

# How to Measure Exam Performance When Different Reading Modes are Employed?

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**Abstract:** *Though there are many available methods for analyzing the Exam performance of students the method on how to analyze when students utilize different modes for their learning purposes are unknown or often overlooked. This article describes the deficiencies and proposes a method to employ and understand the Exam performance differentiations with different reading modes, along with an attached usable questionnaire. Resulting in better understanding of Exam performance when different modes of reading are employed and extended generalizability of the concept geographically.*

**Keywords:** Exam performance, Reading, Different Modes of Reading, Performance, Factors of Exam Performance, Impact of Reading Modes, E-Book reading, E-Book efficiency, Printed book efficiency

## 1. Introduction

Though several studies in this research area are found most of them are limited in several contexts such as where most studies being constricted to very small focus groups hence lacking diversity (T. Frank, 2017).

There is high variability of preference prevalent among different student types including but not limited to high schools and universities on the selection of e-Books or Printed books as primary medium of study for text book purposes and research (Lam et al., 2009).

The usage of printed books is supported by several evidences such as higher retention rates (Flood, 2014), reduced need for repetitive reading to grasp the same level of contents (Garland & Noyes, 2004; Kraft, 2012; Staff, 2013), higher comprehension and understanding capabilities (Allcott, 2021; Baron, 2017) eventually leading to higher knowledge retention eventual academic performance. Preference is hampered with the increased eye strain factor caused by reading e-Books (Rosenfield, 2016).

This explains the different perception of prevailing among students of different types while the scientifically proven impact on their retention, time needed for studying, eye strain factors and comprehension and understanding levels are understood in greater extent. This will need a study and hence this paper develops the research instrument for the usage of future studies.

### Methods

The systematic review focused with support of several research articles freely available online essentially through Google Scholar was utilized for the purposes of analysis while the terms and keywords looked for was “e-Books”, “Printed books” with emphasis on factors “Comprehension and Understanding”, “Retention”, “Need for Repetition”, “Exam Performance”, “Preference” and “Eye strain” which are underlying factors identified (Lam et al., 2009).

The questionnaire was developed from the above literatures and questionnaire harvesting from different sources supporting the underlying Conceptual Framework variables as listed above and in order to ensure all Research Objectives are satisfied. Questionnaire is made available in the Appendix section of this article with appropriate sources of adopted, adapted and developed questions.

## 2. Discussion & Findings of Methodology on Instrument Development

### Development of Learner’s Profile

The above Learner’s Age variable can be assessed using an age group such as 20-25, 26-30 and so on rather than directly asking for age as such method in questionnaires is employed in (*The Questionnaire Your Age*, n.d.), and also age group with gender can be observed at (alexclow, 2012) and (jaybullimore98, 2015) and (Aminatta21, 04:25:17 UTC). The analytics of other research questionnaires and data analysis shows learners and non-learners section with age (years) and gender, while the standard deviation and average was being measured (D. Frank et al., 2018), which shows the importance of this variable.

### Development of Student Type

Student Type variable can be assessed for the grouping of this study between High school students and University undergraduates while such student type can be observed at (*The Questionnaire Your Age*, n.d.), which has student types and working at being a school type too. This includes aspects of Faculty Age and Student Age being determinants of Student Type while similar analysis of study could be seen at (Beebe et al., 2014) and similar student survey questions (“Top 16 Student Survey Questions to Enhance Your Student Feedback,” 2018).

a) The research students have profound impact on the e-Book and printed book usage (Gilbert & Fister, 2015) and this shows the relationship with many variables where the research level and interest in referencing and also the year of study in the university have shown an impact and hence the questions were adapted based on

this with appropriate changes to wordings considering the university year naming in Sri Lanka as the original questionnaire where Freshman, Sophomore year, Junior, Senior years are naming of USA which is not practiced in Sri Lanka (Head, 2017).

- b) Student Type could include part time and full time student which ensures the applicability to this construct and is adopted directly from (Ahmed, 2018).
- c) Exam performance based on exam scores are assessed to understand the relationship between factors which might affect the study variables and is one feature of the Student Type and is adapted with scale from (Pilcher et al., 2017) which ensures the understanding and it is difficult to get a numerical value due to several tests and student might be unwilling and hence utilized a Interval Scale to mark on to understand the basic level of the student.

