INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT

OPEN ACCESS JOURNAL

Vol 12, Issue 1, (2023) E-ISSN: 2226-6348

Learner-Centred Instructional Approach in Supporting Performances in Open Distance Learning

Azlan Abdul Aziz[1], Ahmad Kamalrulzaman Othman[2], Yusnita Sokman[2], Mohd Hafizan Musa[2], Nurhafizah Azizan[2]

[1]Kolej Pengkomputeran, Informatik dan Media, Universiti Teknologi MARA Cawangan Melaka, Kampus Jasin, 77300 Merlimau, Melaka, Malaysia, [2]Kolej Pengkomputeran, Informatik dan Media, Universiti Teknologi MARA Cawangan Johor, Kampus Segamat, 85000 Segamat, Johor, Malaysia

Email: azlan225@uitm.edu.my, ahmad177@uitm.edu.my, yusni996@uitm.edu.my, mohdh233@uitm.edu.my, nurha175@uitm.edu.my

To Link this Article: http://dx.doi.org/10.6007/IJARPED/v12-i1/16611 DOI:10.6007/IJARPED/v12-i1/16611

Published Online: 16 March 2023

Abstract

Digital learning materials, especially multimedia instructional materials or courseware are prevalent in the fabric of higher education today. While various names such as educational resources, instructional resources, instructional materials, learning materials, learning resources etc. have been used to manifest the concept of learning contents, the definitive goal is to support in catering education especially for distant learners. The use of instructional multimedia is acknowledged to help overcome some of the challenges in the Open Distance Learning (ODL) curriculum delivery since adult learners typically study in isolation with reduced opportunities for direct instructions. They are supposed to pursue their study self-guided with the aid of instructional materials. The use of instructional multimedia can help to create an interactive and engaging learning experience as highlighted by several research papers on the successful distance learning materials where the success has been measured with respect to learners' satisfaction and perceived learning effectiveness in supporting the learners' achievement in assessments. A quality instructional material is believed to be well supported and founded by suitable learning theory in its design as it is considered as a key factor to determine its success. Therefore, this paper described the effects of such design and development of a multimedia instructional material to motivate adult learners to learn about the basics of Multimedia. The implementation of Gagne's nine events of instruction is hoped to provide a better design framework for the development of instructional materials to meet the needs of adult learners in distance education. As with any other research, further study should be done on relatively larger random samples of respondents to focus on the evaluation of this design framework to gain additional credibility.

Keywords: Digital Instructional Material, Gagne Model, Adult Learners, Open Distance Learning, Academic Performance

Introduction

The technological advancement permeates the lifelong learning landscapes of non-traditional students in distance education with computers and digital devices as mediums to deliver teaching and learning. Currently, e-learning is widely used in Malaysia higher education as a tool for adult learners who learn differently from the traditional learners with the former having varied and complex background with collected experience and commitment (Malone, 2014). An adult learner usually enrolls on a part-time basis taking blended delivery systems which separates them from the time and location-based class activities (Abdul Aziz et. al., 2014). As such online education is seen as an increasingly popular medium of instructional materials for higher and distance education. According to Fink (2013), an online course needs to be designed systematically for it to be effective and "provide significant learning experience". Instructional materials also must be constantly developed and upgraded to meet the adult learners' needs in a distance education environment (Kryshtanovych et al., 2020; Castro & Tumibay, 2021; Kara et al., 2019).

The Open and Distance Learning program is targeted at self-guided learning because of the minimum level of face-to-face learner-instructor interaction. The tools of online learning vary such as courseware, learning management system, assessment tools, virtual, and remote laboratories are often use in blended and distance learning (Sancristobal et al., 2012). Learners in such schemes are required to follow their research with the aid of learning materials and all potential forms of support services, such as counseling, training classes, seminars, courses, hands-on activities, discussion groups, etc. Multimedia instructional materials can accommodate multiple ways in which learners can view and explore learning materials. It is known that the use of computer-based multimedia has advantages. One of its advantages is that computers can be designed to allow users to control both the viewing conditions and what is viewed, and to provide interactive learning (Jono et al., 2016). The potential of managing viewing conditions and what is presented help a material developer to customize the knowledge and activities to the level of competency of the students and discuss their individual interests. Abdul Aziz et al (2016) noted that the resources should be properly designed to support the use of technology to enhance learning and to enable students to achieve a deeper understanding of the teaching materials. Noting these details, this research sought to develop learning materials to improve adult learners academic understanding and achievement.

