

The Development of Aerobic Dance (ADa) Modules and Its Effectiveness Towards Cognitive Development of Students with Learning Disabilities at Secondary School Putrajaya, Malaysia

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To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v13-i5/17098> DOI:10.6007/IJARBSS/v13-i5/17098

Published Date: 04 May 2023

Abstract

Based on the Malaysian Education Development Plan 2013-2025, the objective of education is to produce knowledgeable and skilled people to succeed in life. Every student must master the skills of reading, writing, counting and high-level thinking skills (Kementerian Pendidikan Malaysia, 2013). 21st Century Education aims to equip the skills of students with a variety of skills in preparation for the future. 21st century skills include communication, science, and technology, thinking, interpersonal, reading, counting, and writing skills. It involves cognitive development of the student. Cognitive is the ability of individuals to think, give opinions, understand, remember things that happen in their respective environments. It involves mental activities such as memory, categorizing, planning, reasoning, problem solving, creating, and imagining. Therefore, the ADa module focused on the cognitive development of students with learning disabilities which also practice the 21st century skills that students need. The cognitive development involves cognitive skills that are the ability of pupils to think, give opinions, understand, remember things that happen in their respective environments. It involves mental activities such as memory, categorizing, planning, reasoning, solving problems, creating imagination and others. The ADa module can provide teachers with guidance and reference about aerobic dance intervention for learning disabilities student.

Keywords: Teaching Module, Aerobic Dance, Cognitive Development, Learning Disabilities.

Background

Special needs students with learning disabilities problems are students who have been identified and have been certified by clinical professionals as having a disability that interferes with the learning process (Kementerian Pendidikan Malaysia, 2015). While Liang and Li (2019) in Wan Fatul and Alias (2020) stated that children with learning disabilities show clear

difficulties in meta memory, working memory and short-term memory. Several studies have also shown that children with learning disabilities have varying degrees of difficulty in the analysis of assignment needs, selection of suitable strategies, allocation of learning time, monitoring and control of the learning process and assessment results. These components are an important aspect of the development of a student's cognitive skills. Cognitive skills are important for an individual's survival. The development of cognitive skills emphasizes the thought processes of a student. It centers on the change of children's thinking that occurs from one stage of development to the next. The cognitive development of the student can also be attributed to the child's health. Good overall health can be achieved by the involvement of the students in physical activity or sports. Regular physical activity such as exercise has beneficial implications for our daily life especially in the development of brain function. In addition to the traditional form of daily physical activity, there are various forms that are more interesting and motivating compared to some previous forms of exercise. (McKenzie et.al., 2018).

Students with learning disabilities are usually weak in observation including concentration, attention, memory and thinking or processing (Kementerian Pendidikan Malaysia, 2015). This situation causes them to be weak in mastering the skills of reading, writing, counting, and thinking. According to the Malaysian Education Development Plan 2013-2025, the goal of education is to produce knowledgeable and skilled people to succeed in life. With that, every student needs to master the skills of reading, writing, counting and high-level thinking skills (Kementerian Pendidikan Malaysia, 2013). Manisah and Norizza (2016) stated special need students with learning disabilities as children who are different from normal children because they are at risk in terms of understanding, remembering, and storing information due to their weakness to focus. These characteristics are an important aspect in the cognitive development of students at school. Physical activity is consistently beneficial in improving the physiological and psychological functions of students with learning difficulties (Raj, 2016). Therefore, a teaching module in the form of physical training needs to be designed to help students with learning disabilities to help them overcome this problem. In the 2020 Malaysian Education Development Plan Annual Report (Kementerian Pendidikan Malaysia, 2021) states that one of the efforts to improve access and quality of education for special needs students is through the empowerment of teachers with the production of standard training modules in special education.

