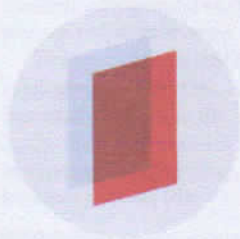


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## Relationship between students' multiple intelligence-based instructional areas and assessment on academic achievements

To cite this article: L Nulhakim *et al* 2019 *J. Phys.: Conf. Ser.* **1188** 012086

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## Relationship between students' multiple intelligence-based instructional areas and assessment on academic achievements

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**Abstract.** The aim of this research is to investigation of the relationship between students' multiple intelligence based instructional (MIBI) areas and their assessment academic achievements the grade point averages of their students in Indonesia, mathematics, science and technology and social class. The research sample contains of 71 classroom Students' who worked in primary schools in the Banten Province during the 2016-2017 academic year. The research method used is the evaluation method based on Stake model by using qualitative research. In the research, uses techniques using observation data, interviews, questionnaires and study documentation. In the analysis of the data obtained from this study, Descriptive Statistics, Independent Sample t-test and Pearson Product Moment Correlation Coefficient were used. The findings of the study, suggest that there was no statistically significant difference between the classroom Students' average scores of verbal-linguistic, visual-spatial, naturalistic, musical, logical-mathematical, intrapersonal, interpersonal and bodily-kinaesthetic intelligence areas in terms of the "gender" and "grade level" variables. The result stage is a very good learning outcome with assessment academic achievements that include cognitive, affective and psychomotor.

### 1. Introduction

The implementation of good education is a difficult challenge for educators because through good education can produce future generations of quality. 21st century education is more oriented to the development of human potential, not only focusing on technical abilities solely in exploiting, but oriented to the ability of students. In the 21st century learning students must have the ability to solve problems, think critically, find and evaluate an information and can productively collaborate and communicate with other students [1].

Learning is a dynamic process, one learns various things throughout his life. A new learning experience can add capacity and insight to do new things, besides that it will have a new meaning in life as a result of the learning process. Good learning is learning that makes every student has cognitive, affective and psychomotor abilities. One of the challenges in the education world lies in how to make students accustomed to critical and creative thinking in solving problems, thus educators are required to play an active role in the learning process [2].

The process of learning in schools generally emphasizes uniformity and measures students' cognitive intelligence. Activities to explore and measure intelligence more complex are rarely done in schools, especially exploring the interests, talents, skills and talents that students have not become the main focus in the learning process [3]. Every student has different intelligence, intelligence can be understood by observing his behaviour, such as his ability to understand an object, collecting data, memorizing and learning process [4].



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Good learning is an activity that can be done psychologically and physiologically. Psychological activities can be in the form of thinking, understanding, concluding listening, analysing, and analysing [5]. Through the learning process can make every student become a human who has the potential or intelligence. In addition, good learning is learning that can develop a variety of potential and intelligence contained in students.

School as a place of learning is an ideal place for the development of potential students, should play a role in the development of intelligence possessed by students. Intelligence is a person's ability to respect themselves and others, understand people's feelings, the ability to follow a rule that applies, and the ability to communicate with people around [6]. Intelligence is an important aspect of learning that can support student success in learning. Intelligence is not only the ability of students in answering questions or obtaining high grades, but the abilities possessed by students in seeing and solving a problem faced both in the school environment and in their daily lives.

Each student has a different learning style or learning style. Therefore, the classical system is considered not in accordance with the concept of individual differences, the classical system considers that between students with one another in the class or also called homogeneous. This is certainly not in line with current learning, because good and effective learning if the teacher can pay attention to the differences that exist in each individual. This is in line with the idea that every child is born with a good or smart condition, has potential, and has their own uniqueness that allows one to be the best.

Schools in general only respect each intelligence or individual characteristics. Even though everyone has a unique way to solve the problems they face. Intelligence is not only seen from the value obtained by a person, intelligence is the ability possessed by someone to see a problem, then solve the problem or make something that can be useful for others.