### Development of Eye strain

Eye strain something which occurs when using digital devices which is associated with the widely known computer vision syndrome which refers to the ocular symptoms occurring from usage of digital devices (*Digital Eye Strain*, n.d.). Several questionnaires are developed in this regard which can be adopted are Hayes questionnaire, Visual fatigue scale, computer vision symptom scale and computer vision syndrome questionnaire which includes a separate contact lens wearer version (*Digital Eye Strain*, n.d.). There are similar questionnaires developed for video display terminal operators as well who are staff members and their health impact is assessed through this (Rajabi-Vardanjani et al., 2014). The most common symptoms reported are dry eyes, eye strain, irritated or burning eyes, tired eyes, headache, sensitivity to bright lights, eye discomfort, blurred vision when viewing a computer screen and also when looking at long distances including difficulty or slowness in refocusing eyes from one distance to another (Sheppard & Wolffsohn, 2018). There are further reliability and validity tested questionnaires which uses a scale of impact based on frequency followed by intensity (Seguí et al., 2015a). Such studies using such pre validated questionnaires resulted in positive results among study groups representing the impact from computer screen usage (Ahuja et al., n.d.).

Based on the questionnaires analyzed for adoption purposes as available under **Error! Reference source not found.** of this research for the Eye strain construct, the following could be summarized

- a) (Shin & Han, 2012) Visual Fatigue Scale questionnaire has a relatively general approach instead of focusing on the Eye strain perspective as expected from this construct and therefore is not selected.
- b) (Bess & Hornsby, 2014) Children Version of Visual Fatigue Scale questionnaire also takes a similar approach as above questionnaire where its more general than being focused on eye strain perspective and is a children version of the same, and therefore the study population of this research are teens and young adults and isn't children and therefore this questionnaire was not selected.
- c) (Rosenfield et al., 2015, p. 4) Hayes Questionnaire did study some parts of eye strain and even though

considers the computer screen viewing factors but the entire questionnaire was not purely focused on eye strain and instead covers headache and other factors and at the same time the computer screen is only mentioned in one question of the entire questionnaire and therefore might not be suitable for analysis of an eye strain construct.

- d) (Seguí et al., 2015b) Computer Vision Syndrome focuses on visual fatigue and similar aspects which are related to the construct eye strain but still it uses a numbering and calculation based approach resulting in a score therefore the participants are stripped of the ability of selecting answers which are present on a usual questionnaire and limits the subjective judgement taking from the participant and might inhibit the questionnaire collection process and could also cause issues at analysis stage, and therefore it was not selected either.
- e) (González-Pérez et al., 2014) which studies the Computer Vision Syndrome scale which satisfies the requirements for eye strain construct data collection and at the same time its emphasis on the screen and computer screen aspects in most of the questions and highly linked with eye strain data collection and therefore this questionnaire was selected and adapted for the eye strain construct where the name computer is changed with e-Books.

### Development of Preference to e-Books

Questionnaires inquiring regarding the preference of the print books or e-Books from the users uses the five point scale which includes Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree (Enis, 2018)

The questionnaire from ("Printed Books vs. E-Books - Survey Report," 2015) do include the impact of cost elements with regards to the preference to e-Books.

Another Questionnaire which is related introduces how often (frequency) use of e-Books and purpose of eBook usage, types of books ("A Survey of EBook Usage and Perceptions at the University of Liverpool," 2010) are some additional questions which could be included in the questionnaire based on the derivation.

- a) (Kozłowski, 2012) Preference to eBooks questionnaire considers the important aspects of the construct whereas the importance to study the preference as well as the understanding on comparative basis among the student whether the textbooks in printed form will be purchased on the first instance by the student will be assessed through it, therefore this questionnaire section is adopted.
- b) (Korwitts, 2015) studies the social aspects and understand the participant whether they have read books and are actually interested in book reading and then analyses the purchase patterns and preference and reason the ownership of e-Reader if owned therefore has a more in-depth data collection about the participant and therefore this questionnaire will also be adopted and overlapping questions will be removed.
- c) ("Printed Books vs. E-Books - Survey Report," 2015) studies the cost element involved with regard to

preference and therefore this section will be adopted in the questionnaire for this construct.

- d) ("A Survey of EBook Usage and Perceptions at the University of Liverpool," 2010) discussed on the perception and usage pattern of e-Books which is not directly linked towards analysing the preference and therefore was not included in the adoption of questions for this construct.

