

Development and evaluation of multiple intelligence-based differentiated instructional material for reading and writing

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Abstract

'One-size-fits-all' is a ridiculous statement. Every individual is unique in his or her special way. However, in education, the usual approach is to clamp the learners based on their age, gender or level of achievement. Even though education has entered the new normal, learners are still using the one-size-fits-all material. As teachers, the researchers opted to design and develop instructional materials that could cater to the needs of the learners while tapping their interest to keep them motivated. The researchers utilised Quipper, an online learning management system, as a platform to develop differentiated instructional materials based on multiple intelligence profiles of the grade 11 students in Cainta Senior High School. The respondents of this study were the grade 11 students and humanities and social sciences English teachers who were purposively selected to evaluate the developed instructional materials and be the source of data. This study employed a quantitative method to determine the multiple intelligence profiles of the grade 11 students and evaluate the 2 groups of respondents. Based on the results, most of the learners possess five prominent bits of intelligence. Both the student and teacher respondents believe that the developed differentiated instructional material has realistic/authentic content, promotes autonomy or independent learning, written using clear and simple language and has inputs and elements that are useful for distance learning. It is recommended that teachers adapt the strategy of developing differentiated materials and the utilisation of different available platforms to help the learners cope in the new normal.

Keywords: Multiple intelligence, instructional material, Development, evaluation, teacher

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1. Context and rationale

'One-size-fits-all' is a ridiculous statement. Every individual is unique in his or her own special way. However, in education, the usual approach is to clamp the learners based on their age, gender or level of achievement. The number of learners inside the classroom is sometimes overwhelming for the teachers that sometimes lead them to resort to the one-size-fits-all approach (Strauss, 2016).

For teachers, it is another day of getting through the noble work of teaching while trying to minimise the gaps. For learners, it means the loss of creative and flexible differentiation – instruction tailored to each child's social, emotional and academic needs. Applying 'differentiated instruction' can help address the needs of academically diverse learners in our increasingly diverse classrooms (Tomlinson & Allan, 2020; Kaushik, 2017).

In the new normal, the educational system has migrated from face-to-face to different learning modalities. As per DepEd Order Number 12 series of 2020, there will be no face-to-face classes until it is safe. The Department of Education through the learning continuity plan introduced the different learning modalities, namely online distance learning (ODL), printed modular distance learning and digitised modular distance learning.

The teacher creates the learning modules that students will use at the local level. Parents should be aware of how to maximise learning from these educational packages. It has become a challenge for the teachers to develop materials to keep up with the needs of the learners (Angara, 2020). Left with no choice, the learners have to deal with the same modules and activities or tasks. Learners lean on the learning resource or modules, which could help them perform self-pace learning or sometimes under the tutelage of their parents or guardians. In a classroom set-up, it has been a difficult thing for learners to be motivated due to their attention span and other factors. Now, the teachers are not present right in front of them as they answer their learning tasks (Ugwuanyi, 2020).

Time allotted to ODL is also limited. Instructions through chat and voice calls are sometimes insufficient to help the learners. As classes are mostly carried out online, parents and teachers agree that the challenge in learning under the new normal goes beyond the strength of one's Internet connection (Abatayo, 2020).

Although the modules are populated with a lot of activities, they cannot replace the unique experience of learning using specially designed material for personal needs and/or intelligence. The multiple intelligences go beyond learning modalities, as they deal with the way information is processed and how learning occurs in individuals (Scholastic.com, 2020). By integrating the theory of multiple intelligences in e-learning, whether synchronous or asynchronous, it could provide several opportunities for the learners to understand the lessons (Mankad, 2015).

2. Innovation, intervention and strategy

As teachers, the researchers opted to design and develop instructional materials that could cater to the needs of the learners while tapping their interest to keep them motivated. The researchers considered the multiple intelligences of the learners in developing instructional materials for reading and writing. The researchers utilised Quipper, an online learning management system, as a platform to develop differentiated instructional materials based on the multiple intelligence profiles of the grade 11 students in Cainta Senior High School.

With high hopes, this study aims to contribute to the existing repertoire of instructional materials that cater to differentiation even in the midst of the pandemic or the new normal.

3. Action research questions

1. What are the multiple intelligence profiles of grade 11 students in Cainta Senior High School?
2. What is the evaluation of the student respondents in the developed multiple intelligence-based differentiated instructional materials for reading and writing in terms of authenticity, autonomy, clarity and usefulness?
3. What is the evaluation of the teacher respondents in the developed multiple intelligence-based differentiated instructional materials for grade 11 reading and writing in terms of authenticity, autonomy, clarity and usefulness?

