

# Influence of Joyful Learning on Elementary School Students' Attitudes Toward Science

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**Abstract.** This study investigated the effects of joyful learning approach on elementary school students' attitudes toward science. The method used is quasi experiment with the participants were divided into two groups. Thirty three of 4th grade students volunteered as an experimental group, and the other forty two as a control group. The data was collected by questionnaire that are given before and after the lesson, observation sheet, and interview. The effect of joyful learning on students' attitude was obtained by determining the n-gain and independent t-test. Observation and interview results were used to triangulate and support the quantitative findings. The data showed that the gain scores of the experimental group students' attitudes toward science were significantly higher than the gain scores of control group. In addition, the experimental group made significantly greater progress in their cognitive, affective and conative experiences. Interviews and observations indicated that their attitude toward science changed over the intervention. This indicated that joyful learning approach can enhance the elementary school students' attitudes toward science. According to these findings, it can be concluded that joyful learning approach can be used as an alternative approach to improve student's attitude toward science.

## 1. Introduction

Activities developed in science teaching should aim to encourage students to observe and explore their environment, to understand the relationships in nature, the relationship between man and nature, and to learn to understand human beings as an integral part of the life chain. So learn science will be able to be more fun, both for students and teachers, if it is based on real experiences [1]. Beside that, in science learning process, both of hear and see are not enough to learn. Students will improved their understood, if they can do something with the information obtained.

The study of attitudes toward science has received attention in recent decades [2] and this is the key in the concept mastery of Science [3]. Positive attitude toward science is constructed with the subject matter being taught, methods and learning media, teacher academic ability and their interpersonal, physical and social environments that support the student enjoyed learning [4]. This is associated with learning positively, memorizing and higher order thinking skills successfully [5],[6],[7]. Attitude is a form of evaluation or feelings toward an object that supports does not support or do not take sides (unfavorable) [8],[9]. It defines as a certain regularity in terms of thinking (cognition), feeling (affection), and predisposition action (conation) a person against an aspect in the surrounding environment [10]. This concept is known as triadic schemes (triadic scheme) the view that attitude as a reaction to a combination of cognitive, affective and behavior of an object. The cognitive, affective,



and conation (behavior) as a stand-alone factor which would then form the concept of attitude, or better known as the tripartite models[11]. The attitude is affective on positive or negative assessment of an object[12]. Based on these opinions can be concluded that the attitude response consists of cognition (a statement of what is believed), affection response (statement of what is perceived) and the response conation (statement regarding the behavior [13]).

Joyful Learning are strategy, concept and practice of synergic learning of meaningful learning [14][15], contextual learning[1],[16],[17], the theory of constructivism [18],[19], active learning [20], and child psychological development [21]. Joyful perception is a positive influence on the motivation of learners[22]. Some of educational games with the Joyful Learning strategy has been developed and is based on the theory and strategy of science education/pedagogic [23]. Joyful strategy Classroom Learning System (JCLS) has been used to help children learning multiplication in math. Based on trial results and field tests show that JCLS provide a deeper understanding of the subject matter through hands-on exercises. Besides that, by using JCLS simultaneously increase students' motivation and improve joyful perception during the learning process. JCLS known also supports teacher each student's ability to obtain information quickly and accurately so as to determine in-class instructional strategy and provide after-school assistances [18]. The implementation of the joyful activity-based learning (ABJL) strategy has been elaborated at several elementary schools in Maharashtra India Jadal [19],[24]. ABJL strategy is a learning strategy maximum student involvement in the learning process. This strategy refers to the principles of learn by playing, learn by doing, learn by enjoying and learn by problem solving. This learning strategy requires the involvement of multiple sensory organs students during the learning process. Based on several studies that use different learning strategies which refers to the joyful learning activities give positive results. The purpose of this study is to examine and analyze the scores increase attitude toward science (cognition, affection and affection)

