

**INTEGRATION-INTERCONNECTION OF SCIENTIFIC AND ISLAMIC  
KNOWLEDGE IN THE PHYSICS LEARNING PROCESS**

**THESIS**

**Submitted As A Requirements  
To Achieve Undergraduate Degree  
In Study Programme Of Physics Education**



**Submitted By**

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**STATE ISLAMIC UNIVERSITY  
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**TO  
STUDY PROGRAMME OF PHYSICS EDUCATION  
FACULTY OF SCIENCE AND TECHNOLOGY  
SUNAN KALIJAGA STATE ISLAMIC UNIVERSITY  
YOGYAKARTA  
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**THESIS APPROVAL LETTER**

About : Thesis  
Enclosure :-

To  
The Excellency Dean of Science and Technology Faculty  
Sunan Kalijaga State Islamic University  
Yogyakarta

*Assalamu'alaikum wr. wb.*

After reading, checking, giving guidance, correcting and taking repairing, we, as counseling lecturer, have decided that a thesis of:

Name : Faiq Makhdum Noor  
NIM : 05460034  
Thesis Title : Integration-interconnection of Scientific and Islamic Knowledge in the Physics Learning Process

Have been submitted to Faculty of **Science and Technology** Major of **Physics Education** Sunan Kalijaga State Islamic University of Yogyakarta as one of requirements to get degree of first graduate (S-1) in **Scientific Education**.

In that, we hope the thesis can be examined as soon as possible. Thank you for the attention.

*Wassalamu'alaikum wr. wb.*

Yogyakarta, 22 June 2010  
Counseling Lecturer I

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*Wassalamu'alaikum wr. wb.*

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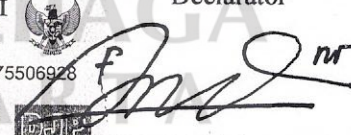
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# MOTTO

I FIND A HAPPINESS  
IN MY PARENTS' SMILE

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# DEDICATION

This Opus is dedicated to:

- + My lovely Mother and Father. Thank you for all of your breath given to me. My pray and love just for you.
- + Academic civilization of State Islamic University of Yogyakarta

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# **INTEGRATION-INTERCONNECTION OF SCIENTIFIC AND ISLAMIC KNOWLEDGE IN THE PHYSICS LEARNING PROCESS**

**FAIQ MAKHDUM NOOR**

## **ABSTRACT**

One of the purposes in learning processes are to guide, to help and to direct the students to have learning experiences. Integrated learning developed by State Islamic University tried to integrate every discipline of knowledge to be united and integrated each other. Learning processes in senior high school, junior high school or elementary school did not have guidance or standard references in integrated learning process in the class. This research tries to find the solution of this problem by using integrated learning syntax which can guide the teacher in doing integrated learning process step by step.

This research includes in qualitative research. This research observes integrated learning process which has been done by teacher in the class. An integrated learning syntax design is arranged by observer based on the learning process. The result of this research is an integrated learning syntax design. The design is obtained based on the suggestion of teachers, consultation or discussion with counseling lecturer and other competent lecturers. Integrated learning syntax could be guidance to the teacher in applying integrated learning process in the class. Besides that, students get intact learning experience in viewpoint of science and Islam.

Data of research instruments show the difference result of each perception of integrated learning process applied. The instruments of teacher's perception (76.19%), student's perception (63.25%) and observer's perception (47.62%) indicated that not all of the schools had applied integrated learning process. On an interview with teachers, the instrument of teacher's perception shows the highest result because most of the teachers said that they have applied integrated learning process. In questionnaire to students, the instrument of student's perception shows the same result in instrument of teacher's perception but the number of result is different. The ability of students to understand about integrated learning process is not complete enough. So that, this research needs an observation in the class to make clearer what happen on integrated learning process. On an observation in the class, the instrument of observer's perception has different result. Based on observer's perception, not all of the teachers have applied integrated learning process properly. So, it is needed continous observation to know about the applying of integrated learning process in the class.