4. Are there significant differences between the evaluations of the two groups of respondents in the developed multiple intelligence-based differentiated instructional materials for reading and writing in terms of the aforementioned variables?

5. What are the suggestions of the respondents to further improve the developed multiple intelligence-based differentiated instructional materials for reading and writing?

4. Significance of the study

This study is expected to benefit the following:

4.1. Learners

The developed multiple intelligence-based differentiated instructional materials for reading and writing may help them understand the lesson in the said subject. The said material could provide them multiple opportunities to learn as it considers their intelligence or interest.

4.2. Teachers

The result of this study may help them realise that education must not be hindered even in the midst of the pandemic. They may realise that their limitless creativity may help the learners especially in times when they are not in front of their students to explain the lesson.

5. Action research methods

5.1. Participants

This study involved 100 grade 11 ODL learners and 6 HUMSS English teachers. The respondents were purposively selected since they are the ones who will benefit from the result of the study and the developed instructional materials.

5.2. Data gathering procedure

The researchers adapted a multiple intelligence profile inventory survey questionnaire to determine the multiple intelligences of the learners. The researchers transferred the instrument or survey form in a Google Form to conduct the survey online. The researchers then conducted a survey on grade 11 ODL learners through their ODL teachers by sending them the link of the Google Form.

Upon receiving all the responses of the learners, the researchers extracted the data from the Google Form and computed for the weighted mean of each intelligence. As the researchers identified the most prominent intelligences of the students, they designed and developed materials in Quipper.

The researchers designed a survey questionnaire in Google Form for the evaluation of the learners and teachers on the developed instructional materials.

The researchers presented the developed instructional materials to grade 11 ODL students and HUMSS English teachers. Finally, the researchers sent the survey questionnaire to the students and teacher respondents to evaluate the developed instructional materials.

5.3. Data analysis

To determine the multiple intelligence profiles of the learners, weighted mean was utilised.

To determine the evaluation of the two groups of respondents in the developed instructional materials, weighted mean was used.

To determine the significant difference between the evaluations of the two groups of respondents, z-test was employed.

6. Discussion of the results

Table 1. The multiple intelligence profiles of grade 11 students

Rank	Multiple intelligence	Total average weighted mean	Verbal interpretation
1	Verbal	3.63	Very often
2	Spatial	3.59	Very often
3	Interpersonal	3.58	Very often
4	Existentialist	3.55	Very often

5	Logical	3.51	Very often
6	Naturalist	3.44	Often
7	Bodily kinaesthetic	3.42	Often
8	Intrapersonal	3.36	Often
9	Musical	3.24	Often

Table 1 shows that the most prominent intelligences are verbal, spatial, interpersonal, existentialist and logical, with weighted means of more than 3.5, respectively, and interpreted very often. On the other hand, the learners also use naturalist, bodily kinaesthetic, intrapersonal and musical intelligences.

Table 2. The evaluation of grade 11 students on the developed instructional materials in terms of authenticity

Authenticity	Weighted mean	Verbal interpretation
Has materials that feature realistic content	4.33	Agree
Has inputs that require the learners to apply their contextual knowledge	4.55	Strongly agree
Has inputs that match students' learning needs and interest	4.68	Strongly agree
Has content developed within the subject matter and its competencies	4.33	Agree
Has topics developed within the level of students' knowledge and communicative competence	4.45	Agree
Total average weighted mean	4.47	Agree

Based on Table 2, the learners agree that the developed instructional materials have realistic content, within the subject matter and its competencies, and have topics developed within the level of students' knowledge. Moreover, the learners strongly agree that the materials have inputs that require contextual knowledge and match the learners' needs and interests, with weighted means of 4.55 and 4.68, respectively.

Table 3. The evaluation of grade 11 students on the developed instructional materials in terms of autonomy

Autonomy	Weighted mean	Verbal interpretation
Promotes independent learning	4.43	Agree
Has activities that can be performed independently	4.28	Agree
Has materials that can be used to learn at users' own pace	4.40	Agree
Promotes self-directed learning	4.23	Agree
Total average weighted mean	4.33	Agree

Table 3 shows the evaluation of grade 11 students on the developed instructional materials in terms of autonomy. The learners agree that the developed instructional materials promote independent, self-paced and self-directed learning.