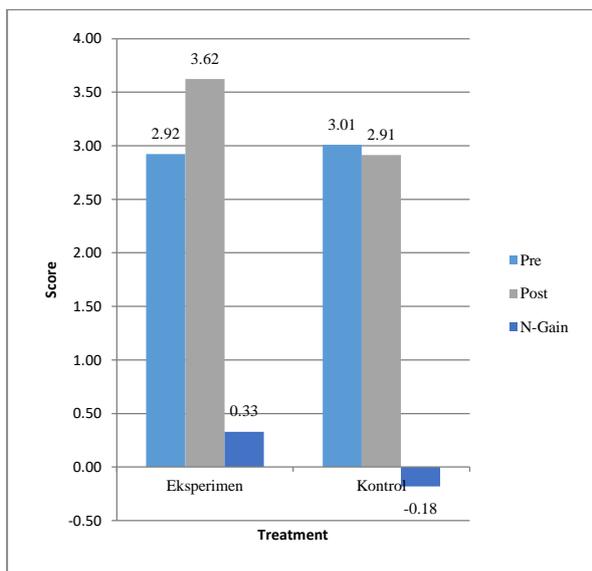
## 2. Research method

This research was conducted by quasy experimental design. The Population of this study are two private elementary school students in Bandung city. The sample are all forth student in these schools. The instrument that used was developed by operational definitions and indicators of the attitude toward science. Attitude toward science is a response to student cognition, affection, and conation to the statements in the questionnaire to accept or reject the science learning which covers the subject matter, learning models, learning media and teacher character shown on the statement contained in the questionnaire attitude of science learning. Cognitive attitudes include students' attitudes toward the usefulness of materials science, the effectivity of learning media and model were used and the ability of teachers to teach. Affective attitude include students' attitudes toward material deemed attractive, media and learning model that is exciting and fun and character of the teacher teaches. While the attitude connative include students' attitudes towards material science, media and inspiring learning models, as well as the enthusiasm of teachers in teaching.

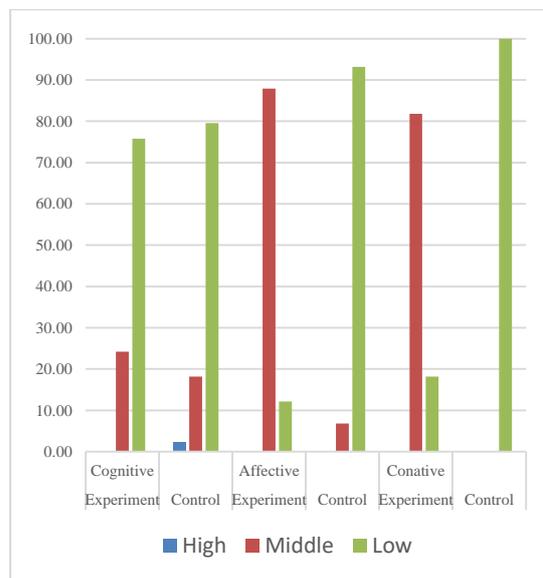
Joyful Learning is learning activities undertaken by the students through role-play activities, experiments, and group discussions conducted inside and outside the classroom. The theme refers to the activities performed science concepts regarding Natural Resources and sounds associated with the object in the field of health (doctors and stethoscope), music (musicians and musical instruments) and forestry (erosion and consequently). The indicators of learning toward science questionnaire are cognitive (11 items), affective (9 items) and conative aspects (9 items). The purpose of this study is to examine and analyze the scores increase attitude toward science on experimental group and the control group. The test is performed to determine differences in attitude scores increase learning and mastery of concepts before and after treatment. The increase that occurred before and after learning the views from the index gain score (N-Gain) with the Meltzer formula [25].

## 3. Results and discussion

Description of attitude toward science scores before and after treatment with N-Gain value is shown in Figure 1 dan Figure 2.