**Key Factors:** Learning process, integrated learning, integrated learning syntax design



## PREFACE

*Alhamdulillah hirobbil'alamin*, all of praise is for Allah SWT. The Substance creating human with the best creation, makes them perfect with the brain and guides them by sending messengers chosen by Him. The Substance gives His guidance and help through the luxury of *iman* and Islam to us. The invocations and greets always send to our great messenger Muhammad SAW bringing us from the dark age to the golden through Islam, the truly religion.

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21. Observer prays may Allah SWT give mercy to all of you.
22. Observer hopes this opus will be useful. Amen.
23. Observer waits for suggestion and chriticism from reader.

Yogyakarta, 22 June 2010

Observer

Faiq Makhdum Noor  
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# CHAPTER I

## INTRODUCTION

### A. Background

School as an organizer of learning process has an important role to teach the students. According to national education minister's role No 41 in 2007 on 23 November 2007 of standard process for elementary and middle educational degree, upgrade of national education system is determined by the vision, mission and development of national education strategy. The vision of national education is to create educational system which is strong and have emphasized in social regulation to enable all of Indonesian people to be qualified and able to live in era of free-competition.

The power of educational system is very important to be applied in our educational environment. School, as formal organizer of learning process, must plan systematically its educational environment in every learning activity. Thus, development of students can aim to reach the purpose. The environment is arranged in curriculum and applied in learning process.

Abdul Wahab, on his journal *Pengembangan Metodologi Pembelajaran* described that there are needs to create some methods in choosing and designing learning methods.<sup>1</sup> One of the methods is by religious approach. In a learning process, religious approach is very important to avoid a dichotomy between scientific and Islamic knowledge, so the students could understand both of them completely. A teacher can insert Islamic message in

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<sup>1</sup> Abd. Wahab. 2005. *Pengembangan Metodologi Pembelajaran*. (Jakarta: Pusdiklat Tenaga Teknis Keagamaan). Page 26

applying principles of teaching such as socialization and correlation principles in the learning process.

Muh. Tasrif in his journal *Agama dan Ilmu pengetahuan : Telaah Pemikiran Kuntowijoyo tentang Relasi Islam dan Ilmu Pengetahuan* said that Indonesian people are era's changing from agriculture country to industrial.<sup>2</sup> In this context, Islamic role should be asked about how Islam solving the conflict and social imbalance. To solve this problem, Islamic approach using *akhlak* and *syari'ah* is no longer relevant. Therefore, Kuntowijoyo offers designs concept of Islamic theory, methodology, axiology and analyzes them in the perspective of relation between science and religion. Kuntowijoyo's thought explains that if there is no integration between science and religion, it would produce negative effects for human life. The integration of knowledge is expected to solve conflict between extreme secularism and fundamentalist religion in many sectors.

Islamic education is hoped to present their contribution's thought to the human life. The contribution's thought can be reached if Islam is able to develop integrated education concept between one of knowledge and another. Integration-interconnection of scientific and Islamic knowledge which is being developed by Sunan Kalijaga State Islamic University, offers knowledge and curriculum development by using integration-interconnection approach. The integration-interconnection approaches are *Islamic-Studies*,

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<sup>2</sup> Muh. Tasrif. 2003. *Agama dan Ilmu pengetahuan: Telaah Pemikiran Kuntowijoyo tentang Relasi Islam dan Ilmu Pengetahuan*. (Ponorogo: Major of Ushuluddin STAIN Ponorogo). Page 211

*Natural Studies, Social Studies and Humanities* related each other and become whole knowledge building.

Schools which have Islamic background are formal Islamic education Institute which is suitable to carry out integrated learning process. The integrated learning process is important to apply in the Islamic schools. The integrated learning process creates complete understanding to students being *Ulul Albab* generations. Thus, schools which have Islamic background should apply integrated learning process.

Learning process which has been done by teachers is found not applying integrated learning process. It is because teachers have not mastered scientific and Islamic knowledge, especially in physics as a knowledge which studies natural phenomena. Besides, not all of teachers have religious educational background, so that they are still difficult to integrate between physics and Islamic knowledge.

