6 pupils. Specifically, it sought answers to the following questions:

1. What is the level of validity of the supplemental e-book as an alternative delivery mode considering the following:
 - 1.1 Format
 - 1.2 Language

- 1.3 Content
- 1.4 Evaluation
- 2. What is the level of acceptability of the supplemental e-book as an alternative delivery mode in terms of:
 - 2.1 Learning competencies
 - 2.2 Appropriateness
 - 2.3 Presentation and organization
 - 2.4 Usefulness
- 3. Is there a significant relationship between the level of validity and the level of acceptability of the supplemental e-book as an alternative delivery mode?

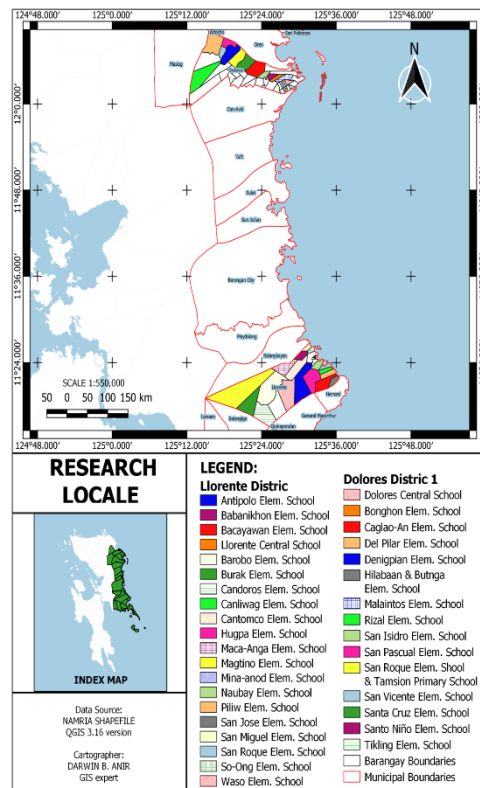
METHODS

Research Design

This study utilized the correlational, it is a correlation design because all information will be gathered about the relationship of the reading competencies, validity, and effectiveness of the supplemental e-book as an alternative delivery mode.

Locale of the Study

The study will be conducted in the Division of Eastern Samar which is composed of sixty school districts in the entire division. This study will use purposive sampling wherein the sample districts are identified for the research design of the study that is correlational design. For the convenience of the study, it chooses two school districts in the Eastern Samar Division, which are Dolores I and Llorente I district.



Respondents of the Study

This study will be composed of three groups of respondents. The first group of respondents will be randomly sampled grade 6 pupils using the Slovin Formula from the first school district in public elementary school, Eastern Samar Division, Eastern Samar, Philippines. The second group of respondents will be the four (4) expert- teachers' validators from each district in public elementary school, Eastern Samar Division. The third group of respondents will be another group of pupils from District B who evaluated the effectiveness of the activities in the work book using the pupil's evaluation checklist.

Table 1. *Distribution of Respondents*

School District	Number of Teachers per District	Number of Teachers Respondents	Number of Pupils per District	Number of Pupils Respondents	Total
District A	19	4	2580	346	350
District B	22	4	2040	334	338
Total	41	8	4620	680	688

Sampling Procedure

In determining the total sample population of the pupils, and expert teachers' respondents the study employs the purposive sampling technique. Purposive sampling is often far easier to implement in schools, such as the public elementary school in the Eastern Samar Division in the province of Eastern Samar. The researcher utilized two (2) out of sixty (60) school districts in the Eastern Samar Division to be randomly selected, and then the Slovin's Formula will be utilized to determine the number of pupils participants per school district. According to Nielson, (1992, cited by Dumas, Sorce, & Virzi, 1995), the acceptable number of expert evaluators for educational research is composed of at least three evaluators, and that the evaluator works independently. This study, utilized four for each school district as an expert-teacher evaluator.

The pupils and expert-teacher will be selected thru the random sampling fishbowl technique. Names of the respondents from each school selected will be listed and placed in a box and then the researcher will draw from each of the boxes the name of pupils per school district will be drawn. This process will be repeated until all respondents from every two districts will be selected. The procedure will be repeated until 346 first group of pupils, then 8 teacher-expert, and 334 third group of pupil participants from District II.

A total of 688 respondents will be selected, 346 from the first group, 8 of the teacher-expert, and 334 from the third group of pupil participants.

Research Instrument

Diagnostic test

The 30-item diagnostic test measured the least learned competencies of the Grade 6 pupils in reading. The test will be subjected to content and construct validity. The inter-item reliability will be found to be high based on the item analysis to be conducted.

Expert validator's instrument

The teacher-expert validator's instrument will be a standardized evaluation tool for the e-book adopted from the Department of Education.

Pupils' evaluation checklist

The pupil's evaluation checklist will be a researcher-made instrument subjected to content and construct validity. Likewise, the checklist will be subjected to a reliability test and obtained a Cronbach's alpha value of 0.87 suggesting that the items have relatively high internal consistency.

Data Collection Method

A permission letter, cover letter, and informed consent documents from the office of two school division superintendents in the province of Eastern Samar understudy will be secured to allow the researcher to administer the survey questionnaire and interview and to obtain some pertinent documents that helped corroborate the answers of the respondents.

Upon approval of the request, the researcher will distribute the questionnaire via google forms and teleconference interviews thru google meet flat form to the selected respondents. Retrieval will be done right after the questionnaires will be completed.