**Figure 1.** The Attitude toward science performance.



**Figure 2.** N-Gain categories of attitude toward science.

Figure 1 has described the attitude toward science scores during the study. It has shown increased in experiment class and decreased in control. By Hake category, a score of N-Gain classified into three categories, namely the increase in the category of high, medium and low [25]. Improved attitude toward science score of experimental group is 0.33 and including medium category [25], whereas the increase in the control group attitude toward science scores of -0.11 including low category. The results has supported that the Joyful Learning gives better results than conventional learning.[4],[17],[19],[26] and also influence on behavior Joyful study or receive information[5],[6],[27],[28].

The number of students in grade experimental and control classes that meet the category of high, medium, and low is shown in Fig. 2. In Figure 2 it appears that the majority of the control class students obtained a score of N-Gain with low category on every aspect of attitude. While the experimental class, most students (over 80%) of students had increased scores on the attitude of learning medium category affective and conative aspects. Based on these results can be drawn a conclusion that the approach Joyful Learning in science learning provides enhanced attitude toward science better than conventional learning. Figure 1 and 2 have shown that are difference in the improvement of attitude toward science score of the second class treatment. These data indicated experiment class was higher than the control.

Based on normality test were using the *Kolmogorov-Smirnov* and *Levene's test* of homogeneity, attitude toward science before and after treatment with *N-Gain* have shown normal distributed and homogen. The results of testing the difference improvement and learning behaviors using *Joyful Learning* strategies are presented in Table 1 and 2.

**Table 1.** Analysis of variance n-gain attitude towards science.

Aspect	Group	Mean	F	Sig.	T	Sig.
Attitude towards science	Experiment	0.338	26.925	0.000	15.057	0.000
	Control	0.187				

**Table 2.** The result analysis of variance of N-Gain aspects of attitude towards science.

Aspects of Attitude toward science	Anova Test Result
Cognitive	(0.20) (-0.09), E (0.025) = 2,026.p < .05
Affective	(0.42) (- 0.04), E (0.042) = - 10,95.p < .05
Conative	(0.37) (- 0.26), E (0.023) = 14,372.p < .05

Table 1 shows Joyful perception has positive influence on the attitude toward science of learners[9],[22]. Educational games with Joyful Learning strategy has been developed and is based on the theory and strategy of science education/pedagogic[23].

Table 2 shows the test results of the differences in attitudes enhancement treatment. All aspects of attitude toward science have influenced with joyful learning significantly. This shows that the joyful learning approach can improve the attitude of learning in cognitive, affective and conative in science learning. Joyful Classroom Learning System Strategy (JCLS) can increase students' motivation and improve joyful perception during the learning process[18]. The strategy joyful activity-based learning (ABJL) at several elementary schools in Maharashtra India gives better results than using *traditional learning methods*[19][24].

Attitude is a certain regularity in terms of knowledge (cognition), comprehension (affection), and behavior (conation) the person against an aspect in the surrounding environment[13]. Joyful Learning shown to provide positive influence on the attitudes of students in learning science. In the experimental group, teachers apply learning activities using the principles of the principles of learning by playing, learning by doing, learning by enjoying and learning by problem solving. Students synergy of activities to make tools and play a role like making a stethoscope and checking the heart rate. At other times the students to make a musical instrument from a bottle filled with water in a certain amount and make the tune of their own choosing. The teacher's role in these activities is as a facilitator and evaluator.

Students were enthusiastic in applying such activities, it has been seen from their willingness to bring their own equipment from home and a strong desire to be able to make props and apply it. The most fundamental thing of the invention Piaget's theory of cognitive development is learning on the students do not have to happen just because a teacher teaches something to him. Piaget believe that learning occurs because the student was actively construct knowledge from it, and this is reinforced when students have control and choice about the things learned [29],[30]. This does not negate the teacher factor in the learning process. Teaching by the teacher who invites students to explore, apply manipulation, either in the form of physical or symbolic, ask questions and seek answers, comparing answers from other students will be helping students to learn and understand something.