On learning process in the class it is needed to arrange learning activities during learning process. The arrangement of activities is called learning syntax. Learning syntax is the teaching model that describes whole arrangements to do learning activity process. Teaching syntax helps us to know clearly about activities done by teachers or students in learning activity process and also tasks that must be done by students.

Learning syntax is different from learning activities planning (RPP). Learning syntax only contains learning activity arrangement, while learning activity planning contains SK, KD, Indicator et cetera. In addition, learning

syntax can be applied for every lesson in the learning activity, while learning activity planning always changes in every subject because learning activity planning must be followed with SK, KD and indicator of every subject.

On some examples of learning syntax released by National Education Department (*DEPDIKNAS*) Direct Instruction (DI), Cooperative Learning (CL) and Problem Based Instruction (PBI), learning syntax has not taken religious approach. It is because there has not been integrated learning syntax design with a good arrangement. Therefore, it is needed to harbor against integrated learning syntax design in order made no dichotomy between scientific and Islamic knowledge.

According to these realities, it is important for observer to observe whether there are integrated learning process application or not and how integrated learning process carried on the class. Integrated learning is expected to increase quality of physics learning related with Islamic knowledge. Thus, Islamic education will be developed and keep the contents of Islamic knowledge.



## **B. Problem Identification**

The problems in this research can be identified such as:

1. Learning process which has not been followed by religious approach will cause a dichotomy of knowledge.
2. The understanding of scientific and Islamic knowledge which has not integrated will cause conflict and social imbalance.
3. Schools which is have Islamic background should apply integrated learning process in the class.
4. There has not been integrated learning syntax design with good arrangement.

## **C. Problem Limitation**

This research is limited to know about physics learning process in Islamic school for Senior High School grade in Yogyakarta in applying integrated learning process. The integrated learning process is learning process applying integration-interconnection approach in learning activities at the class.

#### **D. Problem Formulation**

The problem formulations in this research are:

1. Has the physics learning process at Islamic school for Senior High School grade in Yogyakarta been doing with integrated learning process?
2. How to develop integrated learning syntax design for Senior High School grade?

#### **E. Research Purpose**

The Purposes of this research are:

1. To know whether or not there is an integrated learning process which has been applied in the Islamic school for Senior High School grade in Yogyakarta.
2. To know how the process of integrated learning process which has been applied in Islamic school for Senior High School grade in Yogyakarta is.
3. To make integrated learning syntax design for Senior High School grade.

#### **F. Research Advantage**

The advantages of this research are:

1. Reaching the research repertoire to develop knowledge.
2. Pressuring the importance of integrated learning method in learning process at the class to teach students the values of spiritual and moral.
3. Introducing integrated learning syntax design to teacher.
4. As an alternative learning syntax design which can be used in the class.

## CHAPTER V

### CLOSING

#### A. Conclusion

Based on all of research activities arrangements, researcher concluded that:

1. Research result of learning process in the class gives information about there are schools which have not applied integrated learning process even though some of schools try to integrate physics and Islamic knowledge in learning process in the class.
2. Research result of learning process in the class gives information about the fact that schools that have applied integrated learning process are MA Ali Maksum, MA Muallimin Muhammadiyah and SMA Muhammadiyah 2 Yogyakarta. Schools that have not applied integrated learning process are MAN LAB UIN Yogyakarta, SMA PIRI 1 Yogyakarta and SMA IT Abu Bakar.
3. Learning process in schools has not used integrated learning process. According to the result of research, teachers only show verses and contents of Al-Qur'an as knowledge of teachers. Teachers have no suitable viewpoint about how to integrate physics and Islamic knowledge in the class. Integrating physics and Islamic knowledge is done by teachers at giving explanations of lesson in the class or at giving examples in daily activities.

