



## Development and Evaluation of Task-Based Material in Business Mathematics for Senior High School

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### Abstract

Instructional material development is vital in filling the gap in the learning needs of students. Many research found that using varied instructional materials contributes to better student achievements. This study focused on developing and evaluating a task-based material to be used by Grade 11 students in the Accountancy Business and Management strand. This research analyzed the validity and readability of the developed task-based material in Business Mathematics employing the descriptive-development method. The task-based material was evaluated along content, face, presentation and organization, and accuracy and up-to-dateness of data. The developed task-based material has high validity index in terms of content, face, presentation and organization, and accuracy and up-to-dateness of data. In terms of the readability test, the material is fairly easy to read and comprehensible to at least Grade 5 students. It is recommended that the material be subjected to pilot testing, vetting, approval, and intellectual property right application.

### Introduction

The Philippines implemented the K to 12 curricula in June 2011. The K to 12 curriculum covers kindergarten up to Grade 12 as basic education. Mandatory schooling starts from kindergarten, Grades 1 to 6 (elementary level), Grades 7 to 10 (junior high school level), and Grades 11 and 12 (senior high school level). This government action aims to ensure that all students will be equipped with enhanced basic life skills for lifelong learning and employment, local and abroad (Philippine Government, 2013). This change in the basic education program curriculum brought changes in the teaching-learning process. Curriculum and instruction are the meat of the educational process. Real

change in education comes with changes in the content teachers teach and students learn and the instructional methods teachers use. Both curriculum and instruction, in turn, are shaped by expectations about the kinds of educational outcomes that students should manifest by the time they graduate from high school (National Academic Press, 1997). In the Grade 11 Accountancy, Business, and Management (ABM) strand, Business Mathematics is a prerequisite subject for Business Ethics and Social Responsibility in Grade 12. Hence, Grade 11 learners must fully understand the important concepts in Business Mathematics. Business Mathematics in Grade 11 aims to provide an understanding of the basic concepts of mathematics as applied in business. It includes a review of fundamental mathematics

operations using decimals, fractions, percent, ratio, and proportion; mathematic concepts and skills in buying and selling, computing gross and net earnings, overtime and business data presentation, analysis, and interpretation.

Since Business Mathematics is one of the specialized subjects in the ABM strand and is of varied conceptual, knowledge, and theoretical applications, it is best taught through the augmentation of instructional materials. Instructional materials are deemed important to improve students learning. According to Chingos and Whitehurst (2012), students learn best when teaching is accompanied by varied instructional materials. Furthermore, Marbas (2017) emphasized that instructional media are vital in the teaching-learning process, enhancing the ability to read and write correctly, influencing pupils to participate actively in learning, and leading pupils to remember vocabularies.

Andaya (2014) added that the instructional factor is the number one predictor of achievement in contemporary math. Thus, having varied instructional materials would redound to better achievement among students. Teachers then may engage in developing materials that suit the students' grades as there is a significant relationship between the teachers' use of the different instructional strategies and their students' performance in Mathematics (McKenna & Dougherty-Stahl, 2015).

On the other hand, instructional materials should be contextualized and localized. In addition, Mouraz and Leite (2013) noted that contextualization is a prerequisite in addressing the content and organization of activities to be undertaken in the classroom. Students' engagement in their schoolwork significantly increases when they are taught why they are learning the concepts and how those concepts can be used in real-world contexts (Center for Occupational Research and Development, 2012). Suan (2014) suggested that students' attitudes and interests towards mathematics can be revolutionized by integrating the importance of mathematics in everyday life activities. Teachers are encouraged to find ways to motivate the students to learn mathematics despite difficulties.

If the main goal of the 21<sup>st</sup> century education is to build the learning capacity of individuals and

support their development into lifelong, active, independent learners, then teachers need to become 'learning coaches' – a role very different from that of a traditional classroom teacher. Learning coaches may guide to help students develop skills, but their main role is to offer the kinds of support that will help learners attain their learning goals. Teachers as learning facilitators will encourage learners to interact with knowledge – to understand, critique, manipulate, design, create, and transform it. Teachers will need to reinforce learners' intellectual curiosity, problem identification, problem-solving skills, and their capacity to construct new knowledge with others (Bolstad & Gilbert, 2012). Thus, creating challenging materials such as task-based materials are needed.

