

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY: APPLIED BUSINESS AND EDUCATION RESEARCH

2022, Vol. 3, No. 8, 1499 – 1507

<http://dx.doi.org/10.11594/ijmaber.03.08.12>

Research Article

Improving the Selected Life Science Competencies of Grade 11 Learners with Special Needs through Parent - Assisted Learning Plan

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Article history:

Submission August 2022

Revised August 2022

Accepted August 2022

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ABSTRACT

COVID-19 has transformed education delivery and doubled the challenges of learners with special needs (LSEs) due to inaccessible assistive technologies and limited face-to-face interaction with special education teachers. Consequently, their parents were forced to teach without formal training (World bank, 2020). Thus, this sequential mixed method study aimed to improve the learners' selected Life Science competencies in animal reproduction, genetic engineering, animal survival, and evolution through Parent-Assisted Learning Plan (PALP). The PALP is a 3-week home instruction cycle introduced to the participants where the teacher who created the self-learning modules met one-on-one with the home learning facilitators (HLFs) to discuss the various concepts covered in the modules emphasizing real-world applications and demonstrating strategies in teaching the concepts to the participants at home. Six Grade 11 LSEs from Ferdinand E. Marcos Senior High School participated in this study. The data came from validated 50-item teacher-created tests and focus group discussions. Frequency, percentage, means, and t-test was used to analyse quantitative data, while thematic analysis was applied for qualitative data. The t-test results show that PALP effectively improves learners' selected Life Science competencies. However, the participants also faced problems, including the difficulty of lessons, poor information retention, and a lack of formal sign language training among home learning facilitators. It is then recommended that schools may adopt and implement the PALP to help LSEs cope with the new learning delivery.

Keywords: *home learning facilitators, learners with special needs, life science, parent-assisted learning plan, sequential mixed method action research design*

How to cite:

Sagnep, J. M. T. & Valencia, M. J. L. (2022). Improving the Selected Life Science Competencies of Grade 11 Learners with Special Needs through Parent - Assisted Learning Plan. *International Journal of Multidisciplinary: Applied Business and Education Research*. 3 (8), 1499 – 1507. doi: 10.11594/ijmaber.03.08.12

Introduction

The Coronavirus disease (COVID-19) outbreak has added new challenges and uncertainty to the Philippine basic education system. As a result, schools' ability to provide quality education to all students has been negatively affected. However, continuous schooling has been made possible due to educational measures and policies, most notably the adaptation of the Department of Education's Basic Learning Continuity Plan. The department specifically directed schools to facilitate student instruction during the crisis by utilizing various learning modalities appropriate to their local contexts. Hence, teachers and students switched the delivery of their lessons in virtual classrooms, printed modules, and the like.

While alternative modes of delivery are being considered in the Philippines to meet educational needs, learners with special needs (LSEs) and disabilities face additional challenges due to equipment, internet access, and specialized learning materials. Accordingly, the World Bank (2020), widespread school closures have deprived (LSEs) access to assistive technologies and face-to-face interaction with special education teachers. Consequently, COVID-19 has shifted the role of parents to teachers, exacerbating the digital divide between learners regarding access to equipment, electricity, and the internet.

Additionally, despite the government's efforts to address the fundamental educational challenges associated with COVID-19, the grassroots struggled to adjust to the new mode of instruction. In light of this, Mohammed (2020) eloquently stated that teachers would face similar difficulties communicating virtually with deaf students as they do with visually impaired students who are typically not assisted. As a result, LSEs bears the brunt of educational consequences.

Similarly, the researchers noted that dealing with special needs students in the new learning delivery challenges Senior High School teachers. They struggled to help these students understand lessons and activities because it was their first encounter with students with disabilities, and teachers had never received formal special education. Moreover, these students were also given the same modules as

regular students in the mainstream classroom, which coincides with inclusive education. Thus, the no-child-left-behind and delivering quality education goals seemed to have not been attained.

Furthermore, the health crisis has pressured educators to enhance their pedagogies and activities to make their subject matter more engaging in virtual classrooms or printed modules. However, teaching science and fostering scientific literacy, particularly at the senior high school level, is not always straightforward due to the complexity of the concepts and theories. Furthermore, conducting laboratory work virtually is perplexing for teachers and students. As a result, science teachers have been pressed to be more creative, resourceful, and innovative in their approaches to ensure that the most critical learning competencies are implemented correctly.