#### Development of Comprehension and Understanding

Technology and its features and other similar comprehension features are assessed through different questionnaires including of (Palilonis & Butler, 2015).

The following questionnaire is related to the relevant study of reading comprehension among students of Grade 9, but due to the lower grade and questionnaire elements being not directly related this is left out.

The nature of the literature derived questionnaires seems to be not linked with the aim of this research and therefore first questionnaire will be used as it also has more optimal number of questions in the questionnaires.

Active Reading questionnaire analyses the reading under three main categories namely technology, purpose and physical strategies (Palilonis & Butler, 2015) while the most important questions for extraction for the researcher's research will be from the purpose section where the comprehension and understanding parts are discussed and such sections regarding the understanding scope will be extracted for use and adaption with e-Books and printed books comparative terms in the questionnaire.

- a) The questionnaires selected do have a selective mode for reading, but lacks to identify the aspect between e-Books and printed books which is the objective of the researcher's research and therefore such addition to each question is performed through adaption.
- b) (Ezudein, 2017) Comprehension of Reading questionnaire is adapted with the changes to questions in order to include the comparison aspect among e-Books and printed books is performed and as displayed in the above sample and this questionnaire.
- c) (*Questionnaire English Reading Comprehension / English Language / Word*, n.d.) English Comprehension Questionnaire is more emphasized on the English language and reading on a specific language, but the study population might be reading e-Books and printed books in another language as well as a subject other than English language and therefore this questionnaire was not selected.
- d) (*The Effect of Differentiated Instruction Strategy on Developing Ninth Graders' English Reading Comprehension Skills at Gaza UNRWA Schools / Semantic Scholar*, n.d.) Reading Comprehension questionnaire is purely focussed on Grade 9 and also targets mostly based on the skills of comprehension rather than understanding the differing modes of reading and subjective estimation of the participant is not available and the study population is not Grade 9 or nearing grades and therefore this questionnaire was not selected.

- e) (Palilonis & Butler, 2015) Active Reading questionnaire do contain questions regarding comprehension as well as understanding aspects which is important to analyse and collect data for the construct comprehension and understanding and therefore this questionnaire questions which are of understanding part were selected for adaption and necessary wording changes to compare between e-Books and printed books were performed.

#### Development of Retention

Evaluation of knowledge retention and student learning activity success rate in universities can be accessed through questionnaires (*Read "Evaluating and Improving Undergraduate Teaching in Science, Technology, Engineering, and Mathematics" at NAP.Edu*, n.d.).

Memory Functioning Questionnaire (MFQ) is one of the questionnaires regarding the memory and retention test but the attached questionnaire is more likely a questionnaire which aims to understand the memory related illnesses and not for normal people and students (Gilewski & Zelinski, 1988).

- a) (Gilewski & Zelinski, 1988) Memory Functioning Questionnaire was mostly targeting on the retention aspects of the person but is not directly linked towards the reading retention aspect whereas it is more oriented towards the medical memory functioning but still this questionnaire includes a forgetting or memory retention aspect of the reading part as a part of the questionnaire and therefore it could be adapted by implementing the e-Books vs printed books aspect in such questions, therefore this questionnaire section is selected and adapted with necessary wording modification regards to inclusion of e-Books and printed books were performed.
- b) (Troyer & Rich, 2017) Multifactorial Memory Questionnaire questions are more general regards to the retention and memory capacity of the participants which is relatively medical oriented but still is more of a general capability on the retention rather than focusing on the reading retention aspects and lacks such reading retention section as well and therefore this questionnaire was selected with only appropriate questions which match this study and adapted with wording modification regards to inclusion of e-Books and printed books terminology.
- c) Two questions were developed for the purposes for the retention construct which assess the e-Book vs printed book retention superiority and the percentage and scale of such superiority of one over the other where the questionnaire would contain such questions to assess the retention construct which was developed from the ideas sought from Novel vs. DVD reading retention concept by (Bartleby, 2021).

#### Development of Repetition

The use of repeated reading will assist in improved retention and pronunciation were visible during post-test results than the pre-test results (Riquelme Gil, 2017) and therefore better grasping of the new content was evident.