Analysis of Data

Data will be gathered through the use of the face validation tool as a guide in knowing the respondents' feedback regarding the supplemental e-book after exposure. The face validation tool will be then administered for the e-book's validity. After which, the answered questionnaires will be collected then tabulated, analyzed, and interpreted. The weighted mean will be solved then the grand mean will be used for the general interpretation of the responses. The pupil's score in the diagnostic test, level of validity, and level of acceptability was also tabulated for easy interpretation. Its mean and standard deviation will be computed.

Analyzing the data related to the development of e-book is done through experts' validation and trial phase. It will be done by calculating the score and interpreting the comments and suggestions given by the experts as the considerations of revisions. Inferential statistics will be used to correlate the level of reading competencies, level of validity, and the level of acceptability, Pearson r Coefficients Correlation will be used. To test, the null hypothesis of the study will be set at a 0.05 level of significance. The null hypothesis will be rejected when the observed significance level or p-value of the test will less than 0.05; otherwise, the null hypothesis will be accepted.

RESULTS AND DISCUSSION

Level of Validity of the Developed E-book

Table 1 presents the Cronbach's alpha value for each of the factors evaluated in terms of format, language, content, and evaluation. It can be seen that in all of the factors, only the format of the developed e-book obtained a high reliability ($\alpha = .703$) while all other factors have shown low reliability ($< .395$). It can be said, that based on the responses provided by the respondents, only format is evaluated to have high consistency. Hence, there is a need to revisit other aspects of the developed material in order to increase the reliability value.

Table 1. *Level of Validity of the Developed E-book based on Cronbach's alpha value*

Factors	Cronbach's Alpha ^a	Interpretation
Format	0.703	High
Language	0.395	Low
Content	0.068	Low
Evaluation	0.383	Low

Level of Acceptability the Developed e-book

The acceptability of the developed was evaluated based on Learning competencies, Appropriateness, Presentation and Organization, and Usefulness. As presented in table 2, two (2) of the four indicators are very highly evident, while the remaining two (2) are evident. Based on the agreement given by the respondents, indicators on appropriateness and presentation and organization are very highly evident. Meanwhile, indicators on learning competencies and usefulness are evident. The findings show that in terms of acceptability, respondents have an agreement that appropriateness and presentation of the e-book is very highly acceptable while its learning competencies and usefulness are to some extent acceptable. Over-all, presentation and organization obtained the highest mean rating indicating that this has the highest acceptability among the four factors. The level of acceptability is learning competencies, appropriateness, presentation and organization, and usefulness.

Table 2. *Level of Acceptability of the developed e-book.*

Indicators	Mean	Standard Deviation	Interpretation
LC1	4.0909	0.83121	Evident
LC2	3.4545	1.12815	Evident
LC3	3.2727	0.46710	Very Highly Evident
LC4	4.0909	0.53936	Evident
LC5	4.7273	0.46710	Very Highly Evident
LCAVE	3.9273	0.41253	Evident
A1	4.7273	0.46710	Very Highly Evident
A2	4.2727	0.78625	Very Highly Evident
A3	4.0909	0.53936	Evident
A4	3.9091	0.83121	Evident
A5	4.0000	0.63246	Very Highly Evident
AAVE	4.2000	0.32249	Very Highly Evident
P1	4.4545	0.52223	Very Highly Evident
P2	4.1818	0.75076	Evident
P3	4.2727	0.78625	
P4	4.1818	0.75076	Evident
P5	4.1818	0.75076	Evident
PAVE	4.2545	0.26968	Very Highly Evident
U1	3.9091	0.94388	Evident
U2	4.2727	0.46710	Very Highly Evident
U3	4.4545	0.82020	Very Highly Evident
U4	3.7273	0.64667	Evident
U5	4.4545	0.68755	Very Highly Evident
UAVE	4.1636	0.35573	Evident

The table shows the scale of evident; competencies and usefulness are evident while appropriateness and presentation are very highly evident and the presentation and organization are very highly evident with this the level of acceptability answered through the interpretation of data.

Relationship between Level of Validity and Level of Acceptability of Developed E-book

Table 3 reveals the results of the test of relationship between the level of validity and level of acceptability of a developed e-book. Summated mean scores of each of the factors were correlated in order to ascertain the degree and magnitude of association. However, by looking at the data, it is revealed that none among the variables has exhibited linear relationship. This mean that the level of acceptability of the developed e-book is not influenced by the level of validity.

Table 3. *Test of relationship between level of validity and level of acceptability of a developed e-book*

		Learning Competencies	Appropriateness	Presentation and Organization	Usefulness
Format	r	-0.465	-0.460	0.396	-0.318
	p value	0.149	0.155	0.228	0.341
Language	r	-0.351	0.216	0.088	-0.484
	p value	0.290	0.524	0.797	0.131
Content	r	0.014	0.130	0.508	0.420
	p value	0.968	0.704	0.111	0.199
Evaluation	r	-0.454	-0.341	-0.135	-0.042
	p value	0.161	0.304	0.692	0.902

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

CONCLUSION

1. Among the four features of the developed e-book, only format have shown acceptable level of reliability. Others have shown low reliability suggestive of the need to revisit other features of the material.
2. Learning competencies, appropriateness, presentation and organization, and usefulness are generally acceptable to the respondents. Meanwhile, presentation and organization of the material obtained the highest acceptability level.
3. The level of validity does not show linear relationship with the level of acceptability of the developed e-book.

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