To assist the LSN in learning science in this new normal, Brossard et al. (2020) asserted that parental involvement is critical for remote learning, which is designed to allow students to continue learning but within the confines of the home. Likewise, Magsambol (2020) emphasized the importance of actively participating in the distance learning process. They would guide and assist their children as they transitioned to the alternative mode of instruction. Perera (2014) confirmed that home and family significantly impact students' science learning and attitudes toward science. Thus, with adequate parental supervision, LSEs can continue learning throughout the pandemic.

Fortunately, one of the interventions that complement the needs of the LSEs in the modular set-up is the Parent-Assisted Learning Plan (PALP). Designed by Niedermeyer (1969), PALP enables school personnel to establish a system in which parents effectively educate their children at home about fundamental skills and concepts.

The PALP intervention is premised on Vygotsky's Zone of Proximal Development (ZPD). The ZPD is the gap between a learner's ability to complete a task with adult guidance and peer collaboration and their ability to complete the task independently (Vygotsky, 1978). When a student is in the ZPD for a learning task, appropriate assistance will help them achieve

it. ZPD is thus essential in the teaching-learning process to meet the needs of learners in a modular setting. Also, relevant parental involvement will help these students improve in Life Sciences. As a result, the researchers decided to conduct a study on improving the competence of Grade 11 LSENs on the selected topic of Life Science through PALP.

This study aimed to improve the level of competence in Life Science of Grade 11 learners with special needs through PALP, it particularly aimed to answer the following questions:

1. What is the level of competence of the LSENs on the selected topic of Life Science before and after the implementation of the intervention?
2. Is there a significant difference between the pre-assessment and post-assessment scores of the learners before and after immersing the participants in the intervention?
3. What are the challenges in the duration of the implementation of the intervention encountered by the:
 - 3.1 learners; and
 - 3.2 home learning facilitators?

Methods

The study used a sequential mixed methods action research design. These two sequential strands of data are used to elaborate, explain, or confirm initial quantitative results to understand better better-emerging trends and relationships in the data (Teddle & Tashakkori, 2009). The quantitative strand of the study employed a one-group pre-post assessment to determine the learner's level of competence and attitudes towards Life Science before and after the intervention. Six LSN enrolled in school formed the sole set of participants assessed on a dependent variable of interest, exposed to an intervention, and then assessed again to determine the change or difference between pre-and post-intervention assessments. The qualitative strand of the study utilizes focus group discussions to explore the participants' experiences, problems, and issues encountered during the study.

Participants

The participants in this study were students with special needs who were enrolled in school during the pandemic. The researchers identified individuals with special needs who have a long-term impairment that may impede their full mobility and adaptability toward maximizing their capacity. The researcher took the following parameters into account: (1) must be a person with a disability; (2) must be a Grade 11 student enrolled in one of the public senior high schools of the Schools Division of the City of Batac and enrolled in a General Academic Strand for the 2020-2021 school year. Six (6) learners were selected for this study after considering each criterion.

Moreover, before the intervention proceeded, the researcher issued informed consent to the participants' parents, signifying their approval of their child's involvement in the study. The informed consent discussed the study procedure, potential risks and benefits, agreement on the withdrawal from participation, and the privacy and confidentiality of the learners' information.

Intervention

The Parent-Assisted Learning Plan (PALP) is a system developed by teachers to help parents teach their children basic skills at home (Niedermeyer, 1969). The PALP was implemented by inviting home learning facilitators to a 90-minute focus group discussion. The teachers who developed the modules also conducted sessions for the home learning facilitators. The focus group discussion covered a brief explanation of the home learning intervention.

It is a 3-week home instruction cycle for the participants. Among the most essential learning competencies (MELCs) covered by the researchers were Animal reproduction (S11/12LT-IIej-15), genetic engineering (S11/12LT-IIej-17 & S11/12LT-IIej-19), animal survival (S11/12LT-IIIaj-21 & 22), and evolution (S11/12LT-IVfg-26 & 27). The researchers implemented the interventions for two sessions. The first session gave home learning facilitators the first set of Life Science modules. The home learning facilitators assisted their children in accomplishing the modules based on PALP instruction from Monday to

Friday. The following week, home learning facilitators received new modules. Again, the LSENs work on their modules with the home learning facilitators' assistance. The teacher gave practice exercises that correlated with the first two-week modules to assess their understanding. A home learning facilitator was given feedback every Saturday. Because interventions are modular, home learning facilitators get weekly updates on their children's academic progress. This feedback was designed to be a systematic reinforcer for the participating home learning facilitators and included test information and teacher comments. The second session followed the same procedure.

Instrumentation and Data Collection

The researcher crafted a teacher-made pre-and-post assessment to ascertain the Grade 11 LSN's level of competence in selected Life Science topics. The test consisted of 50 items covering the selected Life Science MELCs. Researchers used the Table of Specifications (TOS) to ensure test validity, which was then validated by experts in science education, including the Education Program Supervisor in Science, an Education Program Specialist II, and a Master Teacher.