Vasconcellos (2020) reaffirmed the significance of the course's structure and content in eliminating information gaps that can increase learners' discontent and increase the likelihood of dropout. Poorly developed and ineffective learning materials are some of the factors that caused adult learners to leave their program (Faulk & Carbery, 2019; Brown, 2017). Onyilagha and Nnajiofor (2016) mentioned that the acquisition of knowledge is restricted if the materials are weak, incorrectly organized, or otherwise compromised. When the learners' engagement with the content serves as the cornerstone upon which other types of interaction overlap, the instructional material is fundamental to the learners' academic journey even in an ODL scenario. It is affirmed that when instructional materials for adult learners are developed using strong instructional design principles to support goal-oriented, self-paced learning, their learning experience is improved (Karthik et al., 2019) as well as improved their motivation while gaining valuable information from the process (Mayer, 2017). In the context of distance education, learning materials need to be developed

according to the suitability of their learners such as considering their experiences following a learning course so that they are motivated to learn (Kara et al., 2019).

Literature Review

An efficient and structured course design reduces the amount of time students must spend familiarizing themselves with the course structure thereby devoting more time to learning materials that can lead to improved learning outcomes (Ralston-Berg et al., 2015). Unlike the traditional students, adult learners do not have as much time to devote to their learning. As such the learning materials need to be designed and developed efficiently.

According to Jaggers and Xu (2016) there are four design features that can influence students' course learning outcomes: (1) organization and presentation, (2) learning objectives and assessments, (3) interpersonal interaction, and (4) use of technology. Ralston-Berg (2014) surveyed students to determine the most critical factors contributing to their success in online education. A well-organized course that is user-friendly and easy to navigate was the highest-rated factor. Therefore, course design must ensure ease of use from the student's perspective.

Such studies show that successful online courses include a variety of media that appeal to different learning styles, provide a medium for regular and high-quality learner-instructor interaction, are user-friendly / easy to access, and use richer media formats. Gagne's nine events of instruction are designed to facilitate engaging and substantive instruction (Gagne et al., 2005). Gagne believes that for the intended learning results to occur, different types of learning require a different instructional environment. This paper is based on the following "events" that must be addressed for learning to effectively occur:

Table 1
Gagne Nine Events of Instructions (Gagne et al., 2005) and the internal cognitive process (McNeill & Fitch, 2022)

Instructional event	Cognitive process
1. Gain attention.	*Reception of pattern of neural impulses*
2. Inform learners of objectives.	*Activating the process of executive control*
3. Stimulate recall of prior learning.	*Retrieval of prior learning to working memory*
4. Present the content.	*Emphasizing features for selective perception*
5. Provide "learning guidance."	*Semantic encoding; cues for retrieval*
6. Elicit performance (practice).	*Activating response organization*
7. Provide feedback.	*Establishing reinforcement*
8. Assess performance.	*Activating retrieval; making reinforcement possible*
9. Enhance retention and transfer to the job.	*Providing cues and strategies for retrieval*

Solanki (2014) presented a framework using Gagne's nine events of instructions that incorporated various multimedia elements into the online classroom to trigger each of the nine events. Post-course evaluations from students revealed that "incorporating several forms of multimedia, in addition to the traditional course components such as lecture notes and chapter summaries, improved students' retention of the material and catered to multiple

learning styles". Miner et al (2015) evaluated the effectiveness of incorporating Gagne's nine events of instruction into online nursing education course design via student feedback using end-of-course surveys. Their research within three consecutive semesters, showed that integrating Gagne's events increased students' passion, comprehension for the subject and eventually their final grades. Gagne's systematic approach addresses the conditions of learning which is based on an information-processing model of the mental events that occur when adults are presented with various stimuli.