The element of concentration is very important in the world of education. Concentration skills help improve skills needed in school such as concentration skills on what is taught during the teaching and learning process. According to Dogru (2014) believes that concentration is a skill that is acquired and improved through repeated training. Students with learning disabilities have difficulty following instructions and are weak in focusing because they are easily distracted (Zalizan, 2009 in Manisah and Norizza, 2016). Therefore, teaching aids visually or interactively help in increasing the level of students' concentration and interest, further increasing their level of understanding (Kementerian Pendidikan Malaysia, 2017). In the ADa module, aerobic dance training is suggested as one of the various teaching methods to improve students' concentration for students with learning disabilities. In the study conducted by Zinealabidine et.al (2021) proved that 8 weeks of aerobic exercise program can promote the executive function of cognitive skills among school children

Aerobic dance is a type of therapy that uses body movement accompanied by music that has an effective effect on the development of the body from the social, cognitive, and physical aspects of an individual (Choudhary et.al., 2020). The findings of the literature review prove

the effectiveness of aerobic dance on various aspects such as physical, emotional, and cognitive function. The findings of the study *Effects of a Specially Designed Aerobic Dance Routine on Mild Cognitive Impairment (MCI)* by Zhu et. al (2018) proved that a special aerobic dance routine improves cognitive function in episodic aspects and memory processing speed among MCI patients. In this study, MCI refers to the deterioration of mild cognitive function which is also known as the transitional stage of normal aging and the risk of dementia. The results of this study are in line with the study *The Effects of Aerobic Dance Intervention on Brain Spontaneous Activity in Older Adults with Mild Cognitive Impairment: A resting-state functional MRI study* (Qi et. al., 2019) a special aerobic dance routine with moderate intensity improves function cognitive (spontaneous brain reaction) study sample that is elderly adults who face the problem of mild cognitive impairment.

Aerobic Dance is one of the forms of physical exercise that can have a positive impact on the development of several components of physical fitness and body function. Research conducted by Zinelabidine et al (2021) shows that 8 weeks of aerobic dance programs promote executive function (inhibition, working memory and cognitive skills) among primary school children. On the other hand, a study conducted by Kim et.al (2011) proved that 6 months of aerobic dance training has a positive impact on the cognitive function of elderly patients with cognitive impairment. Therefore, the researchers developed an aerobic dance teaching module called the ADa Module and further examined the impact of the use of ADa module on the cognitive development of students with learning disabilities in the Integration Special Education Programme at Secondary School, Putrajaya, Malaysia. Students of this category are selected as a sample of the study because apart from their cognitive characteristics, these students also have an existing experience of aerobic dance through the topic of rhythmic movement in physical education.

Description of The Study

This study examines the development and effectiveness of the *ADa* module with the following objectives:

- i. Is there a need to develop a teaching and learning aerobic dance (ADa) module for students with learning disabilities in the integration special education programme at secondary school Putrajaya, Malaysia.
- ii. Identify the validity of the content aerobic dance (ADa) module for students with learning disabilities in the integration special education programme at secondary school Putrajaya, Malaysia.
- iii. Identify the reliability of the content aerobic dance (ADa) module for students with learning disabilities in the integration special education programme at secondary school Putrajaya, Malaysia.
- iv. Identify the effectiveness aerobic dance (ADa) module towards cognitive development of students with learning disabilities in the integration special education programme at secondary school Putrajaya, Malaysia.

There are several research questions that have been listed, namely

- i. Is there a need to develop a teaching and learning aerobic dance (ADa) module for students with learning disabilities in the integration special education programme at secondary school Putrajaya, Malaysia?

- ii. What is the validity value of the content aerobic dance (ADa) module for students with learning disabilities in the integration special education programme at secondary school Putrajaya, Malaysia?
- iii. What is the reliability value of the content aerobic dance (ADa) module for students with learning disabilities in the integration special education programme at secondary school Putrajaya, Malaysia?
- iv. What is the effectiveness aerobic dance (ADa) module towards cognitive development of students with learning disabilities in the integration special education programme at secondary school Putrajaya, Malaysia?

The ADDIE model is one of the examples of models that are often used to develop a module. ADDIE is an acronym that refers to five phases which are Analysis, Design, Development, Implementation and Evaluation (Rosset, 1987; Shahril M. I, 2016). ADDIE model is the basis for the development of ADa module. According to Ummu Nasibah et.al, (2015) this model is the best model as a basis for building a module because it consists of organized and systematic phases.