The procedure is based on Ally and Brijllal's (2018) study, which determined that items should demonstrate appropriateness, correctness, and usefulness for the intended purpose. Additionally, each question had to be viewed, answered, and analysed based on the following criteria: language clarity, the question's relevance, terminology, and notation.

Finally, the researchers used a semi-structured interview guide to elicit participants' viewpoints on the study's implementation of interventions and the study's issues and concerns.

Data Analysis

To answer the specific questions presented in this study, the researchers treated the gath-

ered pre-and-post assessment scores using frequency and percentages. After that, these scores were given corresponding descriptive interpretation indicated below.

Descriptive Interpretations	Score Interval
Outstanding	41-50
Very Satisfactory	31-40
Satisfactory	21 - 30
Fairly Satisfactory	11 - 20
Did Not Meet Expectations	0 - 10

The t-test: Paired Two Sample for Means is used to test the significant difference between the pre-and-post assessment scores of the participants.

Lastly, the transcriptions of focus group discussions were subjected to thematic coding analysis. The identification of codes was carried out in the same manner as the data-driven codes (Fumoto, 2016). These codes were formed due to the focus group discussions in which participants evaluated their experiences during the intervention's implementation.

Results and Discussion

Level of Competence of Grade 11 LSN on the selected topic of Life Science before and after the implementation of the intervention

In this time of the pandemic, it is difficult for Senior High School teachers to provide a meaningful learning experience in Life Sciences. In this context, the teaching of Life Sciences concepts should complement the unique educational needs of all learners, particularly those with special needs.

The first phase of the study dealt with how PALP improves the competence of the LSN in learning Life Science. Table 1 shows the result of the participants' pre- and post-assessment about their level of competence on the selected topic of Life Science.

Table 1. Participants' results of the pre and post-assessment concerning their performance in Life Science (n=6)

Range of Scores	Descriptive Interpretations	Pre-Assessment		Post- Assessment	
		f	%	f	%
41-50	Outstanding	0	0	0	0
31-40	Very Satisfactory	0	0	0	0
21-30	Satisfactory	1	17	3	50
11-20	Fairly Satisfactory	4	67	3	50
0-10	Did Not Meet Expectations	1	17	0	0
	Mean	14.33		29.50	
	SD	4.84		3.62	
	DI	Fairly Satisfactory		Satisfactory	

As revealed in the pre-assessment, the participants' level of competence in Life Science is fairly satisfactory, with a mean score of 14.33 (SD=4.84). It can be gleaned from the table that 66.67% of the participants obtained a range of scores of 11-20 with a descriptive interpretation of fairly satisfactory. This means that the participants are struggling to learn the concepts of Life Science before introducing the intervention.

It is interesting to note that the result of the post-assessment revealed a satisfactory level of competence among the participants, with a mean score of 29.5 (SD= 3.62). Likewise, the results showed that an equal number of 50% of the participants obtained a range score of 21-30 (satisfactory) and 11-20 (fairly satisfactory). Thus, the findings indicate that the intervention immensely helped learners with special needs in moving from a fairly satisfactory to a satisfactory level of competence in learning the selected topics of Life Sciences. These findings support the researchers' and school principal's observations during home visits to monitor the intervention's implementation. Accordingly, they have noted that PALP has strengthened the bond between school and home learning facilitators. Teachers worked closely with the HLF to ensure that LSEs had the support they needed to continue their education and gain the knowledge they needed. So, teachers made sure parents knew how to help their children with this year's modular set-up.

Their responses affirm Martinez's (2015) study, which found that parents, siblings, and other significant relatives can foster rich learning environments for children's academic

development. Additionally, Sapungan and Sapungan (2014) emphasized that when teachers involve parents in their children's education, it demonstrates that the school is proactive in implementing changes or growth among the students.

Comparative Analysis between the Pre-and-post assessment scores of the learners before and after immersing the participants in the intervention

Table 2 shows the T-test results comparing the participants' pre-assessment and post-assessment mean scores. Data revealed that the post-assessment mean score of 29.50 (SD=3.62) is significantly higher than the pre-assessment mean score of 14.33 (SD=4.84). This indicates that the mean scores are significantly different, as clearly shown by the obtained differences with the t-value 6.76, which is significant at the 0.05 probability level. This implies that the participants' level of competence in Life Science was improved after implementing PALP in the teaching and learning process. This finding suggests that PALP effectively assists home learning facilitators in helping their children adapt to a new mode of instruction and increasing their children's level of competence in learning the selected Life Science topics. According to Antoine (2015), parents who are more involved in their children's academic lives have students who have a higher probability of academic success. Similarly, Partin (2017) emphasized that increased parental involvement allows for increased teacher-parent communication. This improved communication would enable the parent to

stay informed of the student's needs, the teacher's goals and expectations, and the student's academic progress. As a result, a teacher and

parent can work together to ensure that the student meets expectations and receives needed remediation.

