The Validity of Inquiry-Based Learning Tools on Students' Scientific Argumentation Ability

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Sections Info

ABSTRACT

Objective: This study aims to describe the validity of inquiry-based learning tools on students' scientific argumenta abilities. The validity of the developed device is viewed from the aspects of content, language and presentation. This type of research is pre-experiment without a control group. **Method:** The method used is the 4D model (define, design, and development) which is modified and implemented in the Postgraduate Program in Science Education, State University of Surabaya. The data collection technique was carried out using the learning device validation method. The assessment instrument uses a device validation sheet. The tools developed are in the form of lesson plans, BAPD, LKPD and students' scientific argumentation ability tests. The validity of this inquiry-based learning tool was assessed by three biology lecturers. Data analysis was carried out quantitatively and the Aiken validity index and its reliability were calculated. **Results:** The validation results obtained the validity index Aikens RPP 0.97, BAPD 0.93, LKPD 0.99, and scientific argumentation test 1.00 with high validity and reliability categories. **Novelty:** the researcher considers that not many previous studies have conducted research on the material of the Human Respiratory System, especially in class XI MIPA based on guided inquiry which includes five indicators of scientific argument, namely claims, ground used, warrants given, counterarguments generated and rebuttal offered. However, the focus of this research is the validation analysis of inquiry-based learning tools on high school students' scientific argumentation abilities.

INTRODUCTION

This 21st century learning era requires a student to have independence in learning and develop the ability to adapt to the era (Septikasari, 2018). The demands of the curriculum in the 21st century are that the learning process must be student-centered. According to Septikasari (2018) the challenge in learning science in the 21st century is the development of 4C. The 4C term referred to includes communication, collaboration, critical thinking and problem solving, and creativity and innovation (Septikasari, 2018). In line with Putri (2021), the skills expected in the 21st century are critical thinking skills, problem solving, collaboration, contextual learning, media and information technology literacy and argumentation skills. Based on this statement, it shows that scientific argumentation skills are important to train students. Through scientific argumentation skills, students will be able to communicate, think critically, establish collaborations while demonstrating creativity and students will be able to analyze scientific problems according to facts and evidence.

According to Grooms (2020) scientific argumentation is the process of stating scientific findings based on evidence. Scientific argumentation is an important activity in submitting ideas based on harmony between claims, data, evidence , and theory. This is supported by Wikara (2022) that in real life, argumentation skills are deemed necessary to solve many life challenges, for example educational, social, economic, or political activities require argumentation skills. Therefore, the implementation of

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