This study developed a task-based material in Business Mathematics for Grade 11 students in the Accountancy, Business, and Management (ABM) strand with the following objectives: determine the level of validity of the task-based material in Business Mathematics along with content, face, presentation, and organization, and accuracy and up-to-datedness of data and determine the readability index of the task-based material in Business Mathematics.

### **Conceptual Framework**

Task-Based Learning (TBL) is anchored on the following principles and characteristics: it is based on the use of tasks; students learn by interacting; its focus is on the use of authentic language; errors are part of natural learning; and the focus is on process rather than the product (Education Technology, 2014).

It also provides a planned and systematic training process, uses a multidisciplinary approach, introduces program goals and objectives clearly in advance, allows students to "learn while doing", develops teamwork skills, students are regularly monitored and supported while they are doing their tasks and motivates learning (Pamukkale University, 2017).

The Task-Based Material in Business Mathematics has big task, chapter goals, chapter overview, mathematics expectations, small tasks to be completed, timelines, and submission of small tasks, major curricular competencies, assessment, cross-curricular links, general format, differentiation,



lessons, chapter summary, and chapter exercises (refer to Annex A). In addition, teaching efficiency is improved in a TBL classroom because learners and their learning are the focus of attention instead of the teacher. Likewise, Albino (2017) asked about the opinions of his students when they were taught using the TBL. Findings show that learners felt encouraged to speak, believed in their potentials, expanded their vocabulary, and recognized the relevance of the TBL approach. In TBL, teachers' roles will need to evolve from being "dispensers of information and knowledge" to becoming "facilitators and enablers of learning" (Tawil, 2013).

Previous research conducted came up with the task cycles of TBL: First is the pre-task where the teacher explores the topic with the class (Al-shareef, 2012; Castillo, 2012; Dickey, 2012; Fathet & Chirachaimongkhonkhun, 2014; Formato, 2010). Also, the teacher guides students to understand the task instructions and prepare. Second is the big task cycle which is further subdivided into three: Task, the students at this point do the task either by pair or in small groups while the teacher acts as a monitor; Planning is where students prepare to report to the whole class (orally or in writing) how they did the task, what they decided or discovered; Reporting is where some groups present their reports to the class, or exchange written reports and compare results. Learners may receive feedback on their level of success in completing the task. The third phase involves the post-task, which is further divided into two: analysis and practice. In the analysis part, learners examine and discuss specific features of their task. After this, they practice what they discovered or learned. The teacher, this time, will conduct additional practice tasks for the students (Al-shareef, 2012; Castillo, 2012; Dickey, 2012; Fathet & Chirachaimongkhonkhun, 2014; Formato, 2010).

In addition, big tasks were included, which will serve as the binding theme for all the included small tasks in each chapter. Moreover, there would be background information about the task, the skills to be used, the major challenges, and the parameters to be considered in the small tasks.

Hand and hand with the principles and characteristics of a TBL, this paper used the ADDIE model in making the TBL material. ADDIE refers to Analysis, Design, Development,

Implementation, and Evaluation. Macaraeg (2014) stated that ADDIE provides a step-by-step process that enables instructional designers to plan and create training programs with a framework to make sure that their instructional products are effective and that their procedures are as efficient as possible.

Given the foregoing concepts, the researcher grounded this research on two reasons. First, research findings show that instructional material is a factor that hinders the achievements of learners in Mathematics. Mbugua et al. (2012) concluded that inadequate teaching and learning materials are one reason for a math learning difficulty. This finding was substantiated by Andaya (2014) when she found out that instructional factor is a problem that hinders Math learning among students. Gutfreund and Rosenberg (2012) discovered that among the influencing factors in the difficulty of understanding mathematics lies teacher-related ones such as instructional methods. Therefore, these research findings call for the development of additional materials to aid teachers and learners in the teaching-learning process. Second, most of the Business Mathematics references are of foreign setting; thus, it is not contextualized to Filipino learners. Rolka and Remshagen (2015) concluded that contextualized learning is beneficial for students' success.