Table 2. Paired Sample for t-test results for the Pre-and-Post Assessment Mean Scores of Participants

	n	Mean	SD	t-value	df	p	Interpretation
Pre-Assessment	6	14.33	4.84	6.76**	5	0.001	Significant
Post-Assessment	6	29.50	3.62				

** p<0.01, two-tailed test

Problems encountered by the Learners with Special Needs

The complexity of the Lessons

Despite the assistance provided by their home learning facilitators, the learners with disabilities struggled to comprehend the complexities of the lessons. Because these students are part of the mainstream, they receive the same modules as regular students in the real world. However, as noted, the difficulty of the activities and the complexity of the concepts in Life Science are incompatible with the learners' capacity to process and perform the activities.

The findings are supported by the feedbacks of the learners with special needs and home learning facilitators in the implementation of PALP. Here are some of their responses: "*Haan unay agkasta diay knowledgena ta diay panunotna ket kasla ubbing [elementary level] isu a marigatan a mangawat no maminsan*" (His understanding does not work well because his mental age is that of a child [in the elementary level] that is why he has a hard time comprehending sometimes.)" -Home Learning Facilitator F

"*Adda dagitay madina maawatan a word no daduma aglalo dagitay higher concepts isu nga agpasuro kaniami*" (Sometimes, there are words which he can't understand, especially those which have higher concepts, so he asks for our help.)" -Participant B [translated by the Sign Language Expert]

The findings presented above regarding the difficulties encountered by learners with special needs could be attributed to various factors, including the readiness of teachers to meet their needs in the face of the pandemic. According to Cole (2017), teachers who do not

receive adequate training in the education of students with disabilities find it challenging to meet the goals and needs of their students daily. If they are not directly affected by the students' disabilities, most people have little understanding of their plight. A lack of knowledge has emerged as the most significant barrier for students with disabilities because of this development. On the other hand, educational institutions are figuring out how to overcome these difficulties and promote equality in education.

While it is true that the teachers have established a support system that empowers parents in assisting their children at home, the teachers were unable to fully comprehend the characteristics and needs of the participants, which was not translated in the modules that were provided to them.

Problems encountered by the Home Learning Facilitators

Retention

The facilitators of home learning revealed that they forgot some of the information given to them following the PALP session during the first session. They acknowledged that their age and other responsibilities impair their ability to recall the lessons cascaded during the sessions. This means that if home learning facilitators overlook the provided instructions and procedures for explaining the lesson to their children, it will affect their ability to comprehend the task.

The findings are supported by the remarks of the home learning facilitators. Here are some of their responses:

"A little bit, I forgot some of those ma'am and sir's explanations." -Home Learning Facilitator D.

"Marigatanak met no maminsan sir aglalo ta lolaak pay, sa adda pay kakabsatna a dua ken cousins, bale inemda nga isursurok, isu a no maminsan, mailipatak dagitay sessions (Sometimes I have a hard time teaching, sir, especially that I am now old, and he (referring to the learner) has two siblings and one cousins. I teach a total of six students, that's why I sometimes forget about the [instructions in the] sessions.)" -Home Learning Facilitator F

No Formal Training for Sign Language.

Due to their limited knowledge of sign language, the facilitators of home learning have difficulty explaining Life Science concepts to the learner with special needs. One of the home learning facilitators revealed that she writes the messages she wishes to convey rather than communicating via sign language to ensure they understand each other. This implies that their lack of sign language training impedes their ability to communicate effectively during the lesson, thereby affecting the transfer of knowledge to the learner.

The findings are supported by the remarks of the home learning facilitators. Here are some of their responses:

"Haanko unay kabisado, sir, iti agsign language, isu nga isursuratko iti papel nukua diay ibagak sir." (Since I do not have a full grasp of the sign language, I write what I want to say on a piece of paper.)" -Home Learning Facilitator B

"Adda trainingna idi elementary iti sign language, isu nga as the mother, nasursurok met bassit dagitay basic ngem adda dagitay malipatak nukua isu nga isuratko nukua tapnu agkinaawatankami." (She was trained in sign language back in elementary that's why as a mother, I also know quite a bit about the basics. However, sometimes I forget about some things that's why I resort to writing it down in order for us to understand one another.)" -Home Learning Facilitator E

This is consistent with the researchers' observations during home visits, which revealed that home learning facilitators face difficulties explaining concepts due to their lack of formal sign language training. They have noted how compelling the supplemental videos are in

assisting them in explaining the complex lessons. This means that the limited training in sign language made it more difficult for facilitators of home learning to transmit their knowledge to learners. They noted, however, that despite this obstacle, home learning facilitators are committed to assisting their children in receiving a quality education.