The use of multiple intelligences in learning must still pay attention to the level of development of students, so that schools and teachers can fulfil all facilities for the sake of honing multiple intelligences in accordance with learning styles proportionally so that interaction occurs in the learning process. To support multiple intelligence-based learning, an intelligent learning environment is needed, which is a learning environment that prioritizes student experience in learning and student interaction with the environment or the surrounding environment so that students can foster a sense of care for the environment. Students can develop their potential and concern for the environment, learn about natural phenomena, and be able to understand and solve problems they encounter in the surrounding world [7]. However, investigation of the relationship between students' multiple intelligence based instructional areas not not much developed, the renewal of the results of this study examines students' multiple intelligence based instructional (MIBI) academic achievements assessment. Based on the above background, it is necessary to develop a research about the purpose of this research relationship between students' academic multiple areas and their academic assessment of the grade point averages of their students in Indonesia, mathematics, science and technology and social class.

## 2. Multiple Intelligences

Intelligence is a term that is difficult to define and gives rise to different understandings among scientists. Popular understanding of intelligence is often defined as a general mental ability to learn and apply knowledge in manipulating the environment, as well as the ability to think abstractly. Some other scientists argue that intelligence is a mental adaptation to new circumstances [8]. Measurement of intelligence on analytical abilities is measured by providing clear information needed in solving problems and only one correct answer is obtained from the correct problem solving method. This answer is obtained from the experience and knowledge possessed by individuals. Classical psychometric view, intelligence is defined operationally as the ability to answer items on an intelligence test. The conclusion of the test score for an ability is supported by statistical techniques. These techniques compare the responses of subjects at different ages, the real correlation of these test scores at age and different test tests confirm the understanding that general intelligence, which is shortly called *g*, does not change much as you age, exercise, or experience, it is an innate nature or individual talent [9].

Multiple intelligences are defined as various skills and talents of students to solve various problems in learning. Multiple intelligence theories emphasize the variety of ways people show their talents in intelligence and between intelligence. Multiple intelligence was first introduced by Gardner in his book

entitled *Frame of Mind: The Theory of Multiple Intelligences*. The theory was developed based on Gardner's belief that intelligence is not only determined by one factor, but from a number of factors. In 1985 Gardner explained in his book seven types of intelligence, namely: (1) spatial-space (visio-spatial), (2) linguistic (linguistics), (3) interpersonal, (4) music (music), (5) physical-kinesthetic (bodily-kinesthesis), (6) interpersonal and (7) logical-mathematical (logical-mathematical). But in the subsequent development of the seven types of intelligence, because the social and cultural development of society is divided into eight intelligences and then nine intelligences, namely (8) naturalist, and (9) existential / spiritual [10].

The theory of multiple intelligences developed by Howard Gardener, that human intelligence is not only limited to one type of intelligence, but also to various intelligences possessed by humans. Gardener's multiple intelligence theory is divided into seven intelligences: (1) Linguistic intelligence is intelligence in using language which includes the ability to express opinions and thoughts in verbal and written form. (2) Music intelligence is intelligence in understanding sounds, sounds, rhythms derived from musical instruments and the ability to understand tones in humming or singing. (3) Mathematical logical intelligence is intelligence related to understanding patterns, numbers and symbols. (4) Spatial intelligence is the ability to understand multiple forms, images and space. (5) Kinesthetic intelligence is intelligence related to physical activity related to touch, movement, and body balance. (6) Personal intelligence is intelligence that deals with human social interaction both in understanding themselves and understanding others [9].

### 3. Assessment Academic Achievements

Academic self-concept is an evaluative self-perception that is formed through the student's experience and interpretation of the school environment. Determining the direction of the relation between academic self-concept and academic achievement has been a critical issue in this field of research [11]. Research has contrasted the self enhancement and skill development models. According to the self-enhancement model, self-concept is a determinant of academic achievement, whereas the skill development model proposes that academic self-concept is a consequence of academic achievement. In past research, these models were tested using the magnitude of cross-lagged relations to determine the potential causal predominance between the two variables. In other words, effect sizes of prior achievement on subsequent self-concept (in support of skill development models) were compared with effect sizes of prior self-concept on subsequent achievement (in support of self-enhancement models) [12].