Multimedia

Liang et al (2019) stated that multimedia courseware is one of the effective online tools if it is designed appropriately to match the specific needs of learners. In the same study, they stressed that multimedia is an immersive medium that incorporates a range of elements, including text, graphics, audio, video, and animation, which can stimulate students ' attention. Most students are not only tactile or visual readers, but also multi-sensory learners and multimedia can capture the interest of the learners because it covers a range of learning styles.

This interactive multimedia approach is effective in making students comfortable with different courses and reducing the time each student takes to understand the learning structure, thus allowing students to spend more time understanding the course content (Essel et al., 2016). The use of courseware affords the flexibility to learners, encourages self-learning and promotes learner-content interaction (Sandanayake, 2019). Multimedia creates excellent opportunities in supporting and visualizing the content thus optimizing the learning process by making the content clear and easily understandable for the learners (Liang et al., 2019). Multimedia learning tools have been used at all stages of learning in our techno-driven culture, but their practical usefulness is difficult to quantify owing to the close relationship between instructional philosophy and interface design. With the emerging numbers of multimedia applications and services for the past decade, a super large amount of multimedia data has been produced for the purpose of advanced research in multimedia on image/video content analysis, multimedia search and recommendation, multimedia streaming, multimedia content delivery etc (Xin Wang. et al., 2020). In this study, multimedia is used to design and develop the instructional material based on Gagne's nine events of instruction.

Application of Gagne in the Design of Digital Instructional Material

The use of Gagne's nine events of instruction provides a structured framework for planning, designing, and developing effective instructional lessons using various delivery techniques. This framework provides a holistic view involving nine activities namely: Gaining attention, informing the learner of the objective, stimulating recall of prior learning, presenting the stimulus, providing learning guidance, eliciting performance, providing feedback, assessing performance, and enhancing retention and transfer, into the teaching and learning processes.

Event 1: Gain Attention

Prior to learning, it is important to capture the attention of the learners. Presenting a new problem / question or situation related to their learning at work enables students to gain attention so that they can see or listen during learning (Cheung, 2016; Jokinen & Mikkonen, 2013). The use of humor, anecdotes, and case studies to emphasize facts in teaching are some of the examples that can draw attention (Cheung, 2016). Davies et al. (2018) mentioned that

the use of cartoon, humor, an interesting quote or fact, stories, audio, or video clips can enhance learning receptivity. Gagne's instructional design gains attention by using video accompanying images, text information in the form of questions, sounds and colors as background to engage students. At the beginning of the lesson, the use of video portraying the overview of interactive multimedia and where it is being implemented is a worthwhile emphasis in attracting the learner's attention to the course. Such a reinforcement is hoped to trigger the learners' intrinsic motivation and assist in their learning autonomy.

Event 2: Inform Learners of Objectives

Informing students of the learning objectives presented before the learning process helps to motivate students to collaborate with the entire activity and indicate how the newly gained knowledge or skills can be significant to their future. Through the learning objectives, adult learners are better prepared to initiate the learning session which places them in a thinking frame that is relevant to the topic and future learning activities (Baba et al., 2017; Jaiswal, 2019). The learning objectives explained to these adult learners at the beginning of each lesson can indirectly assist in the student's orientation to cooperate with all activities related to the learning objectives. When these learners understand the relevance of the learning task, they will engage and actively be involved with the lessons. Besides informing of the objectives, encouraging questions, and providing clarifications to clear perceptions of learning outcomes, distributing, and explaining the grading rubrics for a standard performance help the learners to communicate and handle expectations of what can be accomplished. Some examples of course topics objectives in the course are a) Identify the elements of multimedia implemented in the various domains such as education, business, home and public places and b) Correctly describe the related technology and its application stemming from multimedia.

Event 3: Stimulate Recall of Prior Learning

Prior learning can help to remember information more easily as it supports students to improve the information that has been recorded into the long-term memory (Gagne et al. 2005; Kruse, 2010). Before learning begins, instructors need to stimulate students' memory by associating new information with what they have learned, content and knowledge of what they have already learned. Combining new information with prior knowledge can facilitate the learning process. There are questions to relate and focus on the previous technologies in the learners surrounding and link them to the existing knowledge within multimedia.