- a) The amount of content understanding from a medium of knowledge gaining (i.e. listening in this case) was assessed based on the content understood with listening and was assessed from the amount of content understood whereas the same questionnaire has weekly listening

sessions based analysis and questions which insists on the repetitive factor (Goh, 2010) which helped as foundation for the questions on reading retention and repetition, number of repetitions required to achieve same grasping level, comprehend capacity for each medium and confidence on both medium of reading.

- b) The usage of the subjective questions such as how good reader are you are performed in addition to the fact of comparison between two medium of knowledge gaining through questions where it was analyzed among listening vs reading (Mehigan, 2020). This lead to the support of the development of subjective questions development on the reader's perspective such as different modes of reading and the confidence levels extracted through questions from the respondent itself and this also lead to the development of questions which analyzes two different modes of reading which is e-Books and printed books just like how listening and reading was used as questions by (Mehigan, 2020).
- c) The design and development of research survey questions and probe methods such as comprehension/ interpretation paraphrasing and recall probe can be classified and even survey questions might looks simple much consideration are to be given on understanding of the participants cognitive, psychological and communication principles (Bautista, 2020). This literature supported with the design and development of the questions for the repetition construct and in the way the questions were asked from the participants.

#### Development of Exam Performance

Measurement and sampling are important aspects before data collection and emphasis on development, adoption or adaption of the measurement is required (*Develop the Instrument*, n.d.).

The usage of effective questions are important as it would create bias and tendency for the participant to mark the same response for each statement if questions are similar and therefore changing the response option wordings and also changing the questions in positive, negative types will help overcome this situation (Barnum, 2011).

The approach taken was to study the perspective of usage of class end quizzes which were studied whether to improve the exam performance of the students or not and such was assessed by the above-described block experiment with questionnaires issued with regard to them. This extracts the exam performance link with quizzes and also repetition through quizzes perspective but the questionnaire is of no direct relevance to the objectives of the researcher's research even the concept matches.

The questionnaire which predicts the exam performance of the student studies it through questions including overall GPA and score achieved in the course in percentage and number formats (Helzer & Dunning, 2012). This questionnaire matches the objective of the researcher's research which intends to study the exam performance achievements among two types of book readers, namely e-Books and printed books and therefore is selected for adaption with necessary wording changes to match this

research and also include the fact of comparative wordings among e-Books and printed books separately.

The above questionnaire considers different aspects of the college student performance and is therefore linked to the researcher's research in specific parts of that questionnaire whereas it discusses the class activity of the student which is on day to day basis which is not related to the objectives of this research but the education level which is also considerably the student type construct is emphasized and the quality of textbooks and exams, assignments and also the course outcomes such as increased outcomes and similar are also assessed in this questionnaire which supports the adaption of questions for this construct.

- a) (Barnum, 2011) Task Performance and Usability questionnaire discusses on the approach taken for questionnaire development such as positive negative question changing and answer value changing to reduce bias and tendency to mark the same answer, and at the same time this questionnaire evaluates the easiness of the program and satisfaction-oriented questions which are not directly related to exam performance, and was adapted for exam performance-oriented questions with appropriate wording modifications with e-Books and printed books.
- b) (Vinall & Kreys, 2020) Class End Quiz and Questionnaire to assess its effectiveness, which is one of the conceptually agreeing questionnaire whereas the objective is to study the exam performance and the relevance still the experiment nature and other aspects of the questionnaire do not fulfill the research objectives of the researcher's research and therefore not selected.
- c) (Helzer & Dunning, 2012) Prediction of Exam Performance of Students questionnaire matches the researcher's research intention to study the exam performance of students among different modes of reading and such changes will be included in the questionnaire and will be adapted for this research exam performance construct.
- d) (National Research Council, 2003) College Student Report Questionnaire will study the course outcomes such as increased outcome and at the same time study the student type in addition to it which are the related aspects out of this entire questionnaire and such are selected and adapted with modified wordings as e-Books and printed books.

#### Development of Effective Mode of Reading

An effective mode of reading can be implementing using the SQ3R methodology where the methodology suggests Survey, Question, Read, Recite and Review as the five step techniques of effective reading (Kasmawati & Sakkir, 2020), and therefore it is to be tested based on these five factors whether this is supported by the suggested modes of reading namely the e-Books and printed books and how accommodative are they in achieving these.