Table 4. The evaluation of grade 11 students on the developed instructional materials in terms of clarity

Clarity	Weighted mean	Verbal interpretation
Content is written using simple language	4.55	Strongly agree
Materials are written using simple words and expressions	4.40	Agree
Contents are written within the organisation of the lessons	4.58	Strongly agree
Directions and activities are easy to understand and follow	4.48	Agree
Logically arranged based on the learning competencies	4.40	Agree
Total average weighted mean	4.48	Agree

Table 4 shows the evaluation of grade 11 students on the developed instructional materials in terms of clarity. The learners strongly agree that the content is written using simple language and within the organisation of the lesson, with weighted means of 4.55 and 4.58, respectively. Furthermore, the

students believe that the materials were written using simple language and arranged based on the learning competencies.

Table 5. The evaluation of grade 11 students on the developed instructional materials in terms of usefulness

Usefulness	Weighted mean	Verbal interpretation
The inputs and the elements were relevant and up to date	4.53	Strongly agree
The content and assessment materials are suited to the needs of the students	4.50	Strongly agree
The LMS can help the students understand the text better	4.38	Agree
The LMS is appropriate in the teaching and learning of the subject	4.43	Agree
The LMS serves as an effective tool in incorporating lessons in reading and writing	4.48	Agree
Total average weighted mean	4.46	Agree

Table 5 shows the evaluation of grade 11 students on the developed instructional materials in terms of usefulness. The students strongly agree that the inputs and elements were relevant and up to date as well as the content and assessment materials are suited to their needs. Likewise, the learners agree that the learning management system can help them understand the text better, is appropriate in the teaching and learning of the subject and serves as an effective tool in incorporating lessons in reading and writing.

Table 6. The evaluation of HUMSS English teachers on the developed instructional materials in terms of authenticity

Autonomy	Weighted mean	Verbal interpretation
Has materials that feature realistic content	4.83	Strongly agree
Has inputs that require the learners to apply their contextual knowledge	5.00	Strongly agree
Has inputs that match students' learning needs and interest	4.83	Strongly agree
Has content developed within the subject matter and its competencies	4.83	Strongly agree
Has topics developed within the level of students' knowledge and communicative competence	5.00	Strongly agree
Total average weighted mean	4.90	Strongly agree

Table 6 shows the evaluation of HUMSS English teachers on the developed instructional materials in terms of authenticity. The teacher respondents strongly agree that the developed instructional materials have realistic content, require contextual knowledge application, match the needs and interests of the learners and are within the subject matter and level of students' knowledge.

Table 7. The evaluation of HUMSS English teachers on the developed instructional materials in terms of autonomy

Autonomy	Weighted mean	Verbal interpretation
Promotes independent learning	5.00	Strongly agree
Has activities that can be performed independently	5.00	Strongly agree
Has materials that can be used to learn at users' own pace	4.83	Strongly agree
Promotes self-directed learning	4.83	Strongly agree
Total average weighted mean	4.92	Strongly agree

Table 7 shows the evaluation of HUMSS English teachers on the developed instructional materials in terms of autonomy. Generally, the teacher respondents believe that the developed instructional materials promote independent, self-paced and self-directed learning.

Table 8. The evaluation of HUMSS English teachers on the developed instructional materials in terms of clarity

Clarity	Weighted mean	Verbal interpretation
Content is written using simple language	5.00	Strongly agree
Materials are written using simple words and expressions	4.83	Strongly agree
Contents are written within the organisation of the lessons	4.83	Strongly agree
Directions and activities are easy to understand and follow	4.67	Strongly agree
Logically arranged based on the learning competencies	4.83	Strongly agree
Total average weighted mean	4.83	Strongly agree

Based on Table 8, the teacher respondents strongly agree that the content is written using simple language and directions that are easy to follow and understand; the content is logically arranged; and it is written according to the organisation of the lesson.

Table 9. The evaluation of HUMSS English teachers on the developed instructional materials in terms of usefulness

Usefulness	Weighted mean	Verbal interpretation
The inputs and the elements were relevant and up to date	4.33	Agree
The content and assessment materials are suited to the needs of the students	4.67	Strongly agree
The LMS can help the students understand the text better	4.33	Agree
The LMS is appropriate in the teaching and learning of the subject	4.67	Strongly agree
The LMS serves as an effective tool in incorporating lessons in reading and writing	4.50	Strongly agree
Total average weighted mean	4.50	Strongly agree

Table 9 shows the evaluation of HUMSS English teachers on the developed instructional materials in terms of usefulness. The teachers strongly agree that the content was relevant and updated; the LMS is appropriate in teaching and learning the subject; and it serves as an effective tool in incorporating lessons in reading and writing.