The effects to support either model is inadequate. A more realistic compromise between the self-enhancement and skill development models would be a reciprocal-effects model, whereby prior self-concept predicts subsequent achievement and prior achievement predicts subsequent self-concept. The despite some methodological limitations and heterogeneity in terms of design, age, and sample, the research consistently supported a reciprocal relation between these variables. In addition, past research has shown that the reciprocal relation between these constructs is observed with a general measure of academic self-concept as well as with one that is specific to a given school subject. Thus, global or specific academic self-concept would contribute to academic achievement, which would in turn enhance academic self-concept, and so on [13].

In examining these reciprocal relations, we wondered whether other variables were involved. We propose that motivation is the process that explains how academic self-concept contributes to achievement, which is consistent with expectancy-value theory, self-concept theory, and self-determination theory [12, 13]. However, few studies have examined the mediating role of academic motivation in the relation between academic self-concept and achievement. The goal of the present study was to test this mediating effect from a self-determination perspective of academic motivation.

### 4. Method

The research method used is evaluative study which aims to see of Multiple Intelligence Based Instructional (MIBI) in primary science education. The method of evaluation of the program to be used in research is the method developed by Stake (Stake, 2004). According to Creswell, there are several characteristics that exist in qualitative research, namely: understanding the problems to be evaluated,

the material to be evaluated, data collection, data analysis and report writing. In addition qualitative research is a research that makes facts easy to understand and generate new hypotheses or theories. The research design model used is Stake model.

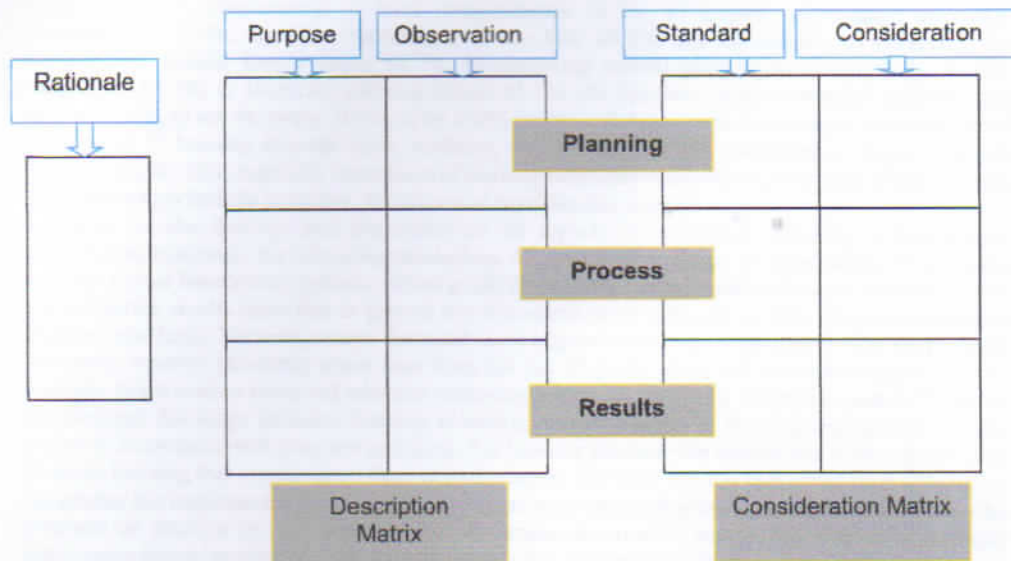


Figure 1. Evaluation of the program of Stake model

Based on Figure 1, the model is a responsive evaluation model that has three stages: planning (antecedents), processes (transactions), and outcomes. The collect data and to measure the differences in the students' knowledge levels before and after the study depending on the methods used. The antecedents, processes (transactions), and outcomes.