The researchers' remarks support the findings. The following are a few of their responses: "During our first home visit, I observed that the Home learning facilitator is challenged by the fact that she cannot explain the lesson well with her limited knowledge of sign language. She uses paper and pencil to write what she wants to express to understand the lesson. We tried to give supplemental videos to help our HLF cascade the Life Sciences lessons with this situation. As I observed during the second visit, they were more engaged since they were able to see the process as discussed in their modules." - Researcher A

"One of the participants in this study is deaf and mute. It was known during the home visit that the HLF who assists the said participant has no formal training for sign language. Therefore, it was a struggle for her to convey the lesson. Video lessons were then given as a supplement. During the subsequent home visits, a big change became noticeable. The learners became more participative." - Researcher B

The preceding findings regarding the difficulties home learning facilitators encounter support Garbe, Ogurlu, Logan, and Cook's (2020) assertion that despite efforts to assist parents in the difficult task of home education, struggles are unavoidable. Similarly, Lee, Ward, and Chang (2020) reported that during the acute phase of the COVID-19 crisis, half of the American parents surveyed reported feeling overwhelmed by the responsibilities of home education in which they are struggling for balancing responsibilities while assisting multiple children in the home with learning, resulting in significant depression and moderate or severe anxiety. Dong, Cao, and Li (2020) also discovered that Chinese parents view and experience online learning implementation as challenging during the COVID-19 crisis, mainly because

some are neither trained nor prepared to adopt online learning.

All in all, despite the difficulties encountered while putting this support system in place, the home learning facilitators continued to receive PALP as a support system, which resulted in a positive outcome in improving the Life Science competence of the learners with special needs. In general, it was essential for the participants to be surrounded by people who, despite the obstacles, were willing to support them and serve as sources of motivation. It was always assumed that learners with special needs were diverse individuals with a diverse range of needs. The participants were able to complete tasks that appeared to be impossible for them due to the assistance of the home learning facilitators. On a positive note, the participants and home learning facilitators expressed relief at not being alone in the face of the challenges of everyday life, and they emphasized the importance of having a support system such as PALP to serve as an inspiration to strive to continue living their dreams.

Conclusion

Based on the findings, the following conclusions were arrived at:

1. There was a significant improvement in the level of competence of the learners with special needs in the selected topics in Life Science. This means that Parent-Assisted Learning Plan effectively assists home learning facilitators in helping their children adapt to a new mode of instruction and increasing their children's level of competence in learning the selected Life Science topics;
2. There are some concerns regarding the implementation of the Parent-Assisted Learning Plan encountered by the participants and the home learning facilitators. These include the complexity of the lessons, retention, and no formal training in sign language; and
3. This conforms to the Zone of Proximal Development (ZPD) by Vygotsky (1978) that the presence of home learning facilitators assisting learners allows them to accomplish specific tasks they would otherwise not be able to accomplish on their own.

Acknowledgement

The researchers would like to express their gratitude to all those who contributed to the completion of this study. They would like to acknowledge Dr. Joel B. Lopez, CESO V, the Schools Division Superintendent of the Schools Division of the City of Batac; the Schools Division Research Committee namely: Dr. Annie D. Pagdilao, Assistant Schools Division Superintendent; Ms. Nemalyn M. Ulep, Chief Education Supervisor-SGOD; Dr. Marilou B. Sales, Chief Education Supervisor-CID, Engr. Pepsi P. Duldulao, Senior Education Program Specialist; and the Education Program Supervisors: Dr. Aubrhey Marie R. Oasay, Dr. Jhon Rey D. Ortal, Dr. Eldefonso B. Natividad, Dr. Noreen C. Taguinod – for their technical expertise, steadfast encouragements, insightful comments, suggestions, valuable discussions that made this research work significant. The researchers' respective institution, Ferdinand E. Marcos Senior High School, under the leadership of Ms. Carmencita P. Lorenzo, to the faculty and staff who serve as an inspiration that a research journey is a voyage to convey knowledge to others. Their family and friends, for the motivation, unconditional love, and unflinching support.

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