Indeed, today's mathematics teaching is challenged by the onset of the new curriculum. Creativity, innovation, critical thinking, problem-solving, communication, and collaboration are all part of the 21<sup>st</sup> century math learning experience. The 21<sup>st</sup> century math classrooms are not just defined with program adoptions, learning resources, and online tools, but rather, they are defined by how the learning experience is brought to life. Understanding how instruction can be designed to develop 21<sup>st</sup> century knowledge and skills requires understanding the differences between "push" and "pull" learning (Krohn, 2015).



## Methodology

This research employed the descriptive development research method since it involves evaluation of the validity of instructional material in Business Mathematics for senior high school. The development method is used when developing effective products for use in a particular situation, in this case, in developing instructional material. This study used the five stages of the ADDIE model in the development of valid instructional material.

In the analysis phase, the scope of Business Mathematics for senior high school as prescribed by the Department of Education (DepEd) was determined. In the design and development phase, important factors were considered on the prints, illustrations, design and layout, paper and binding, and size and weight of the material. Lastly, the implementation and evaluation phases were not yet implemented. Nevertheless, the developed instructional material was subjected to validity evaluation by seven Grade 11 Mathematics teachers who have taught Business Mathematics and three experts from the different universities in Benguet. To be considered an expert, the mentor must have finished master's degree and must have taught Mathematics for the last five years

After careful writing and reproduction of the task-based material, the evaluators were given at least a month to assess the material in terms of content, face, presentation and organization, and accuracy, and up-to-datedness of data. Comments and suggestions of the evaluators were infused in revising the developed material. This study was limited only to the planning, designing, development, and revisions of instructional material. Pilot testing, implementation, and production were not included.

The Flesh Reading Ease Score was used to measure the task-based reading difficulty, while Gunning Fog Index, Coleman Liau Index, Flesch Kincaid Grade Level, Automated Readability Index, and Smog were used to measure the grade level of students who can understand the task-based material. These readability measures indicate if students can understand the developed task-based material in terms of the choice of words, length of sentences, and the number of characters.

To address the specific problems in the study, gathered data were analyzed accordingly using mean rating and readability index. Mean ratings were computed in the determination of the validity of the task-based material.

## Results and Discussion

### Extent of Validity of the Task-based Material in Business Mathematics

The evaluators assessed the task-based material in Business Mathematics along content, face, presentation and organization, and accuracy and up-to-dateness of data.

### Content Validity

Table 1 shows that the developed material has an overall mean of 4.68 along the content factor. This result means that the task-based material is considered highly valid regarding the topic and competencies covered in the book. This result is supported by the comments of evaluators in the following extracts:

#### Extract 1

*“At least ket ma meet jay objectives through the different lessons nga nainayon.”* (At least the objectives will be met through the lessons included).  
*“Mayat daytoy libro ta naiaramid jay lessons one after the other tapnu haan nga adu adu ti references.”* (This book is good because the lessons were sequenced one after the other so that overwhelming number of references are not needed).

These comments from the evaluators mean that the objectives set by the DepEd can be attained through the developed task-based material. Specifically, all the indicators for evaluating the content of the instructional material yielded a general “high validity” (OM=4.68) rating that speaks of the quality of the material.

The high indexes include (a) the task-based material fits the objectives (M=5.00); (b) content is suitable to the student's level of development (M=4.90); (c) task-based material contributes to the achievement of the specific objectives of the