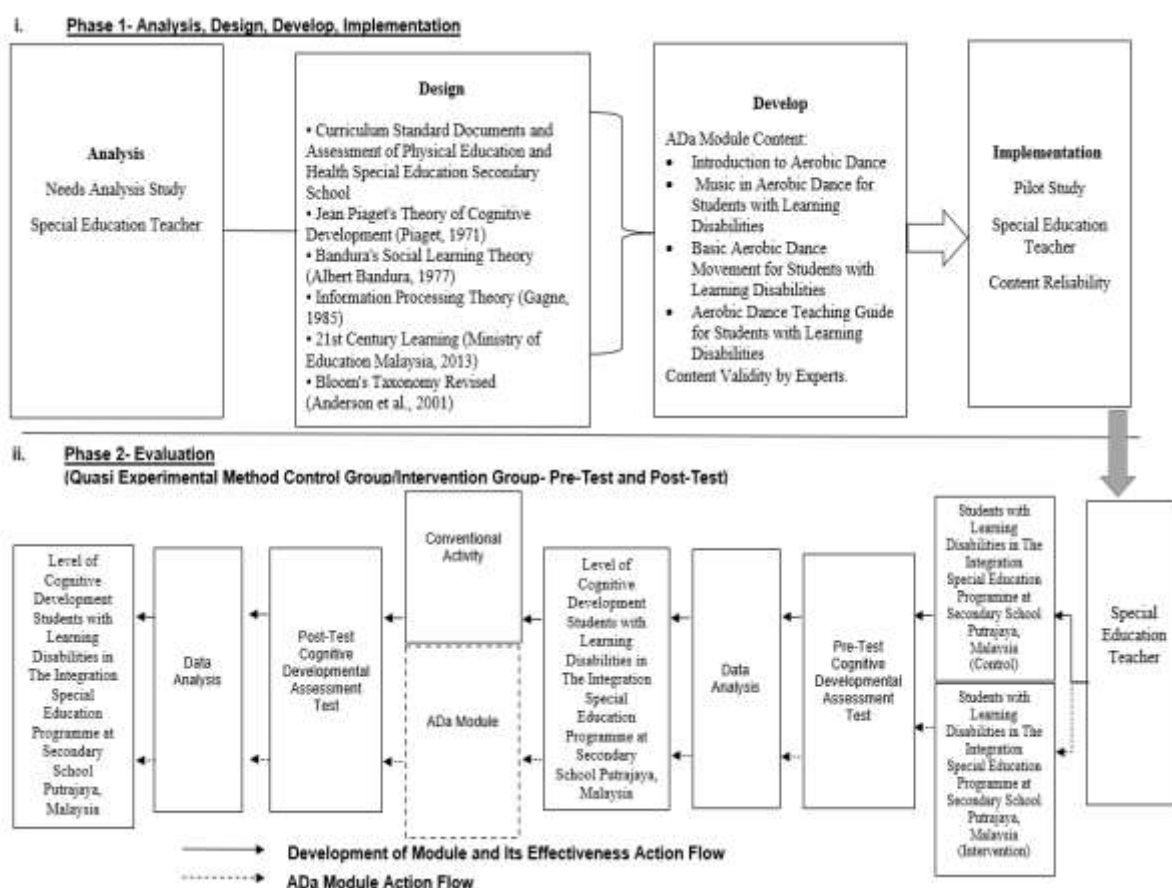


Diagram 1: Conceptual Framework.

This study is quantitative by using a survey approach, validity, and reliability of the module as well as evaluation its effectiveness through quasi-experimental methods. There are two main phases which are phase 1 (analysis, design, develop, implementation) and phase 2 to evaluate the effectiveness.

Phase 1: The phase 1 involves the analysis and research of the literature review, teaching problems and requirements for the development of the module, the content of the module as well as the evaluation of the validity and reliability of the module.

