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Utilization of Interactive E-Learning Instructional Supplemental Material in TLE Cookery Exploratory Course

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ABSTRACT

Embracing technology is quite beneficial in schools. Research in e-learning, from its implementation, has been the subject of several reviews addressing issues related to technology, design, and use. The purpose of this study is to utilize and evaluate the developed interactive e-learning supplemental instructional material in the TLE Cookery Exploratory Course through Google Sites. Specifically, an evaluation of the utilized instructional material in terms of its content qualities, instructional qualities, technical qualities, and other findings (i.e., conceptual errors, factual errors, and grammatical errors) was administered. Developmental research design as the systematic study of designing, developing, and evaluating instructional technology that meet the criteria of consistency and effectiveness was utilized. Purposive sampling was utilized for selecting teacher-respondents and cluster-sampling for student respondents. The study revealed that the e-learning interactive supplemental material in Cookery Exploratory aids the student in improving their acquisition of learning. The result of the study, therefore, concludes that the designed learning resource can attain a specific learning outcome and enhance cognitive outcomes by engaging students in interactive learning materials.

Keywords: *Cookery Exploratory Course, E-learning, Interactive learning, Supplemental Instructional Material*

INTRODUCTION

The common key characteristic among different teaching materials is the ability to accentuate learning, regardless of its form and size. The significance of teaching-learning materials is to make lessons more interesting and to aid teachers in simplifying the expression of concepts. According to Harsono (2015), the existence of teaching-learning materials is an indispensable element for being able to conduct teaching-learning activities. These materials, ranging from traditional textbooks to modern computer-generated resources, have been consistently shown to have a positive impact on student outcomes (Talbert & Mor-Avi, 2019; Munyakazi et al., 2022).

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Department of Education (DepEd) Order No. 21, s. 2019, or the Policy Guidelines on the K to 12 Basic Education Program, has promulgated the use of different flexible learning styles and materials. The learning resources should be student-oriented to cater to the diverse needs of the learners. The development of teaching-learning materials is regarded as one of the major factors that promote student learning, taking into account that it helps in the achievement of academic goals and objectives (Kapur, 2019).

The researcher believes that the learning resources should be on par with emerging technologies. Such technologies must be utilized for the development of different learning materials. Visual representations, audio-visual materials, and auditory materials are all around students on a daily basis, according to the study by Buslieta (2013). This is particularly true for media such as television and the internet. It is quite difficult to imagine today's educational process without the use of various teaching and learning resources. In addition, the study by Bonk et al. (2016) stated that learning is becoming more self-directed and informal with the support of emerging technologies. A wide variety of online resources have promoted informal learning by allowing people to access information upon demand and only as needed. Differentiated instruction is a pedagogical-didactical approach that provides teachers with a starting point for addressing students' diverse learning needs (Smale-Jacobse et al., 2019). In general, aside from supporting learning, the current available technologies can assist teachers in the creation of different forms of instruction in the teaching-learning process. The modification of learning materials such as worksheets, videos, group activity instructions, and the like allowed the teachers to attend to the individual needs of each learning style. With this, educators should embrace diversity and adjust their instruction in line with the diverse learning needs of students in their classrooms (Schleicher, 2016). Moreover, instructional materials extends beyond traditional classrooms, with educational institutions increasingly incorporating digital resources like teacher-created videos and instructional digital games to support learning (Nabayra, 2022). These innovative approaches not only motivate students but also cater to diverse learning styles, leading to improved academic achievement.

The Department of Education launched Order No. 12, S. 2020, or the Basic Education Learning Continuity Plan (BE-LCP) with the goal of delivering quality basic education amidst the public health emergency. Oliveira et al. (2021) examined the sudden shift to remote education during the COVID-19 pandemic, stressing the importance of understanding the educational process, tools utilized, and personal adjustments made by both students and teachers. Hence, adapting of distance e-learning interactive materials quickly emerged to cope with the challenges in education. According to the study of Sufyan et al. (2020), using the e-learning model is beneficial due to its flexibility to access learning resources and the opportunity to promote independent learning.

Recent restrictions brought about by the COVID-19 pandemic have created an era known to us as “The New Normal”. This shift has compelled teachers to transition to full-time online teaching, moving away from traditional face-to-face methods (Al-Bargi, 2021). The transition to online education has become increasingly common, with continuous changes in teaching and

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learning methods (Dumitrescu, 2023). Teachers integrating technology into their classrooms aim to create a learner-centered environment that enhances student engagement (Gcabashe & Ndlovu, 2022). It is common knowledge that such restrictions have greatly affected the teaching-learning process, such that enrollees' ways of engaging themselves to learn have become quite challenging. This challenge undeniably accelerated the need for an online platform where teachers can carry out classes for learners whenever face-to-face classes are not allowed, provided that the learners have access to the internet. Despite these challenges, the pandemic has also provided opportunities for educators to explore new teaching tools, conduct research, and improve their teaching practices (Chew et al., 2023).

Aldiab et al. (2019) highlighted the significant worldwide shift towards the use of Learning Management Systems (LMSs) in academic institutions. These systems are integrated into the educational management system to enhance the overall teaching and learning process. In response thereto, DepEd submitted a circular aide-memoire dated July 01, 2020, and introduced its game-changer: a modernized instructional material through the release of the LMS or Learning Management System. LMS is an e-learning platform where the teacher can utilize different interactive learning materials online. LMS is a fundamental tool in modern education, enabling the delivery, tracking, and management of training and educational content (Guo & Lee, 2023). In addition, LMS not only benefits traditional teaching but also revolutionizes educational institutions, transforming the educational landscape (Reid, 2019).

Engagement in interactive content can likewise be a game-changer when it comes to e-learning. Interactive e-learning has garnered significant research interest, with studies emphasizing the importance of interactivity in enhancing the effectiveness and acceptance of e-learning platforms. Andersson et al. (2022) note that e-learning can accommodate different learning styles through interactive features like quizzes and cases, fostering engagement and reflective thinking that contribute to knowledge retention. This aligns with the findings of (Novia et al., 2022), who discuss the development of interactive e-modules based on mobile learning to cater to specific learner needs, emphasizing goal-oriented and focused learning experiences. Additionally, Nisa and Lolytasari (2022) stress the importance of various types of interactions in e-learning, including learner-content, learner-instructor, and learner-learner interactions, in achieving educational goals. In conclusion, these studies underscore the critical role of interactivity in interactive e-learning, emphasizing its positive impact on user satisfaction, engagement, knowledge retention, and overall learning experiences.

