

Application of Non-Cognitive Diagnostic E-Assessment (NCDEA) for Junior High School

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Abstract. This study aims to determine the application of non-cognitive diagnostic E-Assessments (NCDEA) to State Junior High School students in Tampan District, Pekanbaru City, Riau-Indonesia Province. This research is descriptive research using the survey method. The sample used was 100 people who came from 8 public junior high schools in Tampan District, Pekanbaru City, Riau-Indonesia Province. Sampling used cluster random sampling. Data were obtained from the distribution of non-cognitive diagnostic tests. Data analysis was carried out quantitatively and qualitatively. The results of the study explain that the learning styles of junior high school students in Tampan District, Pekanbaru City, Riau-Indonesia Province, consist of 21% audio, 47% visual, and 26% kinaesthetic. Overall learning motivation consists of 64% high, 34% moderate, and 2% low. The preferred forms of learning are 53% offline, 30% online, and 17% blended. The high visual learning style is due to the dominance of student activities in using gadgets, so they are very happy when learning using interactive electronic media. It was concluded that teachers should use interactive electronic media to accommodate offline, online, or blended student learning.

1 Introduction

Indonesia is the fourth largest country in the world in terms of population, where the total population is around 245 million people. This large population contains more than 200 ethnic groups and 300 different languages/dialects. Given the diverse demographic patterns of the population, it is not surprising that there are large socio-economic disparities and income inequalities across the country, which in turn are closely linked to varying student academic achievement [1]. Based on research conducted by the Program for International Student Assessment (PISA), Indonesian students' academic achievement in science and mathematics is lower than that of ASEAN countries such as Malaysia, Vietnam, Thailand, and the Philippines [1–3]. The low achievement of Indonesian students will contribute to the competitiveness of Indonesian education in the future.

The achievement scores of Indonesian students in the fields of science and mathematics are currently ranked 62 and 63 out of a total of 70 countries evaluated by PISA in 2015.

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However, learning science in Indonesia (0.65) has a higher pleasure index than Singapore (0.59) and Japan (-0.33). PISA explains that countries that have high learning achievement in science and mathematics do not always have a high pleasure index in learning science and mathematics as well [3]. Based on the positive indicator of the pleasure index of Indonesian students in studying science, this can be an incentive to increase their mastery of science and mathematics materials. In the attempt to find out the factors that contribute to the low achievement of Indonesian students, it is necessary to carry out a non-cognitive diagnostic assessment.

Research on assessments related to non-cognitive skills in Indonesia is still very limited. This is due to the unavailability of models and instruments for measuring non-cognitive skills that have been developed or adapted for Indonesian students. The unavailability of these two things is the main gap faced by policymakers to be able to identify and get an overview of the non-cognitive skills of students in Indonesia [4].

The currently available non-cognitive skills measurement instruments are more partial and are indicated not to match the characteristics of students in Indonesia. The instrument does not include learning styles, learning motivation, and interest in learning. These three aspects are in direct contact with students in the learning process. Furthermore, a new measurement model will be used to describe the non-cognitive Indonesian students. Why focuses on the four non-cognitive aspects? Though Indonesian students need to master the essence of each field of knowledge being studied, students are also required to know about the direction of the development of science and how science is related to other sciences [5]. Students are also able to study on their own and explore their knowledge [6].

Learning styles are grouped into three categories: visual learning styles, auditory learning styles, and kinesthetic learning styles [7]. Several studies have comprehensively reported on learning style diagnostic assessment instruments [8,9].

Learning motivation is associated with internal and external encouragement in students learning to conduct behavior and is supported by indicators such as a desire and want to succeed, encouragement and need in learning, hopes and aspirations for the future, appreciation in learning, and a conducive learning environment [10]. Learning motivation functions as a driving force for actions, driving actions, and directing actions [11]. In addition, the factors that greatly affect student learning motivation are teachers, parents and outsiders, society, and the environment. In general, learning motivation is able to increase the quality of learning and is implemented in junior high schools [12].

Interest in learning is a form of activeness of a person who encourages to carry out a series of mental and physical activities to obtain a change in behavior obtained from individual experience in interacting with the environment in cognitive, affective, and psychomotor [13]. Interest in learning serves as 1) a source of motivation to learn, 2) assistance in shaping the intensity of appreciation, and 3) an added excitement to the activities occupied [14]. Interest in learning can improve the learning process [15].

Based on the explanation above, the researchers conducted a study that aims to determine the application of non-cognitive diagnostic E-Assessment in State Junior High School students in Tampan District, Pekanbaru City, Riau-Indonesia Province, in 2022.