At the beginning of the learning, the teacher provides introductory material with learning by play, either using tools like puzzle games and science comic books. Beside that, during the learning process, teachers applying intense interaction in students through interactive discussion. At each lesson, the teacher provides time to apply outdoor activities. Activities carried out with regard to the material presented. It turned out to provide a different atmosphere than when done in the classroom. Students can apply to the activities of groups with a wider space. Students are seen more zeal in applying the learning activities as learning activities can be done while playing. According to Vygotsky through play, all aspects of child development can be improved [31]. With children can play freely express and explore to strengthen the things that are already known and discover new things. Through learning by play, children can also develop all their potential optimally, both physical and mental potential intellectual and spiritual. Therefore, children's play is a bridge to the development of physical and psychological [16].

Learning is a process of knowledge development is holistic and sustained through social interaction, based on experience and students adapt to their lives. Through play, social interaction with peers, teachers and parents can be constructed. Interaction with adults (in this case the teachers at school and parents at home) is very important for cognitive development process more quickly achieved. This is consistent with the view of Vygotsky's Zone of Proximal Development concept [32].

At the end of the lesson, the teacher asked us to apply the evaluation activities through competitive activities. Each group presented the results of discussions by the poster they made together, then the other group to provide an assessment. This makes each group tries to show the best. The implications of the cognitive theory of Vygotsky[31], on science learning that are:(1) desired form of cooperative learning classroom setting so that students can interact around tasks and bring mutual problem-solving strategies affective within the zone of proximal development; and (2) In teaching emphasized scaffolding so that students are increasingly responsible for their own learning.

Joyful Learning is a learning approach that involves a sense of fun, happy, and comfortable of the parties who are in the learning process. There is an attachment of love and affection between teachers and learners and among learners, and the learning process will make each party trying to give the best to please others. Teachers with the passionate spirit will seek optimal lead the class in a way that is most attractive, while participants with enthusiasm and compete actively take part in any activity. Thus, Joyful Learning becomes a means that makes teachers and students to be like a session-by-session lesson so that the result will be a maximum [7],[19],[32],[33],[34]

Joyful Learning is done in the experimental class corresponding to the characteristics proposed by [21][27][28]. The existence of a relaxed environment, fun, does not create tension (stress), safe, attractive, and not make students feel free to apply something wrong to achieve success despite high. Availability of the subject matter and the relevant methods, involvement of all the senses and brain activity left and right, the situation challenging learning (challenging) for students to explore the material being studied, as well as learning situations positive emotional when students learn together, to make learning more fun. Joy of Learning indicators have been conducted on the experimental class [28]. Some indicators include: (a) find the pleasure in learning; (b) let student create things; (c) show off student work; (d) take time to think; (e) make-school spaces inviting; (f) get outside; and (g) read good books. Atmosphere "pleasant discovery" makes students maintain enthusiasm undergo a learning process with joyful feeling [7]. Joyful Learning is done in harmony with the experimental class proposed by [27]. Students feel the atmosphere of learning that arouse interest in learning, relax, and attractive so as to make the student spirit and high concentration during lessons. Full involvement in the learning demonstrated by a willingness to provide their own equipment and the division of tasks within the group independently with joy.

#### 4. Conclusion

Based on observations in the experimental class and control class, it can be concluded that the students get to experience positive cognitive learning through learning materials that are useful, methods and appropriate learning media, as well as a good teacher. If it is supported through the affective experience interesting subject matter, methods and media learning engaging and fun as well as enthusiasm and fun, make students have a positive desire or inclination to science learn (conative experience). Students who have an opinion that science learning beneficial to himself, engaging and fun in the learning process, have a tendency to study harder. In contrast, when learning science is considered as a burden, supported by a learning process that is tedious, causing lazy students to learn science. Therefore, creating joyful learning help students to overcome student's barrier towards science.