Event 4: Present the Content

To adapt to different learning modalities, various media should be used where possible, including text, graphics, audio narratives, and video. This is important to emphasize the most important piece of new information (Meij & Merx, 2018). Instructors need to have a better way of presenting content through the same graphics, animations, or text sequences to draw attention to the most important parts when using text in information delivery. Instructors can follow one of two concept presentation patterns such as explaining the concept followed by a few examples or showing some examples, and then explaining the concept (Jono et al., 2016). Presenting the content must take into consideration the organization, flow, types of media for delivery, the way new chunks of information being presented and avoiding cognitive overload. It is best to provide proper instructions to guide students to focus on the most important concepts being presented. Such selective perception includes concentrating the already-attained attention, and after inducing the recall of existing knowledge then only

new information can be given (Gagne et al., 2005). In relation to the multimedia course, some practical strategies to present the stimulus include using cues for teaching, explaining specific terminologies or concepts, describing the various tools used in multimedia, and explaining with examples the application of multimedia in the real-world environment.

Event 5: Provide "Learning Guidance"

Providing guidance in determining the right path is a necessity and responsibility to support efforts in creating a continuity between students and the content being learned (Lee & Lee, 2012). Facilitator helps students to determine their own interactions with the relevance of prior knowledge and new content learned. To help students better encode information for long-term storage, practical guidance strategies include use of examples, case studies, symbols, graphical representations, mnemonics, and analogies to facilitate learning to create a seamless learning process.

Event 6: Elicit Performance (Practice)

Students need to be given the opportunity to showcase their abilities once they have passed through the course. This phase enables the instructor / facilitator to determine whether students are achieving the required competencies based on the teaching objectives and if the objectives have been met then their meaning and relevance have been enhanced (Baba, 2017). Generally, learning is not recognized until the students are given the chance to do something or act on the information they receive and seek positive input from the instructor.

Event 7: Provide Feedback

Feedback can be defined as information of one's performance (Hattie & Donoghue, 2016). Formative assessment is considered to be effective for learning when time and quality feedback is afforded to the learners (Jaiswal, 2019). Exercises and questions provide an opportunity for feedback that confirms the student's answer is correct or indicates that it is incorrect, and that feedback strengthens the probability of a correct response and reduces the probability of subsequent incorrect response (Philips et al., 1988). Savvidou (2018) defines feedback as information that consists of two components: validation and explanation. Validation is the conclusion that the initial response was right or wrong, while the explanation contained all the substantive information contained in the feedback message. Several types of feedback can be used, including confirmatory feedback (to let the learner know that they did what they were supposed to do), corrective feedback (to let the learner know that their response was accurate), remedial feedback (to point the learner in the right direction to find the right answer without actually giving the right answer), and informative feedback (to give the learner new, additional related information to show that they are paying attention to what they are being told) (Jaiswal, 2019).

Event 8: Assess Performance

An important aspect of learning is summarizing the achievement of desired learning outcomes through assessment and improvement in the way students acquire, process and synthesize information and subsequently improve their knowledge and skills (Hattie & Donoghue, 2016). Educators need to test learners to determine whether they have achieved the desired learning goals and monitor their progress to assess the efficacy of the instructional activities A lot of researchers in this domain have outlined some effective evaluation strategies such as using gamification as an assessment tool, strategic questioning techniques,

or paper-based class quizzes, tests, and exams, giving written assignments, embedding oral questions during class instructions, encouraging peer/group review of class presentations, and using a learning management system for learners knowledge sharing and assessment in an effective virtual learning environment (Jaiswal, 2019).

Event 9: Enhance Retention and Transfer to the Job

New concepts or skills learned require effort to maintain knowledge and skills aimed at avoiding forgetting information and maintaining students' ability to remember and use new information (McKinney, 2012). In this stage, learners can reinforce and internalize new learning and new knowledge by applying them to new contexts. The use of summaries, relating new content to a relevant life experience, encouraging inquiry-based learning, and asking deep-learning questions are some useful approaches for internalizing new knowledge (Jaiswal, 2019) and help learners remember the content of what they are learning, maintaining, and developing their knowledge and skills. The use of this technique can help students remember and expand their knowledge. The experiential learning opportunities help in retention and when the learners can transfer their new learning to new situations, this indicates that they have retained the newly acquired knowledge or skills.