In connection with the adaptation of technology to education, DepEd released Memorandum OUA-OUT-080522-007 dated August 5, 2022, with the subject "Conduct of Televised Virtual In-Service Training for Teachers 2022". The program aimed to impart the latest technological innovation in instruction to the teachers, preparing the latter in classes by utilizing different digital applications that support student learning. In addition, the discussion thereafter ensured the teachers' upskilling, which is essential for the effective utilization of different digital applications in their respective classes. Batane and

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Ngwako (2017) emphasized that providing teachers with digital skills and knowledge is now considered an essential component of any teacher-training program in order to enable new teachers to satisfy the educational requirements of the twenty-first century.

In relation to what the integration of current technology has to offer in the field of education, the researcher developed interactive e-learning supplemental instructional material that is expected to support the student's learning needs. One of the best features of the interactive e-learning supplemental material is its accessibility. The learners can access the lesson even if they are not in the formal, four-walled classroom, thus making learning possible in various locations such as an airplane, train, or boat. In addition, the Internet has enabled the emergence of a global world where knowledge and information move at a fleeting pace, and flexibility and innovation are essential demands of the learning process (Pedro et al, 2011). The interactive e-learning instructional supplemental material facilitates dynamic learning activities considering that the researcher utilized Google Sites, a free website builder from Google, while incorporating the different applications such as (i)YouTube for educational video content, (ii) Canva for graphical learning content, (iii) Google Forms for different forms, surveys, and quizzes, and (iv) LUMI for interactive content.

Finally, different applications introduced by the Virtual In-Service training were utilized. These applications aim to develop e-learning instructional material to supplement the currently available learning materials by providing students with a space wherein they will feel inclusivity in their pursuit of knowledge. Embracing technology is quite beneficial in schools. As time goes on, the use of technology will continue to increase, making learning more and more interactive.

The main purpose of this research was to utilize an interactive e-learning instructional material in the TLE Cookery Exploratory course. It sought to find answers to the following questions:

1. What is the demographic profile of teacher-respondents in terms of:
   1.1 age;
   1.2 sex;
   1.3 number of years in teaching; and
   1.4 teaching position?
2. What is the demographic profile of the student-respondents in terms of:
   2.1 age;
   2.2 sex; and
   2.3 grade level?
3. Using the DepEd Prescribed Evaluation Form for Non-Print Materials, what is the assessment of teacher and student respondents on the utilized interactive e-learning instructional supplemental material in terms of:
   3.1 Content Quality;
   3.2 Instructional Quality;
   3.3 Technical Quality; and
   3.4 Other Findings (i.e., conceptual errors, factual errors, and grammatical errors)?
4. What are the scores of the student respondents before and after the utilization of the interactive e-learning supplemental material?
5. Is there a significant difference between the pre-test and post-test scores of the student-respondents?

METHODOLOGY

The study utilized a developmental method of research by incorporating the Instructional System Design (ISD). It is a systematic approach that involves the use of media for instructional purposes and systematic

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instructional design procedures (Reiser, 2001). ISD models typically encompass stages such as analysis, design, development, evaluation, and management, based on instructional and learning theories, aiming to enhance the quality of teaching (Göksu et al., 2017). These models are designed to reflect contemporary environments and limitations (Moore, 2016).

Research Design

ADDIE model, which stands for Analyze, Design, Develop, Implement, and Evaluate, was utilized. It is a well-known instructional design approach widely used in various fields such as education, healthcare, and technology (Lee, 2024). This model provides a systematic process for developing effective learning experiences and instructional systems (Hasan & Ahmad, 2018). Additionally, Pribadi & Chung (2023) stress the significance of following a systematic instructional system design model involving analysis, design, development, implementation, and evaluation to ensure high-quality online learning programs. Thus, to meet the requirements of consistency and efficacy in instructional material, which serves as an empirical basis for interactive e-learning supplementary material.

Population and Sampling Technique

Purposive sampling for selecting teacher respondents and cluster sampling was used in selecting student respondents. For the purposive sampling method, this involves deliberately choosing participants based on specific criteria set by the researcher to ensure that the sample aligns closely with the aims and objectives of the research, thereby enhancing the study's rigor and the trustworthiness of the data and results (Campbell et al., 2020). Selection of participants was carefully conducted. This process involved careful consideration of with the particular characteristics or experiences that are essential for addressing the research questions effectively and evaluating the interactive e-learning material in Cookery Exploratory. Particularly, they are the experts, Head Teacher, Master Teachers, and experienced teachers from Junior High School Technology and Livelihood Education Department of Dasmariñas Integrated High School who are sufficiently experienced in developing instructional materials. The purpose of this data collection technique was to gather valid information needed for the acceptability of the developed interactive e-learning supplemental material.

For the cluster sampling method, the researcher divided the population of students by selecting one section consisting of 43 enrolled Grade 7 student participants of Dasmariñas Integrated High School.

Data Gathering

Research inputs were considered, and they are (i) teachers' and students' demographic profile, and (ii) Pre-assessment of the e-learning interactive supplemental material. The pre-assessment was the evaluation of the research panels and selected expert teachers of the research tools (i.e. Survey Questionnaire, Daily Lesson Log, Table of Specifications, Pre-Post test questionnaire, and the content of interactive e-learning material).

During the analyzing phase, the adaptation of technology in education was considered. Considering that the researcher handles the TLE Cookery Exploratory course, the integration of technology in the said subject matter was thought of; hence, the development and utilization of the interactive e-learning supplemental

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material.

During the designing stage, the lesson plan in the DepEd prescribed K-12 Cookery Exploratory curriculum guide and learning module was considered. Integration of audio-visual elements, i.e. sound effects, illustrations and pictures, short videos, and the interactive elements. The following software applications were considered: (i) Google Sites for web page designing and building, (ii) Youtube for educational video content, (iii) Canva for illustrations and short video as well as sound effects, (iv) Google Forms for assessments, and other applications in the Google Workspace for streamline instruction and assessment, and (v) Lumi Education for creating and embedding interactive learning content.