**Table 1***Evaluation of the Task-Based Material Along Content*

<b>Indicators</b>	<b>Mean</b>	<b>DR</b>
1. The task- based material fits the objectives	4.90	HV
2. The task-based material contributes to the achievement of specific objectives of the subject area and grade level which it is intended	4.90	HV
3. Task-based material provides for the development of higher cognitive skills such as critical thinking, creativity, communication, Collaboration, learning by oing, inquiry, problem solving, etc.	4.90	HV
4. The task-based material provides sufficient repetition through examples and illustrations to enhance understanding of content.	4.60	HV
5. The difficulty of the learning exercises matches the abilities of the students	4.30	HV
6. The task-based material will keep the student on task	4.90	HV
7. The task-based material is free of ideological, cultural, religious, racial, and gender biases and prejudices	4.70	HV
8. Material enhances the development of desirable values and traits such as:	4.50	HV
8.1 Pride in being a Filipino		
8.2 Scientific attitude and reasoning		
8.3 Desire for excellence		
8.4 Love for country		
8.5 Helpfulness/ Teamwork Cooperation		
8.6 Unity		
8.7 Desire to learn new things		
8.8 Honesty and trustworthiness		
8.9 Ability to know right from wrong		
8.10 Respect		
8.11 Critical and creative thinking		
8.12 Productive work		
9. Learning package arouses interest of students	4.60	HV
10. Adequate warning/cautionary notes are provided in topics and activities where safety and health are concern	4.50	HV
11. Learning package provides opportunities for students to use technology	4.30	HV
<b>Overall Mean</b>	<b>4.68</b>	<b>HV</b>

Legend:

<i>Weighted Mean</i>	<i>Descriptive Rating</i>
4.20 – 5.00	Highly Valid (HV)
3.40 – 4.19	Valid (V)
2.60 – 3.39	Moderately Valid (MV)
1.80 – 2.59	Fairly Valid (FV)
1.00 – 1.79	Poorly Valid (PV)



subject area and grade level which it is intended (M=4.90); (d) task-based material provides for the development of higher cognitive skills such as critical thinking, creativity, communication, collaboration, learning by doing, inquiry, problem-solving, etc. (M=4.90); and (e) the task-based material will keep the students on task (M=4.90). The high rating can be attributed to the fact that the developed material included all the topics in Business Mathematics required by the Department of Education. Meanwhile, though high validity indexes were posted, the following indicators may need to be improved in the future revision of the material: (a) task-based material is free of ideological, cultural, religious, racial, and gender biases and prejudices (M=4.70); and (b) the material enhances the development of desirable values and traits such as pride in being a Filipino, scientific attitude and reasoning, desire for excellence, love for country, helpfulness/teamwork/cooperation, unity, desire to learn new things, honesty and trustworthiness, ability to know right from wrong, respect, critical and creative thinking, and productive work (M=4.50).

Notwithstanding, the high rating given to the content of the instructional material attests to the consideration given by the instructional material developer in designing the topics and competencies aligned to the DepEd standards and which has a high level of engagement given the “task-based” nature of the material. Likewise, the material promoted experiential learning by using authentic texts and contextualized/localized materials in an environment/situation familiar to learners. As Yardley et al. (2012) mentioned, experiential learning is constructed knowledge and meaningful real-life experiences and students should be meaningfully involved in their learning through interactive and worthwhile tasks reflective of the Engagement Theory as a foundation of the task-based material developed.

### Face Validity

It can be seen in Table 2 that generally, the face validity of the developed instructional material was rated high (M=4.73). Specifically, all the indicators for evaluating the face of the instructional material yielded “high validity” ratings that speak of the quality of the instructional material as far as its face is concerned.

The high indexes (M=4.60–5.00) include (a)

ease of handling and relative lightness of the material; (b) appropriateness of font style and size, ease of reading, spacing, & printing quality; (c) attractive and pleasing design and layout, simple, and adequate illustration about the text, and harmonious blending of elements; (d) easy reading and durable binding to stand frequent use; (e) illustrations that are simple and easily recognizable; clarify and supplement the text; culturally relevant, attractive, appealing, properly labeled or captioned (if applicable), and use of realistic/appropriate colors. Of all the indicators, the appropriateness of the size of the letter to the intended reader and the easy readability of the font was rated the highest (M=5.00). Notwithstanding, while the ratings were generally considered very high, this does not hinder revision of the material if necessary. As Mayers’ multimedia principle states, “instructional materials must include words and graphics for it to be conducive to learning.”

### Presentation and Organization

The presentation and organization of data included five indicators. It is evident in Table 3 that the material was rated highest in terms of its presentation of concepts (M=4.80), characterized as interesting, and understandable. The evaluators said that the task-based material is engaging because it included contextualized tasks in all five chapters. It was noted that as the lessons progressed, students were taught how to accomplish their small tasks thereby giving them opportunities to master the concepts they had learned. Also, localized contexts were included in the different small tasks and problem-solving abilities that arouse the interest of students.