#### 5. References

- [1] Hart C, Mulhall P, Berry A, Loughran J, Gunstone R 2000 *J. Res. Sci. Teach* **37** 655-75
- [2] Ali M S and Awan A S 2013 *Interdisciplinary Journal of Contemporary Research In Business* **4** 707-18

- [3] Nordin A and Ling L H 2011 *Journal of Science & Mathematics Educational* **2** 89-101
- [4] Chopra V and Chabra S 2013 *Journal of Unschooling and Alternative Learning* **7** 28-44
- [5] Willis J 2007 The neuroscience of joyful education *Educational Leadership* EL 64(2007)
- [6] Willis J 2011 Understanding how the brain thinks *Brain Based Learning* (Online: Edutopia)
- [7] Kohn A 2004 Feel bad education the cult of rigor and the loss of joy *Feel-Bad Education and Other Contrarian Essays on Children & Schooling Education Week* vol 24 (Boston: Beacon Press) pp 44–45
- [8] Kwon J and Vogt C 2008 *Proc. of the 2008 Northeastern Recreation Research Symp* (New York: USDA Forest Service) pp 298-305
- [9] Kirikkaya E B 2011 *Educational Research and Reviews Academic Journals* **6** 374-82
- [10] Tighezza M 2013 *International Journal of Science and Mathematics Education* **12** 721-40
- [11] Eagly A H and Chaiken S 2007 *Guilford Journals* **25** 582-602
- [12] Fishbein M and Ajzen I 1975 *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research* (MA: Addison-Wesley) p 23
- [13] Azwar 1995 *Sikap Manusia Teori dan Pengukurannya* (Yogyakarta: Pustaka Pelajar) pp 20-45.
- [14] Vallori A B 2002 *Meaningful Learning in Practice: How to Put Meaningful Learning in The Classroom* (Granada: Seminar on Meaningful Learning)
- [15] Morgado P 2010 *Transformative Dialogues: Teaching & Learning Journal* **4** 1-13
- [16] Brotherson S 2009 Young children and the important of play *Bright Beginning* vol 23 (North Dakota State University)
- [17] Hayes D 2007 *Joyful Teaching and Learning in Primary School*, ed Bell & Bain (Glasgow: Great Britain)
- [18] Wei C, Hung I C, Lee L and Chen N 2011 *TOJET: The Turkish Online Journal of Educational Technology* **10**(2) 11-23
- [19] Jadal M M 2012 *Indian Streams Research Journal* **2** 1-5
- [20] Clark R C and Mayer R E 2008 *Learning by Viewing Versus Learning by Doing: Evidence-Based Guidelines for Principled Learning Environments* vol 47 (Wiley InterScience) pp 5-13
- [21] Corbeil P 1999 *Sage Journals* **30** 163-80
- [22] Kirikkaya E B, İşeri Ş and Vurkaya G 2010 *The Turkish Online Journal of Educational Technology* **9** 1-13
- [23] Kebritchi M and Hirumi A 2008 *Computers & Education* **51** 1729-43
- [24] Jadal M M 2012 *Journal of Arts and Culture* **3** 110-4
- [25] Meltzer D E 2002 *Am. J. Phys* **70** 1259-68
- [26] Hongkong Arts Development Council 2005 *Joyful learning the arts-in education program*. (Hongkong: Hongkong Arts Development Council) pp 118-50
- [27] Meier D 2000 *The Accelerated Learning Handbook: A Creative Guide to Designing and Delivering Faster, More Effective Training Programs* (New York: McGraw Hill) p 145
- [28] Wolk S 2008 *Joy in school* *Educational Leadership* EL 66(2008)1
- [29] Blake B and Pope T 2008 *Journal of Cross-Disciplinary Perspectives in Education* **1** 59-67.
- [30] Simatwa E M W 2010 *Educational Research and Review* **5** 366-71
- [31] Tarman B and Tarman I 2011 *Elementary Education* **10** 325-37
- [32] Saleh F 2011 *Prosiding Seminar Internasional ke-3 dan Workshop Pedagogik Praktis yang Berkualitas (Bandung)* (Bandung: UPI) pp 13-25
- [33] Adodo S O and Gbore L O 2012 *International Journal of psychology and Counselling* **4** 68-72.
- [34] Majzub R M, Othman Z and Hasan A 2012 *Research Journal of Applied Sciences* **7** 421-25