During the developing stage, the pre-assessment of the research panels and selected expert teachers of the research instruments was taken into consideration. (i.e. Survey Questionnaire, Daily Lesson Log, Table of Specifications, Pre-Posttest questionnaire, and the content of interactive e-learning material). The aforementioned elements and applications considered during the designing phase were utilized. The Google Sites were used to manage the content of the lesson on TLE Cookery Exploratory course while integrating the audio-visual elements of the different applications. Google Sites offer a versatile platform that can be effectively utilized in educational settings to enhance learning experiences. The benefits of incorporating Google Sites in learning environments are multifaceted. This versatility allows for a dynamic and interactive learning environment. Additionally, Google Sites, as part of Google Workspace for Education, provides a range of applications that can be integrated into the learning process, such as Google Docs, Slides, Sheets, Forms, and Drive, fostering collaborative work and enhancing student engagement (Moreno-Guerrero et al., 2020). Moreover, the use of Google Sites in education has been shown to make learning more interesting and enjoyable for students. It enables the provision of downloadable learning materials, offers a platform for students to upload and access assignments, and ensures that course materials remain accessible for review throughout the learning process (Permatasari et al., 2022). Furthermore, Google Sites can be leveraged to deliver instruction effectively in various subjects, including physical education, by providing a safe virtual learning environment, ensuring accessibility to learning materials, and allowing students to learn at their own pace (Culajara, 2022).

Additionally, during the development stage, the DepEd Guidelines and Processes for Learning Resources Management Development System Assessment and Evaluation for non-print learning material were utilized as basis for developing the interactive learning material. The LRMDS guidelines served as the basis for the evaluation of the content quality, instructional quality, technical quality, and other findings (i.e., conceptual errors, factual errors, and grammatical errors) of the aforementioned interactive learning material.

During the implementation phase, the Cookery exploratory course throughout the quarter was delivered, using the developed interactive e-learning instructional supplemental material.

For the evaluation period, a pre-test consisting of forty (40) multiple-choice items covering the TLE Cookery Exploratory course was conducted. Subsequently, the interactive e-learning supplemental

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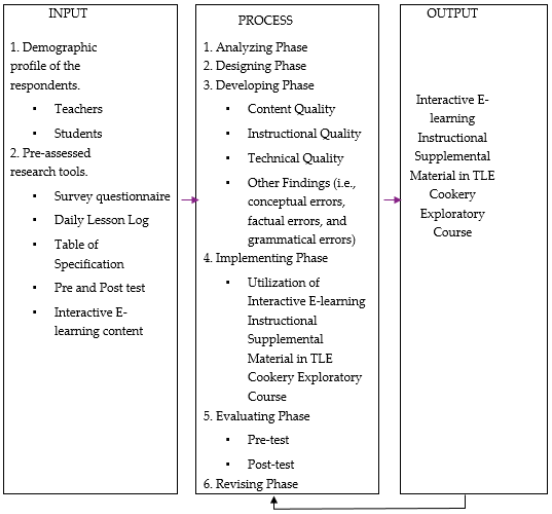
material in the TLE Cookery exploratory course for the selected Grade 7 students was employed. Following this, a post-test was administered. By utilizing pre-tests and post-tests, the effectiveness of the implemented instructional material could be measured. Studies have shown that differences between pre-test and post-test scores highlight the efficacy of educational programs and the importance of maintaining consistency in teaching practices and experiences (Rezaee et al., 2014). Additionally, pre-tests can help "prime" students by highlighting areas they need to focus on during the educational intervention, leading to improved post-test performance (Nalliah & Allareddy, 2014).

Figure 1. Procedure of the development and assessment of the interactive learning material.



Furthermore, the interactive e-learning instructional supplemental material in TLE Cookery Exploratory course was tried by the teacher and student evaluators. After the teacher and student evaluators had gonewent over and tested the said e-learning instructional supplemental material, the teacher and student respondents answered the survey form in line with the DepEd Prescribed Evaluation Form for Non-Print Materials. The answers to the survey form were the bases for the evaluation as to the content quality, instructional quality, technical quality, and other findings (i.e., conceptual errors, factual errors, and grammatical errors). The survey results were taken into consideration and its suggestions were integrated for the improvement of Interactive E-learning instructional supplemental material in TLE Cookery exploratory course.

Following the evaluation phase, the revising step was given careful consideration. The outcomes of the pre-test and post-test will serve as the foundation for enhancing the content of the interactive learning material.

Data Analysis.

The following were used for the treatment of data in this study: (i) frequency, (ii) mean, (iii) ranking, and (iv) paired samples t-test.

Frequency was used to describe the profile of the teacher and student respondents (i.e. age, sex, and number of years in teaching).

Mean was used to describe the assessment of the teacher respondents on the developed instructional materials.

Ranking was done to orderly arrange from the top to bottom the result of survey evaluation questionnaire in terms of (i) content quality, (ii) instructional quality, (iii) technical quality, and (iv) other findings (i.e., conceptual errors, factual errors, and grammatical errors).

Paired Sample T-test was used to compare the means of two variables which are the pre-test and post-test result scores gained by the single group of student participants.

Ethical Considerations.

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The following were taken into consideration: selection of respondents, their participation, the procedures and protocol of the study, a detailed description of the process, the duration of the study, and any potential risks to both respondents and researcher. Additionally, the benefits that the respondents or community might receive, the confidentiality of the information, the sharing of the results, and the respondents has the right to refuse in participation were considered.

RESULTS AND DISCUSSIONS

1. Data distribution of the Teacher-respondents' Demographic Profile

The demographic information below provides data that is necessary in determining if the individual in the study is a representative of the target population. This is to describe the teacher-respondent characteristics, such as age, sex, years of teaching, and years in service.

Table 1.1 Teacher-respondents' Demographic Profile in terms of Age

Age	Frequency	Percentage
25 years and below	2	9.1
26 years to 35 years	7	31.8
36 years to 45 years	8	36.4
46 years to 55 years	1	4.5
56 years and above	4	18.2
Total	22	100.0

Table 1.1 indicates that individuals aged 36 to 45 years old, with a frequency of 8 representing 36.4 percent, belong to the most common age group among the teacher respondents. On the other hand, the lowest number of teacher-respondents with a frequency of 1, representing 4.5 percent, belongs to the age group of 46 to 55 years old.

Table 1.2 Teacher-respondents' Demographic Profile in terms of Sex

Sex	Frequency	Percentage
Male	1	4.5
Female	21	95.5
Total	22	100.0

Table 1.2 shows that females belong to the most common sex group among the teacher-respondents, with a frequency of 21 representing 95.5 percent. The male teacher-respondent had the lowest number, with a frequency of 1, representing 4.5 percent.

Table 1.3 Teacher-respondents' Demographic Profile in terms of Number in Years in Teaching

Years in Teaching	Frequency	Percentage
10 years and below	10	45.5
11 years to 20 years	8	36.4
21 years to 30 years	2	9.1
30 years and above	2	9.1
Total	22	100.0

Table 1.3 indicates that individuals with 10 years and below, in teaching experience are 10, representing 45.4 percent, are the most common group among teacher respondents. On the other hand, individuals 21 to 30 years and older represent the lowest number of teacher respondents, with a frequency of 2 or 9.1 percent.