The evaluators also noted evidence of the appropriateness of vocabulary adapted to the student’s experience and understanding (M=4.70) and that the length of sentences is suited to the level of the students (M=4.70) based on the very high ratings given.

Notwithstanding, while the ratings for indicators 2 and 5 are still very high, there are areas for improvement for the succeeding revision of the material; that is, there may be a need to polish further the logical flow of ideas (M=4.50) and to make the sentence and paragraphs structures more varied and interesting to the students if needed (M=4.50).



**Table 2***Evaluation of Face Validity of the Task-Based Material*

<b>Indicators</b>	<b>Mean</b>	<b>DR</b>
1. Prints	4.73	HV
1.1 Size of the letters is appropriate to the intended reader	5.00	HV
1.2 Spaces between letters and words facilitate reading	4.60	HV
1.3 Font is easy to read	5.00	HV
1.4 Printing is of good quality (i.e., no broken letters, even density, correct alignment, properly placed screen registration)	4.30	HV
2. Illustrations	4.68	HV
2.1 Simple and easily recognizable	4.80	HV
2.2 Clarify and supplement the text	4.80	HV
2.3 Properly labeled or captioned (if applicable)	4.60	HV
2.4 Realistic/ appropriate colors	4.40	HV
2.5 Attractive and appealing	4.70	HV
2.6 Culturally relevant	4.80	HV
3. Design and Lay-out	4.73	HV
3.1 Attractive and pleasing to look at	4.90	HV
3.2 Simple (i.e., does not distract the attention of the reader)	4.90	HV
3.3 Adequate illustration in relation to the text	4.60	HV
3.4 Harmonious blending elements	4.50	HV
4. Paper and Binding	4.73	HV
4.1 Paper used contributes to easy reading	5.00	HV
4.2 Durable binding to stand frequent use	4.70	HV
5. Size and Weight of Supplemental Material	4.85	HV
5.1 Easy to handle	4.90	HV
5.2 Relatively Light	4.70	HV
<b>Overall Mean</b>	<b>4.73</b>	<b>HV</b>

*Legend:*

<i>Weighted Mean</i>	<i>Descriptive Rating</i>
4.20 – 5.00	<i>Highly Valid (HV)</i>
3.40 – 4.19	<i>Valid (V)</i>
2.60 – 3.39	<i>Moderately Valid (MV)</i>
1.80 – 2.59	<i>Fairly Valid (FV)</i>
1.00 – 1.79	<i>Poorly Valid (PV)</i>

As a whole, the overall mean of 4.64 indicates the material's high validity as far as presentation and organization are concerned. Evaluators commented that the presentation and organization of the task-based material are so different from the references they are using. They added that the task-based material is helpful to students because spaces were provided to write on solutions, students may also have advanced reading

and can answer exercises ahead so they can ask questions during discussions. Moreover, some evaluators commented that while the task-based material adds work to teachers because they need to check each of the students' answers, they mentioned that the task-based material is helpful to students because they will be answering the different questions on their own at their own pace.



**Table 3***Evaluation of the Task-Based Material Along Presentation and Organization*

<b>Indicators</b>	<b>Mean</b>	<b>DR</b>
1. Presentation is engaging, interesting, and understandable	4.80	HV
2. There is logical and smooth flow of ideas	4.50	HV
3. Vocabulary level is adapted to target reader's experience and understanding	4.70	HV
4. Length of sentences is suited to the comprehension level of the students	4.70	HV
5. Sentences and paragraph structures are varied and interesting to the students	4.50	HV
<b>Overall Mean</b>	<b>4.64</b>	<b>HV</b>

Legend:

<i>Weighted Mean</i>	<i>Descriptive Rating</i>	
4.20 – 5.00	Highly Valid	(HV)
3.40 – 4.19	Valid	(V)
2.60 – 3.39	Moderately Valid	(MV)
1.80 – 2.59	Fairly Valid	(FV)
1.00 – 1.79	Poorly Valid	(PV)

As the evaluators said:

Extract 3

*"Mayat ta adda ti space nga pangsuratan ti eskwela ti answers da."*

(It is good that spaces are provided for students to write their answers). *"Ma arouse ti interest ti eskwela ta localized jay problems ket makarelata da."* (The interest of students is aroused because the problems are localized and they can relate to it). *"With the problems given ngay ket makita ti eskwela ti kaimportansiya na nga talaga ti Math."* (With the problems given, the students will see the importance of Math).