### 5. Results and Discussion

Evaluation in this research focus on to exploring of Multiple Intelligence Based Instructional (MIBI) in primary science education in Cilegon City. The results of this research evaluation will be presented in several stages according to the Stake evaluation model consisting of antecedents, transactions, and outcomes. The evaluation in this study focused on evaluating multiple intelligence-based learning programs in the primary school of Cilegon City Civilization. The results of this research evaluation will be presented in several stages in accordance with the Stake evaluation model consisting of antecedents, transactions, and outcomes. The results of the study show the antecedents stages include: formal foundation, students, school goals, curriculum, infrastructure, educators, it turns out that the evaluation results indicate that in general antecedent stage components have shown according to program standards. The components that need to be improved are not in accordance with the program standards, namely: laboratory space seen from the use of space, tools, and materials needed. For the statistics board teacher room and educator competencies which need to be improved again. Transaction stages include: learning planning, implementation of learning and assessment, has shown in accordance with program standards. For learning planning the teacher has made a lesson plan in every learning that encourages effective and efficient learning. Based on descriptive statistics for the implementation of teacher learning already using multiple intelligence-based learning. There are nine multiple intelligences that have been observed as follows: (1) linguistics: a) listening to the teacher's explanation 100%, b) speaking and expressing opinions 50%, c) reading books and literature 71.4%. (2) Mathematical logic: a) asking questions 50%, b) numeracy and using 78.6%, c) completing and doing 50% questions. (3) Visual spatial: a) sort the image according to the instructions 71.4%, b) draw 28.6%, c) make a chart 35.7%. (4) kinesthetic: a)

imitating the teacher's movement 42.9%, b) making crafts 14.3%, c) moving, moving places or mobility 71.4%. (5) Musicals: a) singing or humming 57.1%, b) listening to music 57.1%, c) clapping 71.4%. (6) interpersonal: a) doing 100% group work, b) guiding friends in completing 92.9% tasks, c) doing 100% cooperation. (7) intrapersonal: a) work independently 85.7%, b) prepare and manage their own completeness 71.4%, c) show seriousness in the task 64.3%. (8) naturalistic: a) observing the environment around flora / fauna 85.7%, b) observing natural phenomena (earthquakes, floods, landslides) 85.7%, c) observing celestial bodies 85.7%. (9) Spiritual: perform worship (ablution and prayer) 100%, b) say the praise 100%, c) do 100% prayer activities. Assessment stages the existence of assessment of learning through daily, midterm, and end of semester assessments. Stage outcomes include: results. This stage is an assessment of learning outcomes in accordance with educational process standards which include cognitive, affective and psychomotor assessment.

Based on the findings and discussion on all aspects of evaluation covering: i antecedents, transactions, outcomes, the following conclusions can be drawn: 1. Stages of antecedents, These stages include: formal foundation, students, school goals, curriculum, infrastructure, educators, it turns out that the evaluation results show that in general the antecedent stage components have shown according to program standards. The components that need to be improved are not in accordance with the program standards, namely: laboratory space seen from the use of space, tools, and materials needed. For the statistics board teacher room and educator competencies which need to be improved again. 2. Stages of transactions, this stage includes: learning planning, implementation of learning and assessment, has shown in accordance with program standards. For learning planning the teacher has made a lesson plan in every learning that encourages effective and efficient learning. For the implementation of learning the teacher has implemented learning that encourages multiple intelligence learning that can develop the potential of students in each learning. For the implementation of teacher learning using multiple intelligence-based learning. The assessment stage is the assessment of learning through daily, midterm, and end of semester tests. 3. Phase outcomes, this stage includes: results. This stage is an assessment of learning outcomes in accordance with educational process standards which include cognitive, affective and psychomotor assessment.

Based on the results of the Independent Sample t-test, we got data presented in Table 1.

**Table 1.** Results of Independent Sample t-test

	N	Mean	Deviation Standard
Post-test	29	72,4	11,4
Pre-test	29	68,2	11,0

Based on Table 1, we obtained information that the average value of the post-test experimental class is 72.4 with a standard deviation of 11.4, while the average posttest value of the control class is 68.2 with a standard deviation of 11.0. The average results of both classes show that the average experimental class is higher than the control class with a difference of 8.62. From the above results it is found that T-Value with DF = 62 shows a value of 3.04. Based on the T-Test table, T-Value 3.04 has a significance level of 0.005. While from the calculation results obtained the probability value (P-Value) is 0.003 where the value is smaller than the significance level of 0.005. So it can be concluded that the value of experimental class student learning outcomes is better than control class students.

## 6. Conclusion

This study the findings of the study, suggest that there was no statistically significant difference between the classroom Students' average scores of verbal-linguistic, visual-spatial, naturalistic, musical, logical-mathematical, intrapersonal, interpersonal and bodily-kinaesthetic intelligence areas in terms of the "gender" and "grade level" variables. The result stage is a very good learning outcome with assessment academic achievements that include cognitive, affective and psychomotor.

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