Table 1.4 Teacher-respondents' Demographic Profile in terms of Teaching Position

Teaching Position	Frequency	Percentage
Teacher 1	3	13.6
Teacher 2	6	27.3

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	Teacher 3	11	50.0
	Master Teacher 1	2	9.1
	Total	22	100.0

Table 1.4, in terms of teaching positions, it indicates that those in the Teacher III positions are the most common group of respondents, with a frequency of 11, representing 50.0 percent. On the other hand, Master Teacher I got the lowest number of teachers respondents, with a frequency of 2, representing 9.1 percent.

2. Data Distribution of the Student-respondents' Demographic Profile

The demographic information below provides data that is necessary in determining if the individual in the study is a representative of the target population. This is to describe the student-respondent characteristics, such as age, and sex.

Table 2.1 Student-respondents' Demographic Profile in terms of Age.

	Age	Frequency	Percentage
	12 years old	25	58.1
	13 years old	18	41.9
	Total	43	100.0

Table 2.1 indicates that Grade Seven individuals aged 12 years old, with a frequency of 25 representing 58.1 percent, belong to the most common age group among the student respondents. On the other hand, Grade 7 individuals aged 13 had the lowest number of students responding, with a frequency of 18, representing 41.9 percent.

Table 2.2 Student-respondents Demographic Profile in terms of Sex

		Frequency	Percentage
	Male	20	46.5
	Female	23	53.5
	Total	43	100.0

Table 2.2 shows that there are more females among the student-respondents, with a frequency of 23 representing 53.5 percent. The male student-respondents are lesser in number, with a frequency of 20, representing 46.5 percent.

3. The Assessment of Teacher and Student-respondents on the Utilized Interactive E-learning Instructional Supplemental Material

The teacher and student respondents assessed the instructional material in terms of 3.1 Content Quality, 3.2 Instructional Quality, 3.3 Technical Quality, and 3.4 Other Findings (i.e., conceptual errors, factual errors, and grammatical errors).

Table 3.1 below displays the assessment of the teachers and students on the utilized interactive e-learning instructional supplemental material. Based on the teachers' responses, the indicators "The content is relevant to real-life situation" and "The content is consistent with topics/skills found in the DepEd Learning Competencies for the subject and grade/year level it was intended" received the highest mean score of 3.91 (very satisfactory) with a standard deviation of 0.294. Therefore, the e-learning interactive supplemental material was able to achieve its expected content objectives that are aligned with the DepEd K–12 curriculum for the Cookery Exploratory Course. It is also observed that the learning material information is relevant for seventh-grade level in a real-life situation. On the other hand, the indicator "The content is accurate" received the lowest mean score of 3.32 (satisfactory) with a standard deviation of .477. Therefore, the result

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will serve as a basis for re-evaluation and revision of the cookery exploratory e-learning instructional material in terms of its content accuracy.

The students' responses for the content quality indicators "Concepts developed contribute to enrichment, reinforcement, or mastery of the identified learning objectives" and "The content is relevant to real-life situations" gained the highest mean score of 3.88 (very satisfactory) with a standard deviation of .324. Hence, the interactive e-learning material achieved its purpose of providing enrichment for the learners in the cookery exploration. It was also observed that the seventh-grade student-participants sought that the learning material information was relevant in a real-life situation. On the other hand, the indicator "The content is accurate" received the lowest mean score of 3.47 (satisfactory) with a standard deviation of .505. The utilization of interactive digital teaching materials has been shown to enhance student understanding by visualizing content clearly through images, videos, and animations, thereby increasing student interaction and interest (Maladerita et al., 2023). Moreover, the integration of interactive learning media in classrooms has been highlighted as essential for achieving desired learning outcomes (Mahardika et al., 2023). However, Giyanto et al. (2020) stressed that teaching materials that prioritize characteristics such as content accuracy and regular updates play a key role in fostering students' creativity and enhancing their grasp of concepts. Continuous evaluation and refinement of digital learning resources are crucial to ensure their relevance and impact on learning outcomes (Song & Tombs, 2022). Hence, the result will serve as a basis for evaluating and revising the content of the cookery exploratory e-learning instructional material.

Overall, the content quality based on the teacher responses gained a mean score of 3.73 (very satisfactory). Further, based on the student responses, the overall content quality of the instructional material received a mean score of 3.72 (very satisfactory). Hence, the interactive e-learning material has met the standard quality in accordance with DepEd's Learning Resources Management and Development System guidelines and evaluations.

Table 3.2 below displays the assessment of the teachers and students who participated on the instructional quality of the interactive e-learning supplemental instructional material. Instructional quality pertains to the effectiveness of teaching methods, materials, and strategies employed in educational settings. Based on the teachers and students' responses, the indicator "Purpose of the material is well defined" received the highest mean result of 3.95 (very satisfactory) with a standard deviation of.213 from the teacher respondents and 3.88 (very satisfactory) with a standard deviation of .324 from the student-respondents. Henceforth, the respondents observed that the goal of the developed learning material was clearly specified. However, it was also observed that "Level of difficulty is appropriate for the intended target user" was of the lowest rank among the other indicators. It got a mean score of 3.32 (satisfactory) with a standard deviation of 4.77 from the teacher respondents and a mean score of 3.37 (satisfactory) with a standard deviation of.489 from the student respondents.

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Table 3.1 Respondents' Assessment on the Utilized Interactive E-learning Instructional Supplemental Material in terms of Content Quality

Indicators	Teacher			Student		
	Mean	SD	VI	Mean	SD	VI
1. The content is consistent with topics/skills found in the DepEd Learning Competencies for the subject and grade/year level it was intended.	3.91	.294	VS	3.81	.394	VS
2. The concepts developed contribute to enrichment, reinforcement, or mastery of the identified learning objectives.	3.82	.395	VS	3.88	.324	VS
3. The content is accurate.	3.32	.477	S	3.47	.505	S
4. The content is up-to-date.	3.68	.477	VS	3.60	.495	VS
5. The content is logically developed and organized.	3.64	.492	VS	3.70	.465	VS
6. The content is free from cultural, gender, racial, or ethnic bias.	3.86	.351	VS	3.81	.394	VS
7. The content stimulates and promotes critical thinking.	3.73	.456	VS	3.63	.489	VS
8. The content is relevant to real-life situations.	3.91	.294	VS	3.88	.324	VS
9. The language used (including vocabulary) is appropriate to the target user level.	3.59	.503	VS	3.60	.495	VS
10. The content promotes positive value that support formative growth.	3.82	.395	VS	3.79	.412	VS
Overall	3.73	.161	VS	3.72	.174	VS

Legend: 1.0-1.49 (Unsatisfactory); 1.50-2.49 (Poor); 2.50-3.49 (Satisfactory); 3.50-4.00 (Very satisfactory)

Table 3.2 Respondents' Assessment on the Utilized Interactive E-learning Instructional Supplemental Material in terms of Instructional Quality.