Methodology

This study adopted a quantitative method to examine the statistical possibility of adult learners' performance differences prior and after using the digital instructional material that applied the learner-centred approaches i.e., Gagne's nine events of instructions. This involved only one chapter from the course i.e., Introduction to Interactive Multimedia. The research questions concerning this study was intended to reflect the learners general experience and academic performance after going through the lesson using the digital instructional material developed in accordance with Gagne's nine events of instruction.

Participants

The participants were 28 adult learners (ten males and eighteen females) enrolled in a non-computing program at a public university in central Malaysia. These adult learners registered for the compulsory university course that is Introduction to Interactive Multimedia within the first semester at the undergraduate level. The participants were selected from the same class (one group) through purposive sampling and demographically, they represented a homogenous population and were unknown about Gagne's nine events of instruction. This group of participants are labeled as the experimental group.

Ethics

The institution handling the adult learners' administration has agreed and approved of the data collection method involving the learners on the grounds that the learners were not reorganized into different classes. The participants were informed that their information is strictly confidential and was to be involved directly in this study. Participants were allowed to withdraw from the study at any time.

Data Collection

The study adopted the quasi-experimental approach with both a pre-test and post-test (referred as achievement test) administered to collect data about the adult learners' before and after the implementation of the learner-centred approach (digital instructional material

developed based on Gagne's nine events of instruction). Prior to using the digital learning material based on Gagne's nine events of instruction, the learners sat for the pre-test and the duration was one hour. After that, the digital instructional material that applied the learner-centred approach which is Gagne's nine events of instruction was given to the learners over the course of two weeks. The learners were to use the digital learning materials for study and revision. After that, the learners sat for the post-test which lasted for one hour. Both the test sets consisted of 20 objective questions (on the multimedia elements and features) and 5 subjective questions (on multimedia applications) were designed to include different level of difficulty – easy, intermediate, and hard questions, and adopted selected levels from the Bloom Taxonomy such as knowledge, understanding, and application. The three subject matter experts who oversaw the course at the faculty had revised and approved the test question paper.

Analysis and Result

The scores of the pre-test and post- test scores from the single experimental group were compiled and were entered into the statistical tool SPSS. The data was collected, tabulated, and then analyzed. Descriptive statistics using the mean and standard deviation and inferential statistics were applied to examine if there is a significant difference between the adult learners' performance on the pre-test and post-test scores after the intervention.

Based on the evaluation analysis of quantitative data on the learners' performance, it is noted that the adult learners' performance had improved through the digital instructional material which was designed on the Gagne's nine events of instruction. This cognitive theory of Gagne's had a statistically and significantly positive impact on the learning process done by the learners. It had the indication that the digital instructional material had helped to improve the learners understanding and knowledge of the multimedia elements and applications within the course albeit in only one chapter. Table 2 provided all the values that reflects the improved performance of the adult learners in the experimental group such as the minimum and maximum marks scored on both the pre-test and post-test, the Mean and the standard deviation (SD). The score of ($t(28) = 16.3$; $p=.00$ ($p < 0.05$)) indicates that there is a significant difference between the performance of the adult learners on the pre-test (Mean=15.50, SD=3.33) and post-test (Mean=28.14, SD=2.35) in the experimental group.

Table 2
Descriptive and Inferential Analysis of Achievement from the Experimental Group

Experimental Group	**N**	**Test Marks**		**Mean**	**SD**	**p-value**
		Min	**Max**			
Pre-test	28	9.00	22.00	15.50	3.33	.00
Post-test	28	24.00	33.00	28.14	2.35	

In the distance education environment involving adult learners, Gagne's instructional design provided the distance learning educators with a systematic framework for developing effective digital instructional materials. The implementation of the nine events of instruction led to the development of well-received and engaging digital instructional materials that had helped the adult learners enjoy a better learning experience and performance as manifested by the achievement of better marks in the post-test.