2 Methods

This research is descriptive research using the survey method. The survey method is a way to collect data from certain natural (as opposed to artificial) locations, but researchers also use other methods to treat the data they get, such as giving out questionnaires, tests, structured interviews, and so on. The survey method obtains a sample from a population and uses a questionnaire as the main data collection tool [16]. The sample used was 100 people who

came from 8 public junior high schools in Tampan District, Pekanbaru City, Riau-Indonesia Province. Sampling used cluster random sampling.

3 Results and Discussion

The results of the study suggest that the learning styles of junior high school students in Tampan District, Pekanbaru City, Riau-Indonesia Province, consist of 21% audio, 47% visual, and 26% kinesthetic. This learning style variation serves as important data for a teacher in preparing the learning process.

Different strokes for different folks. Different learning styles for different people. The proverb is appropriate to explain that not all individuals have the same learning style; it is certain that each individual has a dominant one—even if they are in the same neighborhood, the same school, or even in the same class. Learning style is a combination of the way a person absorbs, organizes, and processes information [7].

The high visual learning style is caused by many factors, and one of them is the changing times that lead to children's habits in activities. Visual learning style encompasses learning by seeing; hence the eyes play an important role. Visual learning style is done by someone to obtain information, such as looking at pictures, diagrams, maps, posters, graphics, and so on. You can also look at text data such as writing and letters [17]. Visual learners (those who learn visually) place a greater emphasis on vision. Visual learning methods access both created and recalled visual perspectives. Drawings and sketches, as well as portraits, colors, and spatial relationships, are more prevalent in this kind of learning approach. The traits of students who are visual types include being neat and focused, speaking appropriately, being a strong designer and manager, being observant, thorough, and detailed, being an avid reader, and frequently responding to questions with short, yes, or no answers. They also prefer reading to being read to, prefer doing presentations/shows over just lecturing, and prefer art [7].

The results of further research explained that learning motivation consisted of 64% high, 34% moderate, and 2% low. Motivation is an effort to enlarge or hold a movement to achieve certain goals [18]. Another way to think of motivation is as a set of actions taken to create the conditions necessary for someone to want and enjoy doing something. If they don't, they will work to eliminate or avoid their hate of it. As a result, while motivation might be sparked by outside factors, it ultimately comes from within an individual. In terms of learning activities, motivation can be defined as the general force that propels students to engage in learning, ensures that learning activities continue, and gives learning activities direction so that the learning subject's desired outcomes can be realized [11]. Students with a lack of motivation are strongly influenced by external factors such as learning environment, study time, and instrumental support, which ultimately affect achievement [19]. The selection of the form of learning must be in accordance with the child's learning style.

The forms of learning that students are interested in are 53% offline, 30% online, and 17% blended. Interest is a sense of liking and sense of interest in a thing or activity without anyone telling. A great interest in something is a big capital to achieve the desired goal. Great interest in learning tends to produce high achievement, and, on the contrary, less interest in learning will result in low achievement [20]. The children's high interest in taking part in offline learning is because they want to socialize and play together with their friends. In addition, learning that is only done at home without gathering causes boredom.

The dominance of visual learning styles, high motivation to learn, and students' tendency to want offline learning indicate that teachers must be able to vary their learning strategies. Learning styles are correlated with learning strategies [21]. The learning design must be in accordance with 21st-century learning. Incorporating digitization and gamification is very

helpful for teachers in achieving learning objectives. One form of learning strategy that accommodates students' learning needs is the use of worksheets.

Teachers should prepare three worksheets that accommodate three types of learning styles, but that does not mean that one learning style does not accommodate other learning styles. When a teacher has carried out learning based on the needs of children's learning styles, the teacher has indirectly implemented differentiated learning. In his book Pusara, Ki Hajar Dewantara stated that it is not good to make uniform things that are not necessary or cannot be made uniform and should be facilitated wisely. However, Ki Hajar Dewantara's references to this study are limited. Teachers' creativity is needed to be able to accommodate this in order to provide meaningful learning for each student to achieve the competencies to be targeted.

4 Conclusion

The learning styles of State Junior High School students in Tampan District, Pekanbaru City, Riau-Indonesia Province consist of 21% audio, 47% visual, and 26% kinesthetic. Learning motivation consists of 64% high, 34% moderate, and 2% low. The preferred forms of learning are 53% offline, 30% online, and 17% blended. The high visual learning style is due to the dominance of student activities in using gadgets, so they are very happy when learning using interactive electronic media. Teachers should use interactive electronic media to accommodate offline, online, or blended student learning.

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