Indicators	Teacher			Student		
	Mean	SD	VI	Mean	SD	VI
1. Purpose of the material is well defined	3.95	.213	VS	3.88	.324	VS
2. Materials achieves its defined purpose	3.68	.477	VS	3.81	.394	VS
3. Learning objectives are clearly stated and measurable	3.86	.351	VS	3.77	.427	VS
4. Level of difficulty is appropriate for the intended target user.	3.32	.477	S	3.37	.489	VS
5. Graphics/ color/ sounds are used for appropriate instructional reasons	3.73	.456	VS	3.77	.427	VS
6. Materials is enjoyable, stimulating, challenging, and engaging	3.77	.429	VS	3.86	.351	VS
7. Materials effectively stimulates creativity of target user	3.77	.429	VS	3.77	.480	VS
8. Feedback on target user's responses is effectively employed	3.50	.512	VS	3.53	.550	VS
9.Target user can control the rate and sequence of presentation and review	3.73	.456	VS	3.74	.441	VS
10. Instruction is integrated with target user's previous experience	3.50	.512	VS	3.51	.506	VS
Overall	3.68	.126	VS	3.70	.137	VS

Legend: 1.0-1.49 (Unsatisfactory); 1.50-2.49 (Poor); 2.50-3.49 (Satisfactory); 3.50-4.00 (Very Satisfactory)

The advantages of utilizing interactive learning material in terms of its instructional quality are such as being simple, clear, vivid, visual, convenient, flexible, and fast (Li,

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2017). According to Sriphon (2022), one significant advantage of interactive online learning is the flexibility it offers, allowing students to access materials from anywhere and at any time. This flexibility not only saves time but also reduces costs associated with traditional learning methods, such as transportation and accommodation expenses. Additionally, in the study of Zaitun et al. (2021), online learning promotes independent learning, modernizes absence of direct interaction may lead to challenges in promoting meaningful learning experiences (Davidovitch & Wadmany, 2021).

The result supports the study of Utafumi and Cahyono (2020), which found that in the context of specific subjects, analyzing the level of learning difficulties in e-learning environments has revealed the importance of aligning the difficulty of education concepts, and enhances interaction between teachers and students.

However, despite these advantages, there are also drawbacks to interactive online learning. In the study of Unger et al., (2022) one major weakness is the lack of face-to-face interaction between students and instructors, which can hinder effective communication and engagement. The
teaching materials with students' needs and capabilities. Therefore, based on the statistical result, the level of complexity of the learning material should be reviewed and re-evaluated for revision. The interactive learning material in terms of its instructional quality achieved an overall average score of 3.68, which is considered very satisfactory by the teacher respondents and 3.70 (very satisfactory) by the student respondents.

Table 3.3 Respondents' Assessment on the Utilized Interactive E-learning Instructional Supplemental Material in terms of Technical Quality

Indicators	Teacher			Student		
	Mean	SD	VI	Mean	SD	VI
1. Audio enhances understanding of the concept.	3.64	.492	VS	3.72	.454	VS
2. Speech and narration (correct pacing, intonation, and pronunciation) are clear and can be easily understood.	3.36	.492	S	3.51	.551	VS
3. There is complete synchronization of audio with the visuals, if any.	3.64	.492	VS	3.60	.495	VS
4. Music and sound effects are appropriate and effective for instructional purposes.	3.82	.395	VS	3.79	.412	VS
5. Screen displays (text) are uncluttered, easy to read, and aesthetically pleasing.	3.77	.429	VS	3.74	.441	VS
6. Visual presentations (non-text) are clear and easy to interpret.	3.91	.294	VS	3.74	.441	VS
7. Visuals sustain interest and do not distract user's attention.	3.59	.503	VS	3.58	.545	VS
8. Visuals provide accurate representation of the concept discussed.	3.68	.477	VS	3.60	.495	VS
9. The user support materials (if any) are effective.	3.55	.510	VS	3.58	.545	VS

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10. The design allows the target user to navigate freely through the material.	3.73	.456	VS	3.65	.482	VS
11. The material can easily and independently be used.	3.55	.510	VS	3.56	.502	VS
12. The material will run minimum system requirements.	3.32	.477	S	3.49	.551	S
13. The program is free from technical problems.	3.23	.429	S	3.26	.581	S
Overall	3.60	.158	VS	3.60	.181	VS

Legend: 1.0-1.49 (Unsatisfactory); 1.50-2.49 (Poor); 2.50-3.49 (Satisfactory); 3.50-4.00 (Very Satisfactory).

Table 3.3 presents the statistical findings of the teachers and students who participated in evaluating the technical quality of the interactive e-learning supplemental instructional material.

It is observed that the indicator "Visual presentations (non-text) are clear and easy to interpret" was very satisfactory, with a mean score of 3.91 and a standard deviation of.294 based on the evaluation of

(2020), which states that the integration of images and sound effects in learning materials has been shown to have significant impacts on learning outcomes. Visual and auditory elements in educational resources can enhance comprehension and engagement. Learning videos, for instance, combine sound, images, motion, and text to deliver messages more effectively.

Indicator "The program is free from technical problems" received the lowest mean score of 3.23 (satisfactory) with a standard deviation of 0.429 from the teacher respondents and 3.26 (satisfactory) with a standard deviation of 0.581 from the student-respondents, respectively. It is shown that the e-learning material faces technical difficulties since the learning material needs an internet connection, one of the problems faced by the learners is an unstable internet connection. teacher-respondents. Subsequently, the student respondents observed that the indicator "Music and sound effects are appropriate and effective for instructional purposes" got a very satisfactory rating with a mean score of 3.79 and a standard deviation of.412. The result shows that interactive material has been shown to have significance by incorporating visual presentation and other effects to enhance student learning. This result supports the study of Awrus S. et al.
Hence, the result can be utilized for another study to create another learning material that could aid the learners with fewer technical difficulties. The study of Thambirajah et al. (2022) also faced the same technical difficulties in terms of the implementation of the "online" learning approach due to internet coverage problems.