Conclusions

Due to the reduced direct instructions and isolation of adult learners with their instructors and institutions, the adult learners must rely on their distance learning instructional materials in their pursuit of academic achievement. This reliance on the instructional materials defines the importance of a carefully designed and developed digital instructional materials that meet the need of the adult learners. As such, this paper described the importance of implementing an instructional design theory to be the fundamental support in the design and development of digital instructional materials. Gagne's nine events of instruction were used in this study to provide the structure and framework for the learning activities in the digital instructional material for the adult learners. It is believed that a systematic implementation of such a framework for the instructional material design allows the adult learners to better achieve their expected learning outcomes and improve their performance. It is important to align the adult learners' needs, the course learning goals to the teaching and learning activities in distance education. Generally, such an approach is considered a best practice and using Gagne as an instructional design strategy provides clarity to the learners. The outcome of this study has indicated that the adult learners who were involved in the evaluation has performed generally well after using the digital instructional materials that was designed and developed in accordance to Gagne's nine events of instructions model. Thus, it can be said that the Gagne's nine events of instructions is a reliable framework to design and develop digital instructional materials for the use of adult learners in the distance education realm. Such contribution is possibly useful and beneficial in other courses in the other distance education programs. However, there is still a need to conduct an evaluation with a greater number of students as well as on various courses on the proposed design to validate that the design does contribute to the adult learners' better overall academic performance.

References

Abdul Aziz, A., Ibrahim, M., Jono, M. N. H. H., & Asarani, N. A. M. (2014). Incorporating instructional design and adult learning theory in the e-Content development of an interactive multimedia course. In the P*roceedings of the 2014 International Symposium on Technology Management and Emerging Technology.*

Abdul Aziz, A., Suleiman, N. S., & Zahari, M. A. S. (2016). A study on the effectiveness of multimedia instructional materials for adult learners. *Journal of Applied Environmental and Biological Sciences, 6*(10), 47-56.

Baba, J., Sale, P., & Zirra, B. (2017). Applying Gagne's nine events in designing a multimedia programme for teaching elements and principles of design in secondary school. *Arts and Design Studies*,*54*.

Brown, C. G. (2017). The persistence and attrition of online learners. *School Leadership Review,12*(1)

Castro, M. D. B., & Tumibay, G. M. (2021). A literature review: efficacy of online learning courses for higher education institutions using meta-analysis. *Education andInformationTechnologies,26*(2),1367-1385.https://doi.org/10.1007/s10639-019-10027-z.

Cheung, L. (2016). Using an instructional design model to teach medical procedures. *Med.Sci.Educ*,*26*,175–180.

Davies, M., Pon, D., & Garavali, L. (2018). Improving pharmacy calculations using an instructional design model. *Am J Pharm Educ.*,*82*(2).https://doi.org/10.5688/ajpe6200.

Essel, H. B., Osei-Poku, P., Tachie-Menson, A., & Opoku-Asare, N. A. (2016). Self-paced interactive multimedia courseware: A learning support resource for enhancing electronic theses and dissertations Ddvelopment. *Journal of Education and Practice, 7*(12).

Faulk, N., & Carbery, A. (2019). Using motivation theory and research when teaching information literacy online. In: Steiner, S. K. dan Rigby, M. (ed.) Motivating students on a time budget: pedagogical frames and lesson plans for in-person and online information literacy instruction. *Chicago: Association of College and Research Libraries*,85-94.

Fink, L. (2013). *Creating significant learning experiences: An integrated approach to designing college courses*. John Wiley & Sons.

Gagne, R. M., Wager, W. W., Golas, K. C., Keller, J. M., & Russel, J. D. (2005). *Principle of instructional design* (5th Ed.). Thomson Learning, Inc.

Hattie, J. A. C., & Donoghue, G. M. (2016). Learning strategies: A synthesis and conceptual model. *npj Science of Learning,1*(1),1-13.

Jaggers, S., & Xu, D. (2016). How do online course design features influence student performance?*Computers&Education,95*,270–284. 10.1016/j.compedu.2016.01.014.

Jaiswal, P. (2019). Using Learner-centered instructional approach to foster students' performances. *Theory and Practice in Language Studies,9*(9),1074-1080. http://dx.doi.org/10.17507/tpls.0909.02.

Jokinen, P., & Mikkonen, I. (2013). Teachers' experiences of teaching in a blended learning environment. *Nurse Education in Practice*,*13*(6),524-528.