Indeed, the material reinforces learning supporting what Bolstad and Gilbert (2012) mentioned that teachers will need to reinforce learners' intellectual curiosity, problem identification, and problem-solving skills, and their capacity to construct new knowledge with others.

#### **Accuracy and Up-to-Dateness of Data**

The evaluation of the developed task-based material along accuracy and up-to-dateness of data is presented in Table 4. From the table, it can be inferred that the material was rated highest in terms of the absence of conceptual errors

(M=4.80), followed by factual errors and the presence of obsolete information (M=4.70). Meanwhile, the material was rated lowest in terms of grammatical errors and typographical and other minor errors (M=4.20).

Among the typographical errors noticed by the evaluators include misspelled words, misuse of upper and lower case letters, and missing labels. Notwithstanding, all these minor errors were checked in the revised copy of the task-based material. Overall, the task-based material has a validity index of 4.60 which can be concluded as "high". Ferguson (2009) mentioned that giving accurate and updated problems to students will maintain their interest in learning, hence, the succeeding revision of the instructional material will require going over the accuracy and up-to-dateness of the material to reduce errors and obsolescence of the material as noted.

As per evaluation, the material was rated highest in its face validity (M=4.73); and lowest for accuracy and up-to-datedness of data (M=4.60). Notwithstanding, the parameter ratings and the overall rating (M=4.66) indicate a very "high" validity index of the developed instructional material.

#### **Readability of the Task-based Material**

As another means of establishing the validity/quality of the material, the task-based material



has undergone readability testing. The Test Document Readability- online utility was used to measure the readability of the developed task-based material. The online-generated utility measures the reading difficulty and the grade level of students who are supposed to understand the text. Table 5 shows the readability scores with the

suggested grade level that can comprehend the task-based material. The Flesh Reading Ease Score was used to measure the task-based reading difficulty, while Gunning Fog index, Coleman Liau Index, Flesch Kincaid Grade Level, Automated Readability Index, and Smog were used to measure the grade level of students who can understand

**Table 4**

*Evaluation of the Task-Based Material Along Accuracy and Up-To-Datedness of Data*

<b>Indicators</b>	<b>Mean</b>	<b>DR</b>
Absence of:		
1. Conceptual Errors	4.80	HV
2. Factual errors	4.70	HV
3. Grammatical errors	4.50	HV
4. Computational errors	4.70	HV
5. Obsolete information	4.70	HV
6. Typographical and other minor errors (e.g., inappropriate or unclear illustrations, missing labels, wrong captions, etc.)	4.20	HV
<b>Overall Mean</b>	<b>4.60</b>	<b>HV</b>

Legend:

<i>Weighted Mean</i>	<i>Descriptive Rating</i>	<i>Weighted Mean</i>	<i>Descriptive Rating</i>
4.20 – 5.00	Highly Valid (HV)	1.80 – 2.59	Fairly Valid (FV)
3.40 – 4.19	Valid (V)	1.00 – 1.79	Poorly Valid (PV)
2.60 – 3.39	Moderately Valid (MV)		

**Table 5**

*Readability Indexes of the Task-Based Material*

		<b>Chapters</b>					<b>Mean</b>	<b>Grade Level</b>
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>		
Score	Flesh Reading Ease Score	82.38	9.13	68.74	76.27	73.08	77.91	7 <sup>th</sup> grade
U.S. Grade	Flesh Kincaid Grade Level	5.50	3.16	5.98	5.46	5.59	5.14	5 <sup>th</sup> grade
	Gunning Fog Index	7.43	5.07	7.03	8.32	7.35	7.04	7 <sup>th</sup> grade
	Coleman Liau Index	4.33	3.02	7.60	5.33	5.39	5.23	5 <sup>th</sup> grade
	Automated Readability Index	3.75	0.87	4.52	3.68	2.96	3.16	3 <sup>rd</sup> grade
	Smog Index	7.33	6.40	8.48	9.71	9.32	8.25	8 <sup>th</sup> grade