Overall, in terms of technical quality, the interactive e-learning material gained a mean score of 3.60 (very satisfactory) from the teacher and student respondents.

Table 3.4 shows that indicators of conceptual errors, factual errors, and other errors (i.e., computational errors, obsolete information, errors in the visual, etc.) gained the highest mean score of 4.00 (very satisfactory) from teacher respondents, while student respondents gave a mean score of 3.98 (very satisfactory) for the indicator's factual errors and other

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errors. Conversely, indicators of grammatical or typographical errors got the lowest mean score of 3.82 (very satisfactory) from the teacher respondents and a mean score of 3.77 (very satisfactory) from the student-respondents. It is observed by the participants that some parts of the content have minor typographical errors (i.e., "kitchen" instead of kitchen). Overall, the interactive e-learning supplemental material in terms of its other findings received a mean score of 3.95 (very satisfactory) from teacher respondents and a 3.91 (very satisfactory) from student respondents.

Table 3.4 Respondents' Assessment of the Utilized Interactive E-learning Instructional Supplemental Material in terms of Other Findings

	Teacher			Student		
	Mean	SD	VI	Mean	SD	VI
Conceptual errors	4.00	.000	VS	3.93	.258	VS
Factual errors	4.00	.000	VS	3.98	.153	VS
Grammatical and/or typographical errors	3.82	.394	VS	3.77	.427	VS
Other errors (i.e. computational errors, obsolete information, errors in the visual, etc.	4.00	.000	VS	3.98	.153	VS
Overall	3.95	.099		3.91	.121	

Legend: 1.0-1.49 (Unsatisfactory); 1.50-2.49 (Poor); 2.50-3.49 (Satisfactory); 3.50-4.00 (Very Satisfactory).

4. Results of the Student-respondents Before and After the Utilization of the Interactive E-learning Supplemental Material

As part of the treatment, the student-participants were given a pre-test and post-test to assess the efficacy of the interactive e-learning instructional supplemental material. The subsequent data presents the outcomes of the pre-test and post-test scores.

Table 4. Pre-test and Post-test Results

Before		After		Level of Proficiency
F	%	F	%	
10	23.3	-	-	Beginning (74)
7	16.3	-	-	Developing (75-79)
18	41.9	2	4.7	Approaching Proficiency (80-84)
8	18.6	7	16.3	Proficient (85-89)
-	-	34	79.1	Advanced (90-100)
43	100	43	100	

Table 4 indicates that 8 student participants achieved a proficient level (85-89) before the utilization of the interactive e-learning supplemental material. The findings show that out of the total sample size of 43 student participants, only 8 individuals were able to demonstrate their proficiency and core understanding in the Cookery Exploratory Course. 10 student participants indicates that the level of proficiency was just starting to learn and can be described at the beginning level (below 74). 7 were identified as being at the minimum in fundamental knowledge and core understanding and can be described at the developing level (75-79). Moreover, 18 students, which is the highest among all participants, demonstrated developed knowledge, core understanding, and skills (80-84), as described in the data result.

Conversely, after the utilization of the interactive e-learning supplemental material, 34 student-participants made it to the advanced level (90–100). This shows that the students were able to attain a level of showcasing their knowledge

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and skills on the topic that goes beyond basic terminology and definitions. Meanwhile, 2 student-participants made it to the approaching proficiency level (80–84) and 7 made it to the proficient level (85–89).

It is shown in the post-test result that there is a significant increase in terms of proficiency development of the student-participants. Hence, the result indicates that the designed learning material can enhance cognitive outcomes by engaging students in interactive learning materials. The result supports the study of Suherman et al., (2022) that the use of e-learning media, such as e-books and multimedia animations, has been associated with improvements in students' understanding, mastery of concepts, and problem-solving skills.

5. Significant difference between the pre-test and post-test scores of the student respondents

Table 5. Significant Difference Between the Pre-test and Post-test Scores

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
POST TEST - PRE TEST	10.465	3.832	.584	9.286	11.644	17.909	42	.000

Table 5 shows that the Sig. (2-tailed) value is 0.000. This represents the two-sided p-value that corresponds to a t value of 17.909 with 42 degrees of freedom. Since the p-value of the test (0.000) is less than 0.05, the null hypothesis is rejected, and the alternative hypothesis is accepted. Therefore, there is a significant difference between the pre-test and post-test scores of the student respondents.

The research findings show that the e-learning interactive supplemental material in Cookery Exploratory aids the student in improving their acquisition of learning. It is essential to assess the extent of learning challenges in online learning settings, ensuring that the complexity of instructional materials matches the needs and abilities of students. The result of the study indicates that the designed learning resource can attain a specific learning outcome and enhance cognitive outcomes by engaging students in interactive learning materials. The result supports the study of Sutini C. et al. (2021), which found that interactive e-learning material can increase active student participation and enhance the quality of learning, hence improving learning outcomes. Interactive learning materials have been widely recognized as a valuable tool to enhance the learning experience across various educational settings. According to the study of Kaewunruen (2019), the incorporation of interactive technology in teaching practices has been shown to enhance student engagement, intrinsic motivation, and overall learning experience. In addition, to the study of Chan et al., (2019), studies have indicated that incorporating e-learning interactions through learning analytics data can enhance academic performance and improve students' learning outcomes. Also, Hill (2019) emphasized that online interactive teaching tools have been found to enhance higher-order thinking skills, communication, and problem-solving competencies.

Overall, the evidence suggests that e-learning materials play a crucial role in enhancing teaching and learning behaviors, leading to improved student performance and engagement. By leveraging innovative technologies and pedagogical approaches, educators can create interactive and engaging e-learning

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materials that cater to diverse learning needs and contribute to more effective learning outcomes.

CONCLUSIONS

The null hypothesis is rejected, and the alternative hypothesis is accepted. Therefore, there is a significant difference between the pre-test and post-test scores of the student respondents. The research findings show that the e-learning interactive supplemental material in Cookery Exploratory aids the student in improving their acquisition of learning. It is essential to assess the extent of learning challenges in online learning settings, ensuring that the complexity of instructional materials matches the needs and abilities of students. The result of the study indicates that the designed learning resource can attain a specific learning outcome and enhance cognitive outcomes by engaging students in interactive learning materials.