4. Based on result of research, data are gotten below:

Table 5.1. Result of Integrated Learning

No	Research Instrument	Teacher of MA Ali Maksum	Teacher of MA Muallimin Muh	Teacher of MAN Lab UIN	Teacher of SMA PIRI 1	Teacher of MA Muh 2	Teacher of SMA IT AbuBakar
1.	Interview	100%	78.57%	35.71%	57.14%	92.86%	92.86%
2.	Questionnaire	76.36%	75.47%	48.79%	45.73%	83.38%	49.78%
3.	Observation	64.29%	78.57%	14.29%	14.29%	92.86%	21.43%
	Conclusion	Has integrated	Has integrated	Has not integrated	Has not integrated	Has integrated	Has not integrated

From table above, we can watch result of integrated learning process by teacher in each school. The result can be described below:

- a. Teacher of MA Ali Maksum has applied integrated learning in the class in average result of interview (100%), questionnaire (76.36%) and observation (64.29%). Teacher understands the integration between physics and Islamic knowledge. In learning process, teacher can apply the integration of physics and Islamic knowledge to students. Teacher does not have standard guidance about integrated learning in the class, so that he only integrates physics and Islamic knowledge as far as he knows.
- b. Teacher of MA Muallimin Muhammadiyah has applied integrated learning in the class in average result of interview (78.57%), questionnaire (75.47%) and observation (78.57%). Teacher understands the integration between physics and Islamic knowledge. Teacher explains physics concepts in the viewpoint of religious knowledge by using Al-Qur'an verses and *hadits*. Teacher tries to

teach Islamic physics by changing the name and place into Islamic name and place in learning process.

- c. Teacher of MAN LAB UIN has not applied integrated learning in the class in average result of interview (35.71%), questionnaire (48.79%) and observation (14.29%). Teacher explains concepts of physics in learning in the class. According to teacher, the integration concept has been arranged in the curriculum so that teacher only explains physics concepts. The obstacle in learning process is students often have no mastering of mathematics concepts so that teacher feels difficult in the learning process.
- d. Teacher of SMA PIRI 1 has not applied integrated learning in the class. It is because the result of questionnaire (45.73%) and observation (14.29%), which indicates that in learning process he has no applied integrated learning although in result of interview (57.14%). Teacher feels difficult to integrate physics and Islamic knowledge. There is short learning time to explain the lesson to students. But teacher still tries to integrate physics and Islamic knowledge.
- e. Teacher of SMA Muhammadiyah 2 has applied integrated learning in the class in average result of interview (92.86%), questionnaire (83.38%) and observation (92.86%). Teacher has integrated between physics and Islamic knowledge in learning in the class. Teacher shows Al-Qur'an verses and explains the meaning with his students. The

obstacles are teacher's lack of knowledge, limited reading sources and unstabil spirit of students in learning process.

- f. Teacher of SMA IT Abu Bakar has not applied integrated learning in the class. It is because the result of questionnaire (49.78%) and observation (21.43%), which indicates that in the learning process he has no applied integrated learning although in result of interview (92.86%). Teacher explains physics concept kindly. Teacher felt difficult to integrate physics and Islamic knowledge. The obstacles are short learning time and the different understanding of students.
5. The making of integrated learning syntax design is started from some steps by watching the applying of learning process in school by using some research instruments. Based on learning process, researcher tries to design an integrated learning syntax which has been consulted with counseling lecturer and other expert lecturers. That syntax design will be tested by teachers in the class. So that teachers can give suggestion to refine the syntax before. Researcher revised designed new syntax based on teachers' suggestions.
6. Integrated learning syntax which has been revised can be alternative guidance in integrated learning process arrangement for teacher in the class. Integrated learning syntax can give complete learning experience to students in physics learning from scientific and Islamic knowledge. Besides, students are able to understand natural phenomena which happen in daily activities in the viewpoint of science and Islam.

## **B. Further Suggestions**

1. Schools with Islamic background is hoped to apply integrated learning process in the class.
2. The understanding of teachers and students about Al-Qur'an is needed.
3. The using of Al-Qur'an translation is needed as reference in understanding physics lessons.
4. Learning observation needs to be made more times in better way.
5. The choosing of specific Al-Qur'an verses in each physics chapter can be more developed in learning process by using integration-interconnection paradigm in the class.
6. Scientific understanding on Islamic viewpoint needs to be developed in order that Islamic knowledge can return Islamic civilization triumph.
7. This research can be more developed so that it will result in integrated learning curriculum design.
8. The final integrated learning syntax-design needs to be developed as learning needs for Islamic people progress.

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