Legend: *Flesh Reading Ease Scoring Key*

<i>Range</i>	<i>Descriptive Rating</i>	<i>Range</i>	<i>Descriptive Rating</i>
0 – 29	Very Confusing	70 – 79	Fairly Easy
30 – 49	Difficult	80 – 89	Easy
50 – 59	Fairly Difficult	90 – 100	Very Easy
60 – 69	Standard		



the task-based material. The readability measures indicate if students can understand the developed task-based material in terms of the choice of words, length of sentences, and the number of characters.

The Flesch Reading Ease Score of the developed task-based material is 77.91 which can be interpreted as “fairly easy to read”. The grade level indicators can be interpreted in such a way that the instructional material is comprehensible to at least 5<sup>th</sup> graders. It can be concluded that the words used in the developed task-based material were simple and understandable to even Grade 5 students.

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### Conclusions

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Based on the study results, it is concluded that the developed task-based material in Business Mathematics is highly valid. Also, the developed task-based material has a fairly easy level of difficulty in terms of its readability and is comprehensible to at least Grade 5 students.

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### Recommendations

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In the quest for providing a quality learning material, it is recommended that the material be subjected to pilot testing, vetting, approval, and IPR application; the developed task-based material be adopted by Business Mathematics teachers as a worktext or as supplementary material; and since the readability of the developed task-based material has an easy level of difficulty in terms of its readability and is comprehensible to at least Grade 5 students; the use of deeper words and vocabularies be considered to make the material be aligned to the level of the target audience and to make the learning more challenging to learners.

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## Appendix A

### Features of the Task-Based Material in Business Mathematics

Each chapter has big task, chapter goals, chapter overview, mathematics expectations, small tasks to be completed, timelines, and submission of small tasks, major curricular competencies, assessment, cross-curricular links, general format, differentiation, lessons, chapter summary, and chapter exercises.



The **Big Task** section serves as a concluding task. The big task serves as the theme of the exercises included in the different chapters. Moreover, it guides students on what needs to be accomplished at the end of the chapter;



The **Chapter Goals** section details what needs to be achieved during and after the discussion of a topic in a chapter;



The **Chapter Overview** presents the general description of the lessons included in the chapter;



The **Mathematics Expectation** reflects the potentials and attributes that students must exhibit at the end of each chapter;



The **Number of Task** to be submitted and the **Timeline of Small Task** provides the specifics (how many tasks will be passed, number of weeks to finish the task/s, and when to submit the completed task/s) of the small task/s;



The **Major Curricular Competencies** are attributes that students are supposed to exhibit based on the Department of Education curriculum guide;



The **Assessments** section includes formative and summative. The formative assessment is the observation done before, during, and after a small task is finished while summative assessment is the final marking of the small task;



The **Cross Curricular Link** associates students' task/s to technology, different mediums, importance of doing such activity, and personal choices of planning, designing, and making personal choices in regards to the task/s given;



The **General Format** itemizes the general timeline, the number of minutes for a math block in a week, the work block where students may ask the assistance of teacher/classmate, the number of mini-lesson in a week that students need to participate, and the teacher responsibilities;



The **Differentiation** section provides students an opportunity for peer teaching and provision to redo/correct unfinished task during math block;



The **Mini-Lesson** section is a short discussion of the topic to prepare students on how to do the computations needed in doing the tasks;





The **Small Tasks** are also included after selected mini-lessons. The small tasks are series of activities that enable students to master the concepts they need to learn and apply. Furthermore, the small tasks serve as avenue for students to bring out their creativity in presenting outputs and a way of honing their skills in computing, graphing, and budgeting capabilities. As Ferguson (2009) states, the giving of varied tasks to students will maintain their interest in learning;



The **Chapter Summary** condenses the useful ideas that students must learn and apply;



The **Chapter Exercise** section consists of varied problems on the different topics within the chapter that students will answer, thereby allowing students to master the concepts learned.