RECOMMENDATIONS

Based on the research findings, the researcher recommends the following:

1. The results of the research may serve as the foundation for reassessing the content of the interactive e-learning instructional supplemental material in the Cookery Exploratory course.
2. It is shown that the e-learning material faces technical difficulties since it needs an internet connection. One of the problems faced by the learners is an unstable internet connection. Hence, the result can be utilized for another study to create another learning material that the learners can access offline.
3. Further studies may be suggested to conduct similar research for other grade levels and other subject areas.

REFERENCES

Al-Bargi, A. (2021). Elt online teachers' professional development during the covid-19 pandemic outbreak: perceptions, implications and adaptations. Theory and Practice in Language Studies, 11(10), 1161-1170. https://doi.org/10.17507/tpls.1110.03

Aldiab, A., Chowdhury, H., Kootsookos, A., Alam, F., & Allhibi, H. (2019). Utilization of Learning Management Systems (LMSs) in higher education systems: A case review for Saudi Arabia. Energy Procedia, 731-737.

Andersson, M., Duch, P., Bessmann, E., Lundstrøm, L., & Ekelund, K. (2022). Preparing for obstetric anaesthesia—an educational randomised controlled trial comparing e-learning to written course material. Acta Anaesthesiologica Scandinavica, 67(1), 36-43. https://doi.org/10.1111/aas.14148

Aorus, S., Wikaray, Y., Wisdiarman, W., & Syafei, S. (2020). The Development of Teaching Materials for Micro Teaching Assisted by Learning Videos to Improve Students' Teaching Practice Abilities. Proceedings of the Eighth International Conference on Languages and Arts. https://doi.org/10.2991/assehr.k.200819.002

Batane, T., & Ngwako, A. (2017). Technology use by pre-service

ISSN 3028-2179

teachers during teaching practice: Are new teachers embracing technology right away in their first teaching experience? Australian Journal of Education Technology, 33.

Busljeta, R. (2013). Effective Use of Teaching and Learning Resources. Czech-Polish Historical and Pedagogical Journal, 5(2). doi:https://doi.org/10.2478/cphpj-2013-0014

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., … & Walker, K. (2020). Purposive sampling: complex or simple? research case examples. Journal of Research in Nursing, 25(8), 652-661. https://doi.org/10.1177/1744987120927206

Chan, A., Botelho, M., & Lam, O. (2019). Use of learning analytics data in health care–related educational disciplines: systematic review. Journal of Medical Internet Research, 21(2), e11241. https://doi.org/10.2196/11241

Chew, C., Samah, K., Shahbudin, F., Fu, D., Mulyani, H., & Nugraha, N. (2023). Impact of the covid-19 pandemic on malaysian and indonesian educators in tertiary institutions. International Journal of Evaluation and Research in Education (Ijere), 12(1), 403. https://doi.org/10.11591/ijere.v12i1.23979

Culajara, C. (2022). Maximizing the use of google sites in delivering instruction in physical education classes. Physical Education and Sports Studies and Research, 1(2), 79-90. https://doi.org/10.56003/pessr.v1i2.115

Davidovitch, N. and Wadmany, R. (2021). 2020 – the lecturer at a crossroads of teaching and learning in academia in israel. Journal of Education and E-Learning Research, 8(3), 281-289. https://doi.org/10.20448/journal.509.2021.83.281.289

Dumitrescu, H. (2023). Online education in romania, between challenge and becoming a norm.. https://doi.org/10.15405/epes.23045.119

Gcabashe, N. and Ndlovu, N. (2022). Exploring business studies teachers' technology self-efficacy on their technology integration to create learner-centred teaching environment. International Journal of Learning Teaching and Educational Research, 21(12), 238-259. https://doi.org/10.26803/ijlter.21.12.13

Giyanto, G., Rubini, B., & Heliawati, L. (2020). Characteristics of Chemistry Teaching Material Voltaic Cells on Students' Creativity and Concept Mastery. Jurnal Pendidikan Sains Indonesia, 218-227. doi:https://doi.org/10.24815/jpsi.v8i2.16640

Göksu, İ., Özcan, K., Cakir, R., & Göktaş, Y. (2017). Content analysis of research trends in instructional design models: 1999-2014. Journal of Learning Design, 10(2), 85. https://doi.org/10.5204/jld.v10i2.288

Guo, Y. and Lee, D. (2023). Differential usage of learning management systems in chemistry courses in the time after covid-19. Journal of Chemical Education, 100(5), 2033-2038.

ISSN 3028-2179

https://doi.org/10.1021/acs.jchemed.2c00850

Harsono, Y. (2007). Developing Learning Materials for Specific Purposes. TEFLIN Journal, 18(2). doi:http://dx.doi.org/10.15639/teflinjournal.v18i2/169-179

Hasan, R. and Ahmad, N. (2018). Conceptual framework of scaffolding literacy module to help remedial students mastering reading skills. International Journal of Academic Research in Business and Social Sciences, 8(11). https://doi.org/10.6007/ijarbss/v8-i11/4982

Hill, L. (2019). Blackboard collaborate ultra: an online, interactive teaching tool.. Academy of Management Learning and Education, 18(4), 640-642. https://doi.org/10.5465/amle.2019.0027

Kaewunruen, S. (2019). Enhancing railway engineering student engagement using interactive technology embedded with infotainment. Education Sciences, 9(2), 136. https://doi.org/10.3390/educsci9020136

Kapur, R. (2019). Development of Teaching-Learning Materials. JOUR. Retrieved from https://www.researchgate.net/publication/334083571_Development_of_Teaching-Learning_Materials

Lee, K. (2024). Adoption of the addie approach in an agile way for the development of biochemistry courseware for learning metabolism. Journal of Chemical Education, 101(3), 1292-1301. https://doi.org/10.1021/acs.jchemed.3c00851

Li, Z. (2017). An online interactive courseware for the course of textile materials. International Journal of Emerging Technologies in Learning (Ijet), 12(09), 145. https://doi.org/10.3991/ijet.v12i09.7494

Mahardika, A., Wiranda, N., & Kamal, M. (2023). Web-based interactive learning medium to foster students' understanding on magnetic theory using the tutorial method. Sar Journal - Science and Research, 37-44. https://doi.org/10.18421/10.18421/sar61-06

Maladerita, N., Ananda, A., & Montesori, M. (2023). Discovery learning : implementation in social learning assisted interactive digital teaching materials to improve student learning outcomes. International Journal of Humanities Education and Social Sciences (Ijhess), 2(4). https://doi.org/10.55227/ijhess.v2i4.330