Phase 2: The effectiveness phase of the module involves a quasi-experimental research approach to assess the level cognitive development after following an aerobic dance training session guided by the ADa module.

The quasi-experimental method aims to evaluate the level of cognitive development among students with learning disabilities after following aerobic dance training using the ADa module. The chosen quasi-experimental study design is based on control group design involving a pre-test and a post-test. Two groups are divided into intervention group that will be used as an experimental group that will be given aerobic dance training using the ADa module and the second group is a control group that will not undergo aerobic dance training using the ADa module. Both the treatment group and the control group is assessed in the pre-test and post-test using the same assessment instrument.

Population and Sample

In this study, the researcher used purposive sampling to select the sample based on research knowledge and the specific purpose of the study (Idris, 2010). Those involved have been identified and are a group of respondents that represent the population to be studied (Richey & Klein, 2007). The samples in needs analysis study involved special education teachers who have the same experience and background as the actual study sample. The sample size is determined based on the sample size determination table of (Krejcie & Morgan, 1970). In the second phase of the study, the sample is a group panel of experts who specialize in their respective fields. The experts are in the field of special education, learning disabilities and aerobic dance. A total of 10 experts were selected and agreed to be part of the panel for the content validity of the ADa module. The number is sufficient based on Lynn (1986) stated that the number of experts for content validity is between 3 and 10 people. In this phase as well, purposive sampling was chosen to conduct a pilot study to obtain the reliability value of the ADa module. The sample characteristics of this study are teachers who teach learning disabilities students in The Integration Special Education Program at secondary schools Putrajaya, Malaysia. Sample size is based on Krejcie and Morgan's (1970) sample size determination table. In phase 2, the sample is based on two main criteria, namely students with learning disabilities studying in the Integration Special Education Programme at secondary school Putrajaya, Malaysia. According to Gay and Deihl (1992), the sample size for experimental studies is a minimum of 30 people per group. Therefore, the researcher has determined the sample size of $n=60$ people which is 30 people (intervention group) and 30 people (control group).

Study Requirement

This module's analysis, design and development stage must be completed with the approval of experts. Building the module structure will take six months to complete. Pilot study which is to determine the content reliability will be conducted in 4 weeks. Phase 2 required 12 weeks to complete the quasi-experimental research.

Conclusion

The World Health Organization (WHO, 2020) defines physical activity as any body movement produced by skeletal muscles that requires the use of energy. Regular physical activity can help prevent non-communicable diseases such as heart disease, stroke, diabetes, and some types of cancer. It also helps prevent hypertension, maintain a healthy weight, and can improve mental health, quality and well-being of life. In addition to the benefits to physical health, exercise improves psychological well-being especially for those with learning difficulties such as reducing anxiety, improving self-esteem and mood (Mc Kenzie et.al., 2018). Recently, although there are many methods and treatments to help students with learning disabilities in Malaysia, there is not much focusing systematic physical activity as the main tool in developing their cognitive development.

Contribution

Previously, in Malaysia, the role of aerobic dance as one of the learning modules was underestimated by various parties. On the other hand, research conducted by Zollinger et.al (2017) proves that aerobic dance training for 20 minutes can increase students' energy and thus improve their ability in academics. So, this study is conducted to prove that aerobic dance training is an interesting and interactive learning method that can help to improve the cognitive development of students with learning disabilities. The findings of this study will directly benefit students with learning disabilities and help them improve their cognitive development through aerobic dance activities. In addition, the results of this research will guide teachers to build a special module in the form of physical exercise therapy that can provide fun and intrinsic motivation to students with learning disabilities.

This study will provide inputs that show the uniqueness of teaching and learning of special education teachers to students with learning disabilities. In the future, it can also be used as additional support and reference material for the variety of physical activities in teaching and learning, especially for the cognitive development of students with learning disabilities at school. The findings of this study are important because they can develop a learning module based on physical activity that is more interactive and interesting by using aerobic dance as one of the mediums in diverse learning and teaching activities.

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