Survey is where before reading establishing the purpose which could also be known as the scanning and the question is turning the headings into direct questions and check and read the most interested material and how such can help you with the information required for gathering while the Read is

the understanding capability with reading which will make sure of finding of answers to the knowledge hunger and recite will be able to use own words and paraphrase the text finally ends up with review which is re-reading of the text for clarification purposes.

The usage of SQ3R will help improve the reading comprehension (Alicia, 2017; Syahfutra, 2017) and therefore this shows the connection between the model as well as the comprehension and understanding and in addition to that it was also seen to have students achievement and therefore links with the exam performance and also as factors of effective mode of reading (Bakhtiar, 2019).

Based on the links developed and discussed the following questions were developed for the effective mode of reading construct from the foundation of the five factors explained under SQ3R methodology on effective mode of reading (Kasmawati & Sakkir, 2020) where the five factors were directly changed into questions with e-Books and printed books wordings and hence almost near adaption but as this is taken from a theoretical methodology where existing questionnaire is not directly available hence considered as developed questions.

### 3. Conclusion

This article concludes with the developed research instrument which is developed by adhering to the concepts developed on this research area which are supported by existing literature whereas each question added is made available of the methodology of selection and literature support; hence this research instrument questionnaire is instantly usable for further studies in this research area expanding demographically and geographically and also this can be further adopted, adapted or even developed differently for the usage of future researchers.

The developed instrument will help researchers understand the student's academic performance in different lens, where the impact of the different reading mode selection is understood. Eventually researchers can work in future filling the knowledge gap present in this research area and contributing to the world of science.

### 4. Recommendation

The application of the questionnaire presented in this article for future studies will help generalize the study findings globally through expansion into different geographic areas covering diversity of culture and demographics.

Usage of e-Books are better limited or prevented in use as a textbook alternative and awareness of restricting student's textbook reading from digital screens in academic settings will yield greater academic performance and results.

Supporting such preventive activity by offering printed text books instead of e-Books for students at universities and copies of major textbooks made available at such University Libraries.

Performing the study within the university or specific Faculty with the attached Research Instrument and evaluating results which will enhance generalizability but also provide guidance on best course of action within the university and its library.

### 5. Further Study Scope

Customizability of e-Books have profound positive impact on certain groups of students presented with disability (Thomson et al., 2013), even though results being limited to a fraction, further study in disable students' academic improvement through use of e-Books would be of greater benefit.

Generalizing this study further among different geographic extents through replicating and conducting this research, even within universities and other academic setting will lead to better knowledge gap filling and eventually lead to new improvements in this research area.

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#### Appendix – Questionnaire with Justification

Answer this questionnaire with the perspective of e-Books or Printed book usage and experience, and your personal judgement (what you think about it) when reading from such modes.

#### Monetary Reward

The phone number is not saved except for immediate processing of the reload on voluntary completion of the entire questionnaire.

Mobile No –

Mobile Type – Post-paid/Pre-paid

#### Construct – Learner's Profile

- 1) Your Age – 18 – 30 (Numerical Scale | Adopted | (Frank et al., 2018))
- 2) Gender – Male/Female (Nominal Scale | Adopted | (Yahya et al., 2012))
- 3) District – (Nominal Scale | Adopted | (Sukati, 2018))
  - a) Colombo
  - b) Gampaha
  - c) Kalutara
  - d) Kandy
  - e) Matale
  - f) Nuwara Eliya
  - g) Galle
  - h) Matara
  - i) Hambantota