Moore, R. (2016). Developing distance education content using the tappa process. Techtrends, 60(5), 425-432. https://doi.org/10.1007/s11528-016-0094-8

Moreno-Guerrero, A., Rodríguez-Jiménez, C., Navas-Parejo, M., Costa, R., & Belmonte, J. (2020). Whatsapp and google drive influence on pre-service students' learning. Frontiers in Education, 5. https://doi.org/10.3389/feduc.2020.00152

Munyakazi, J., Mukagihana, J., Nsengimana, T., Mukamwambali, C., & Habimana, O. (2022). Impacts of computer-assisted

ISSN 3028-2179

instructions on students' academic performance of biology within secondary schools. International Journal of Learning and Development, 12(2), 81. https://doi.org/10.5296/ijld.v12i2.19766

Nabayra, J. (2022). Mathematics learning in the new normal through teacher-created videos: the freshmen university students' experience. International Journal of Arts and Humanities Studies, 2(1), 22-27. https://doi.org/10.32996/bjahs.2022.2.1.4

Nalliah, R. and Allareddy, V. (2014). Weakest students benefit most from a customized educational experience for generation y students. Peerj, 2, e682. https://doi.org/10.7717/peerj.682

Nisa, K. and Lolytasari, L. (2022). E-learning madrasah: exploring students and teachers' interactions to support literacy.. https://doi.org/10.2991/assehr.k.220104.039

Novia, Y., Rozimela, Y., & Zaim, M. (2022). Developing e-modul based mobile learning as an interactive media. International Conference on Research and Development (Icorad), 1(1), 132-142. https://doi.org/10.47841/icorad.v1i1.19

Oliveira, G., Teixeira, J., Torres, A., & Morais, C. (2021). An exploratory study on the emergency remote education experience of higher education students and teachers during the covid-19 pandemic. British Journal of Educational Technology, 52(4), 1357-1376. https://doi.org/10.1111/bjet.13112

Pedro, N., Lemos, S., & Wunsch, L. (2011). E-learning Programs in Higher Education: Benefits and Limits from Students' Pespective. IATED Digital Library, 2047-2056.

Permatasari, M., Murdiono, M., & Puspitasari, C. (2022). The use of google sites in civic education learning in the covid-19 pandemic era. Jurnal Civics Media Kajian Kewarganegaraan, 19(2), 288-302. https://doi.org/10.21831/jc.v19i2.46750

Pribadi, B. and Chung, K. (2023). Designing online learning: comparative study between indonesian open university and korea national open university. International Journal of Instruction, 16(2), 643-660. https://doi.org/10.29333/iji.2023.16234a

Reid, L. (2019). Learning management systems: the game changer for traditional teaching and learning at adult and higher education institutions. Global Journal of Human-Social Science, 1-14. https://doi.org/10.34257/gjhssgvol19is6pg1

Reiser, R. (2001). A history of instructional design and technology: part ii: a history of instructional design. Educational Technology Research and Development, 49(2), 57-67. https://doi.org/10.1007/bf02504928

Rezaee, R., Danaei, M., & Askarian, M. (2014). The efficacy of teaching hand hygiene to medical students: an interventional study. International Journal of Academic Research in Business and Social Sciences, 4(9). https://doi.org/10.6007/ijarbss/v4-i9/1138

Richley, R. C. (1994). Developmental Research: The Definition and Scope. Detroit, MI 48202: ERIC. Retrieved from https://files.eric.ed.gov/fulltext/ED373753.pdf

Schleicher, A. (2016). Teaching Excellence through Professional

ISSN 3028-2179

Learning and Policy Reform ; Lessons from around the World. Paris: OECD Publishing. doi:https://doi.org/10.1787/9789264252059-en.

Smale-Jacobse, A. E., Meijer, A., Helms-Lorenz, M., & Maulana, R. (2019). Differentiated Instruction in Secondary Education: A Systematic Review of Research Evidence. SYSTEMATIC REVIEW article, 10. doi:https://doi.org/10.3389/fpsyg.2019.02366

Song, D., & Bonk, C. (2016). Motivational factors in self-directed informal learning from online learning resources. (R. M. English, Ed.) Cogent Education. doi:10.1080/2331186X.2016.1205838

Song, J. and Tombs, M. (2022). Teaching medical students about kawasaki disease: the development and evaluation of a digital educational resource.. https://doi.org/10.1101/2022.10.01.22280590

Sriphon, T. (2022). Student satisfaction with online learning during covid-19.. https://doi.org/10.33422/5th.iaceducation.2022.07.09

Sufyan, A., Hidayat, D. N., Lubis, A., Kultsum, U., Difianty, M., & Suralaga, F. (2020). Implementation of E-Learning During a Pandemic: Potentials and Challenges. 8th International Conference on Cyber and IT Service Management (CITSM), 1-5.

Suherman, A., Komaro, M., & Ana, A. (2022). E-book multimedia animation implementation on concept mastery and problem-solving skills of crystal structure subjects in engineering materials course. Indonesian Journal of Science and Technology, 259-280. doi: https://doi.org/10.17509/ijost.v8i2.55320

Sutini, C., Emzir, & Raysid, Y. (2021). The Relevance of Reading Teaching Material Using New Technology. Journal of Physics: Conference Series. doi:10.1088/1742-6596/1764/1/012145

Talbert, R. and Mor-Avi, A. (2019). A space for learning: an analysis of research on active learning spaces. Heliyon, 5(12), e02967. https://doi.org/10.1016/j.heliyon.2019.e02967

Thambirajah, J., Krish, P., & Shaari, A. (2022). The Acquisition of Technical Terms using the Online Learning Approach among Aircraft Maintenance Learners. 3L the Southeast Asian Journal of English Language Studies, 211-223. doi:https://doi.org/10.17576/3l-2022-2802-14

Unger, S., Simpson, C., Lecher, A., & Goudreau, S. (2022). Student perceptions of hybrid courses in higher education. Online Learning, 26(4). https://doi.org/10.24059/olj.v26i4.2939

Utafumi, Y. P., & Cahyono, D. D. (2020). Study at home: analisis kesulitan belajar matematika pada proses pembelajaran daring. Jurnal Ilmiah Matematika Realistik, 20-26. doi:https://doi.org/10.33365/ji-mr.v1i1.252

Zaitun, Z., Hadi, M., & Harjudanti, P. (2021). The impact of online learning on the learning motivation of junior high school students. Jurnal Studi Guru Dan Pembelajaran, 4(2), 263-271. https://doi.org/10.30605/jsgp.4.2.2021.569

ISSN 3028-2179