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Submission date: 25-Jun-2024 06:28PM (UTC+0900)

Submission ID: 2408380947

File name: 26._RIELS_Journal_doc_Discipulo_2_turnitin.docx (60.75K)

Word count: 4808

Character count: 29250

Science Teacher Competence and Implementation of Authentic Learning Approach in Online Learning Modality and Student Academic Performance in Science

DOI: <https://doi.org/10.47175/rielsj.v1ix.xx>

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ABSTRACT

The science curriculum is designed to be learner-centered, constructivist, and inquiry-based, using evidence to build explanations. This study aimed to investigate the competence level of teachers in the implementation of an authentic learning approach. It employed a quantitative descriptive correlational design using an online survey among grade 10 junior high school science teachers and students from seven (7) private schools in Butuan City during the academic year 2021-2022. Results consistently indicated high teaching competence among science teachers in most schools; however, certain indicators such as gamification, Phet simulations, and conducting small-scale research still need to be implemented in some schools. Significant differences in competence and implementation of authentic learning approach were noted based on schools, attributed factors such as the use of learning management system, resource availability, and online training for teachers. Moreover, a significant relationship was found between the competence of teachers and the implementation of an authentic learning approach. The study also found a commendable level of proficiency in the academic performance of students. However, no significant relationship was observed between teacher competence and the implementation of an authentic learning approach to students' academic performance. These findings suggested that students cultivated a sense of independence in their learning process. It emphasized that empowering students to take ownership of their learning journey and leveraging teachers' expertise as facilitators lays the foundation for enhanced academic success in science education.

KEYWORDS

Teacher Competence, Authentic Learning Approach, Online Learning Modality, Student Academic Performance

INTRODUCTION

The K-12 Science curriculum is learner-centered, constructivist, and inquiry-based, emphasizing facts and evidence in constructing explanations. Science curriculum must represent the real world to make scientific ideas more accessible and engaging. One approach that is said to be effective for students' success is the Authentic Learning Approach. According to Yeen-Ju et al. (2015) and Redmond et al. (2018), this approach connects students to real-life situations and encourages higher-order thinking skills development.

Recently, the COVID-19 pandemic compelled teachers to exhibit greater ingenuity, creativity, and resourcefulness to sustain the learners' engagement. As highlighted by Darby and Liang (2019), the challenge of teaching science subjects online is how to ensure that the students can comprehend the lessons, concepts, and terms to be used in everyday living. Chulkov et al. (2015), quoted by Ancho & Serbo (2019), stated that when teachers fail to connect the lesson to the outside world, some students may struggle to connect with reality. The shift to online delivery presented challenges to educators in the Philippines. This included having to redesign lessons and assessments, the limitations on technological resources, and the decreased social interactions among teachers and learners. DepEd Order No. 42, series of 2016, provided guidelines for lesson preparation, which emphasized the importance of aligning lessons with real-life experiences and promoting inquiry-based and learner-centered approaches. This aligns with the need for authentic learning experiences during online classes. Additionally, the implementation of online learning during the COVID-19 pandemic was guided by DepEd Order No. 12, s. 2020. This outlined the adoption of the Basic Education Learning Continuity Plan and acknowledged the challenges faced by teachers, students, and parents in adapting to the new learning modalities.

In addition, Geverola et al. (2022) reveal in their study about science teachers' experience during the new normal in the Philippines that despite the efforts of the administrators and teachers to continue student learning, science teachers still struggle to develop an engaging academic discussion in online learning. It is known that a significant number of students have limited to no access to gadgets and internet connections to facilitate online learning. Moreover, the students find difficulty in following the schedule of online classes. In turn, this affected the delivery of the lessons and student learning.

Additionally, in the study of Martinez-Alcala et al. (2021), it was found that the pandemic necessitated teachers in the Philippines to carry on multiple roles. They were not just teachers and advisers, but they were also counselors, IT practitioners, and content creators of video materials. It is only reasonable that teachers should receive further support in enhancing teaching competence to improve student learning.

Urmann (2016), as quoted by Liu et al. (2022), stated that teachers' competence primarily refers to their self-efficacy and enthusiasm for teaching, which directly controls their professional engagement and teaching activities. A competent teacher could help the students become scientifically literate, which could produce well-informed, active citizens capable of applying their knowledge to make positive impacts in their social, physical, or environmental well-being. Teachers must be assessed for their competence and capabilities to teach science virtually.

The science teachers in private schools of Butuan City expressed the same view that schools experience difficulties in handling student engagement on top of the technological struggles in carrying out virtual classes. The teachers' needs were addressed to meet the basic needs of the students. These fundamental requirements include access to educational online resources, seminars, training, and other administrative support that may enhance their competence to teach online science classes.

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