- j) Jaffna  
k) Kilinochchi  
l) Mannar  
m) Vavuniya  
n) Mullaitivu  
o) Batticaloa  
p) Ampara  
q) Trincomalee  
r) Kurunegala  
s) Puttalam  
t) Anuradhapura  
u) Polonnaruwa  
v) Badulla  
w) Moneragala  
x) Ratnapura  
y) Kegalle
- 4) Province – (Nominal Scale | Adopted | (Sukati, 2018))  
a) Western Province  
b) Central Province  
c) Southern Province  
d) Uva Province  
e) Sabaragamuwa Province  
f) North Western Province  
g) North Central Province  
h) Northern Province  
i) Eastern Province
- 5) University of Studies – (Nominal Scale | Adapted | (Sukati, 2018))  
a) University of Colombo  
b) University of Peradeniya  
c) University of Sri Jayewardenepura  
d) University of Kelaniya  
e) University of Moratuwa  
f) University of Jaffna  
g) University of Ruhuna  
h) The Open University of Sri Lanka  
i) Eastern University, Sri Lanka  
j) South Eastern University of Sri Lanka  
k) Rajarata University of Sri Lanka  
l) Sabaragamuwa University of Sri Lanka  
m) Wayamba University of Sri Lanka  
n) Uva Wellassa University of Sri Lanka  
o) University of the Visual & Performing Arts  
p) Gampaha Wickramarachchi University of Indigenous Medicine  
q) University of Vavuniya
- 6) Earlier used e-Books (Ordinal Scale | Adopted | (Shelburne, 2009))  
1) Very much  
2) Some much  
3) Somewhat  
4) Not much  
5) Not at all
- 9) Research Level at your current level of Study (Ordinal Scale | Adapted | (Gilbert & Fister, 2015))  
a) Very High  
b) High  
c) Moderate  
d) Low  
e) Very Low
- 10) Academic Level (Interval Scale | Adapted | (Pilcher et al., 2017))  
a) I get 70%+ in most exams  
b) I get 60%+ in most exams  
c) I get 50%+ in most exams  
d) I get 40%+ in most exams  
e) I struggle in most exams
- 11) Are you interested in reading research papers and referencing? (Interval Scale – Likert Scale | Adapted | (Gilbert & Fister, 2015))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 12) Do you refer to academically related content very much? (Interval Scale – Likert Scale | Adapted | (Gilbert & Fister, 2015))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree

**Construct – Eye Strain**

- 13) Do the letters on the screen become blurred when reading e-Books? (Ordinal Scale – Likert Scale | Adapted | (González-Pérez et al., 2014))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 14) Do your eyes feel tired during or after reading e-Books? (Ordinal Scale – Likert Scale | Adapted | (González-Pérez et al., 2014))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 15) Do your eyes hurt when reading e-Books? (Ordinal Scale – Likert Scale | Adapted | (González-Pérez et al., 2014))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 16) Do you need to blink a lot while reading e-Books? (Ordinal Scale – Likert Scale | Adapted | (González-Pérez et al., 2014))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- Construct – Student Type**
- 7) What year do you currently study? (Interval Scale | Adopted | (Gilbert & Fister, 2015)) (1<sup>st</sup> Year Undergraduate/ 2<sup>nd</sup> Year Undergraduate/ 3<sup>rd</sup> Year Undergraduate/ 4<sup>th</sup> Year Undergraduate / 5<sup>th</sup> Year Undergraduate)
- 8) Study Type – Full-Time/Part-Time (Nominal Scale | Adopted | (Ahmed, 2018))



- 17) Do you need to strain your eyes to see well after spending time reading e-Books? (Ordinal Scale – Likert Scale | Adapted | (González-Pérez et al., 2014))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 18) Do you feel your eyes cross when reading from e-Books? (Ordinal Scale – Likert Scale | Adapted | (González-Pérez et al., 2014))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 19) When I'm reading e-Books, I have to blink because my eyes are dry (Ordinal Scale – Likert Scale | Adapted | (González-Pérez et al., 2014))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- Construct – Preference to e-Books**
- 20) Do you always buy the printed text books? (Nominal Scale | Adopted | (Kozłowski, 2012))
- Yes
  - No
- 21) What do you prefer? (Nominal Scale | Adopted | (Kozłowski, 2012))
- Paper
  - Digital
- 22) I prefer paper more than digital? (Ordinal Scale – Likert Scale | Adapted | (Kozłowski, 2012))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 23) How many books have you read in the last year? (Ratio Scale | Adopted | (Korwitts, 2015))
- 1 book
  - 2-3 books
  - 4-5 books
  - 6-10 books
  - 11 or more books
- 24) I purchased e-Books more than print books in the last 12 months? (Ordinal Scale – Likert Scale | Adopted | (Korwitts, 2015))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 25) Do you prefer to read e-Books more than print books? (Ordinal Scale – Likert Scale | Adopted | (Korwitts, 2015))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 26) Do you prefer using an e-Reader? (Ordinal Scale – Likert Scale | Adopted | (Korwitts, 2015))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 27) What e-Reader do you own? (Nominal Scale | Adopted | (Korwitts, 2015))
- Amazon Kindle
  - Barnes and Noble Nook
  - Kobo
  - Sony Reader
  - iPad
  - Other
- 28) Do you agree with the following statement: “E-Books will eventually become the most popular form of book in publishing”? (Ordinal Scale – Likert Scale | Adopted | (Korwitts, 2015))
- Strongly Agree
  - Agree
  - Neither Agree or Disagree
  - Disagree
  - Strongly Disagree
- 29) If e-Books and printed books cost the same, People would buy print books? (Ordinal Scale – Likert Scale | Adopted | (“Printed Books vs. E-Books - Survey Report,” 2015))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- Construct – Comprehension and Understanding**
- 30) When I read a story or other information, I understand better when reading from printed books? (Ordinal Scale – Likert Scale | Adapted | (Ezudein, 2017))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 31) I use illustrations or titles to help me figure out what a story is about, this is more true when reading from a printed book? (Ordinal Scale – Likert Scale | Adapted | (Ezudein, 2017))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 32) I comprehend easily what I read when reading from a printed book? (Ordinal Scale – Likert Scale | Adapted | (Palilonis & Butler, 2015))
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 33) I am able synthesize what I read easily when I read from a printed book?(Ordinal Scale – Likert Scale | Adapted | (Palilonis & Butler, 2015))
- Strongly Agree