Jono, M. N. H. H., Hasanordin, R., Salleh, S., Ibrahim, M., Aziz, A. A., & Asarani, N. A. M. (2016). Measuring the effectiveness of courseware content using learning theory for a programming subject. In: Luaran J., Sardi J., Aziz A., Alias N. (eds) *Envisioning the Future of Online Learning*. Springer.

Kara, M., Erdogdu, F., Kokoc, M., & Cagiltay, K. (2019). Challenges faced by adult learners in online distance education: A literature review. *Open Praxis, 11*(1), 5–22. https://doi.org/10.5944/openpraxis.11.1.929.

Karthik, B., Chandrasekhar, B., David, D., & Kumar, D. (2019). Identification of instructional design strategies for an effective e-learning experience. *The QualitativeReport*,*24*(7),1537-1555.https://doi.org/10.46743/2160-3715/2019.3870.

Kruse, K. (2010). Gagne's nine events of instruction: An introduction. http://www.e-learningguru.com/articles/art3_3.htm.

Kryshtanovych, M., Gavrysh, I., Khltobina, O., Melnychuk, I., & Salnikova, N. (2020). Prospects, problems and ways to improve distance learning of students of higher educational institutions. R*evista Romaneasca pentru Educatie Multidimensionala, 12*(2), 348-364. https://doi.org/10.18662/rrem/12.2/282.

Liang, D., Qu, Y. X., & Zhang, S. (2019). Research on multimedia teaching of physical education class based on online physical education curriculum construction. In *2019 5th International Workshop on Education, Development, and Social Sciences.*

Lee, J., & Lee, Y. J. (2012). Development and application of e-Learning content for advertising education. *International Journal of Advanced Science and Technology*, *47*, 1–12.

Malone, S. (2014). Characteristics of adult learners. *Training and Development*, *41* (6),10-14.

Mayer, R. E. (2017). Using multimedia for e-learning. *Journal of Computer Assisted Learning*,33, 403–423.

McKinney, B. (2012). *Exploring interactive whiteboard use in the 4–6 grade classroom using Gagne's nine events of instruction.* The University of Alabama Tuscaloosa.

Miner, A., Mallow, J., Theeke, L., & Barnes, E. (2015). Using Gagne's 9 events of instruction to enhance student performance and course evaluations in undergraduate nursing courses. *Nurse Educator*, 40(3), 152–154.

Onyilagha, J. C., & Nnajiofor, F. N. (2016). Comparative study of the impact of instructional materials and technology on traditional and distance education systems. *International Journal for Innovation Education and Research ,4* (2),71-78.https://doi.org/10.31686/ijier.vol4.iss2.519.

Phillips, B. (2017). Student-Produced podcasts in language learning - exploring student perceptions of podcast activities. *IAFOR Journal of Education*, 5(3), 157-171.

Ralston-Berg, P. (2014). Surveying student perspectives of quality: Value of QM rubric items. *Internet Learning*, *3*(1), 117–126.

Ralston-Berg, P., Buckenmeyer, J., Barczk, C., & Hixon, E. (2015). Students' perceptions of online course quality: How do they measure up to the research? *Internet Learning Journal*, 4(1), 38–57.

Sandanayake, T. C. (2019). Promoting open educational resources-based blended learning. *International Journal of Educational Technology in Higher Education*, *16*(1), 1-16.

Savvidou, C. (2018). Exploring the pedagogy of online feedback in supporting distance learners. *In Núria Llevot-Calvet (Ed.) Advanced Learning and Teaching Environments - Innovation, Contents and Methods*.IntechOpen.

Solanki, R. (2014). Developing instructional multimedia modules incorporating Gagne's nine events of instruction. *Journal of Education, 2*(1), 1–16.

Vasconcellos, I. M., Robaina, D. T., & Bonanni, C. (2020). Factors influencing students' decision to drop out of online courses in Brazil. *Journal of Education and Learning, 9*, 284. https://doi.org/10.5539/jel.v9n5p284.

Meij, W. L., & Merx, S. (2018). Improving curriculum alignment and achieving learning goals by making the curriculum visible. *International Journal for Academic Development*, *23*(3),219–231.