Table 10. The evaluation of the two groups of respondents on the developed instructional materials in terms of authenticity

Authenticity	Students	Teachers
Mean	4.465	4.9
Known variance	0.022687	0.008333
Observations	5	5
z	-5.522724288	
z Critical (one-tailed)	1.644853627	
z Critical (two-tailed)	1.959963985	

Table 10 shows that the Z-value of -5.52 is less than the value of z Critical, which is 1.96 . Therefore, the null hypothesis stating that there is no significant difference between the evaluations of two groups of respondents on the developed multiple intelligence-based differentiated instructional materials in terms of authenticity is accepted.

Table 11. The evaluation of the two groups of respondents on the developed instructional materials in terms of autonomy

Autonomy	Students	Teachers
Mean	4.33125	4.916666667

Known variance	0.00932	0.006944
Observations	4	4
z	-9.180818366	
z Critical (one-tailed)	1.644853627	
z Critical (two-tailed)	1.959963985	

Table 11 shows that the Z-value of -9.18 is less than the value of z Critical, which is 1.64 . Therefore, the null hypothesis stating that there is no significant difference between the evaluations of two groups of respondents on the developed multiple intelligence-based differentiated instructional materials in terms of autonomy is accepted.

Table 12. The evaluation of the two groups of respondents on the developed instructional materials in terms of clarity

Clarity	Students	Teachers
Mean	4.48	4.5
Known variance	0.006687	0.013888
Observations	5	5
z	-5.508073042	
z Critical one-tail	1.644853627	
z Critical two-tail	1.959963985	

Table 12 shows that the Z-value of -5.51 is less than the value of z Critical, which is 1.96 . Therefore, the null hypothesis stating that there is no significant difference between the evaluations of two groups of respondents on the developed multiple intelligence-based differentiated instructional materials in terms of clarity is accepted.

Table 13. The evaluation of the two groups of respondents on the developed instructional materials in terms of usefulness

Usefulness	Students	Teachers
Mean	4.46	4.5
Known variance	0.00363	0.02778
Observations	5	5
z	-0.504674109	
z Critical one-tail	1.644853627	
z Critical two-tail	1.959963985	

Table 13 shows that the Z-value of -0.50 is less than the value of z Critical, which is 1.96 . Therefore, the null hypothesis stating that there is no significant difference between the evaluations of two groups of respondents on the developed multiple intelligence-based differentiated instructional materials in terms of autonomy is accepted.

7. Comments and suggestions for further improvement

7.1. Trainings/LAC sessions

The teacher respondents suggested that there should be training or a LAC session on utilising the LMS like Quipper. It will also be a good avenue to share knowledge on developing instructional materials for online platforms.

7.2. Easiest instructions or directions

The student respondents suggested that the materials uploaded to the online platforms should have the easiest instructions or directions. Due to distance learning, the teachers might not be able to answer all the queries posted, but if the material has a crystal-clear direction, then learners will be able to perform their task independently.

8. Conclusion

1. Grade 11 Cainta Senior High School students possess different intelligences that teachers may cater to as they prepare instructional material.

2. The learners and teachers believe that the developed instructional material are authentic, clear, useful and promote autonomy in learning.

3. Generally, there is no significant difference between the evaluation of the students and teachers on the developed instructional material. In light of the findings, it is safe to conclude that multiple intelligence-based differentiated instructional materials can be used in teaching reading and writing as a supplementary material.

4. The developed multiple intelligence-based instructional materials are useful in the new normal.

9. Recommendations

1. Teachers may opt to initiate a LAC session or training by utilising different LMS or online platforms to carry out differentiated instruction even in the new normal.

2. Teachers may find ways to assess the strengths and weaknesses of the learners to address their needs and interests, especially during these times of distance learning. By this, students might become more motivated to learn in the absence of teachers physically.

10. Reflection/action plan

In light of the findings of the study, the researchers propose the following course of action:

1. Present the developed instructional material to the faculty members of Cainta Senior High School during the mid-year in-service training to introduce a way of implementing differentiated instruction in the new normal.

2. Encourage the faculty members to adapt the utilisation of different LMS as platforms to perform differentiated instruction.

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