- b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 34) I am able to understand the author's purpose more clearly when I read from a printed book?(Ordinal Scale – Likert Scale | Adapted | (Palilonis & Butler, 2015))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 35) I am able to understand the structure of the educational material more clearly when I read from a printed book?(Ordinal Scale – Likert Scale | Adapted | (Palilonis & Butler, 2015))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 36) I am able to understand the author's stance more clearly when I read from a printed book?(Ordinal Scale – Likert Scale | Adapted | (Palilonis & Butler, 2015))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree

**Construct – Retention**

- 37) I retain content better when reading a printed book than e-Books? (Ordinal Scale – Likert Scale | Adapted | (Gilewski & Zelinski, 1988))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 38) How much of the content can you retain in single read when using printed books? (Interval Scale | Developed | (Bartleby, 2021))  
a) 80% - 100%  
b) 60% - 80%  
c) 40% - 60%  
d) 20% - 40%  
e) Less than 20%
- 39) How much of the content can you retain in single read when using e-Books?(Interval Scale | Developed | (Bartleby, 2021))  
a) 80% - 100%  
b) 60% - 80%  
c) 40% - 60%  
d) 20% - 40%  
e) Less than 20%
- 40) Do you have any problems when remembering words or content read from e-Books than reading from printed books? (Ordinal Scale – Likert Scale | Adapted | (Troyer & Rich, 2017))  
a) Very Much  
b) Somewhat Very Much  
c) Nor Much nor none  
d) Somewhat None  
e) None

When reading a novel or textbook, how often do you have trouble remembering what you have read from e-Books compared to printed books?

- 41) In the opening chapters, once you have finished the book. (Ordinal Scale – Likert Scale | Adopted | (Gilewski & Zelinski, 1988))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 42) Three or four chapters before the one you are currently reading. (Ordinal Scale – Likert Scale | Adopted | (Gilewski & Zelinski, 1988))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 43) The chapter before the one you are currently reading. (Ordinal Scale – Likert Scale | Adopted | (Gilewski & Zelinski, 1988))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 44) The paragraph just before the one you are currently reading. (Ordinal Scale – Likert Scale | Adopted | (Gilewski & Zelinski, 1988))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 45) The sentence before the one you are currently reading. (Ordinal Scale – Likert Scale | Adopted | (Gilewski & Zelinski, 1988))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree

**Construct – Repetition**

- 46) Do you feel the need to repeat the content again and again in order to retain them, when reading through e-Books than Printed Books? (Ordinal Scale – Likert Scale | Developed | (Bautista, 2020; Goh, 2010; Mehigan, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 47) Have you repeated the same text again due to unable to comprehend or retain in the first reading, when reading through e-Books than Printed Books? (Ordinal Scale – Likert Scale | Developed | (Bautista, 2020; Goh, 2010; Mehigan, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral

- d) Disagree  
e) Strongly Disagree
- 48) How confident are you on the ability to retain and absorb the content in one shot (one reading, without repetition), when reading through e-Books than Printed Books? (Ordinal Scale – Likert Scale | Developed | (Bautista, 2020; Goh, 2010; Mehigan, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 49) Do you feel printed books need a smaller number of repetitions (or none at all) when reading compared with e-Books? (Ordinal Scale – Likert Scale | Developed | (Bautista, 2020; Goh, 2010; Mehigan, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 50) How significant is the above need for repetitions when reading through e-Books? (Ordinal Scale – Likert Scale | Developed | (Bautista, 2020; Goh, 2010; Mehigan, 2020))  
a) Very Significant  
b) Somewhat Significant  
c) Not Significant neither Insignificant  
d) Somewhat Insignificant  
e) Insignificant
- How many times do you need to read the same text to achieve full grasp of the material?
- 51) When reading through e-Books: (Ordinal Scale – Likert Scale | Developed | (Bautista, 2020; Goh, 2010; Mehigan, 2020))  
a) 5 times or more  
b) 4 times  
c) 3 times  
d) 2 times  
e) 1 time / Single read
- 52) When reading through Printed Books: (Ordinal Scale – Likert Scale | Developed | (Bautista, 2020; Goh, 2010; Mehigan, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- Construct – Exam Performance**
- 53) How difficult were you for to achieve the expected results when using e-books compared to printed books? (Ordinal Scale – Likert Scale | Adapted | (Barnum, 2011))  
a) Very Difficult  
b) Difficult  
c) Neither Difficult nor Easy  
d) Easy  
e) Very Easy
- 54) How easy were you able to prepare and perform in your examinations when studied using e-Books instead of printed books? (Ordinal Scale – Likert Scale | Adapted | (Barnum, 2011))  
a) Very Difficult  
b) Difficult  
c) Neither Difficult nor Easy  
d) Easy  
e) Very Easy
- 55) How satisfied are you with achieving expected exam achievements when using e-books instead of printed books? (Ordinal Scale – Likert Scale | Adapted | (Barnum, 2011))  
a) Very Satisfied  
b) Somewhat Satisfied  
c) Not Satisfied neither Not Satisfied  
d) Somewhat Not Satisfied  
e) Not Satisfied
- 56) How much marks will you obtain per module if you read only e-Books for the entire semester out of 100? (Ordinal Scale – Likert Scale | Adopted | (Helzer & Dunning, 2012))
- 57) How much marks will you obtain per module if you read only Printed books for the entire semester out of 100?(Ordinal Scale – Likert Scale | Adopted | (Helzer & Dunning, 2012))
- 58) Best performance was given when using printed books instead of e-Books at examination? (Ordinal Scale – Likert Scale | Adapted | (National Research Council, 2003))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 59) Printed books help more with memorizing than e-Books?(Ordinal Scale – Likert Scale | Adapted | (National Research Council, 2003))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 60) Printed books help more with analysing than e-Books?(Ordinal Scale – Likert Scale | Adapted | (National Research Council, 2003))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 61) Printed books help more with synthesizing than e-Books?(Ordinal Scale – Likert Scale | Adapted | (National Research Council, 2003))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 62) My learning and performance increased when using printed books than e-Books? (Ordinal Scale – Likert Scale | Adapted | (National Research Council, 2003))

- a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 63) My interest in the subject increased when using printed books than e-Books?(Ordinal Scale – Likert Scale | Adapted | (National Research Council, 2003)  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 64) Printed books are a better instruction medium than e-Books?(Ordinal Scale – Likert Scale | Adapted | (National Research Council, 2003)  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree

e) Strongly Disagree

**Thank you for your participation & time.**

**Construct – Effective Mode of Reading**

- 65) Whether e-Books are easier than printed books for your survey and scanning needs of book reading?(Ordinal Scale – Likert Scale | Developed | (Kasmawati & Sakkir, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 66) Whether e-Books are easier than printed books for your questioning skills when reading a book?(Ordinal Scale – Likert Scale | Developed | (Kasmawati & Sakkir, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 67) Whether e-Books are easier than printed books for your reading needs of book reading?(Ordinal Scale – Likert Scale | Developed | (Kasmawati & Sakkir, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 68) Whether e-Books are easier than printed books for your recitation needs of book reading?(Ordinal Scale – Likert Scale | Developed | (Kasmawati & Sakkir, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree  
e) Strongly Disagree
- 69) Whether e-Books are easier than printed books for your reviewal skills of book reading?(Ordinal Scale – Likert Scale | Developed | (Kasmawati & Sakkir, 2020))  
a) Strongly Agree  
b) Agree  
c) Neutral  
d) Disagree