

PSC-221

Analysis of Trends in Science Education

Science Education

Zuhdan K. Prasetyo, Prof. Dr. M.Ed.



Science Education
Faculty of Mathematics and Natural Sciences
Yogyakarta State University



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PREFACE

This unit lessons was prepared to support courses Analysis of Trends in Science Education for students of international class in science education Faculty of Mathematics and Natural Sciences. This course is held in the even semester of the academic year 2014/2015. On this occasion to say thank you for the trust Mr. Dean Faculty of Mathematics and Natural Sciences Yogyakarta State University who have commissioned and allowed me to administer this course.

I hope this unit lessons useful for all students for the development of education in Indonesia. I apologize if this task many shortcomings.

Yogyakarta, February, 2015
Lecturer,

Zuhdan K. Prasetyo

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**YOGYAKARTA STATE UNIVERSITY
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
Karangmalang, Yogyakarta.**

SYLLABUS

Study Program : Science Education
Course/ Code : Analysis of Trends in Science Education/PSC - 221
Semester : Even 2014/2015
Lecturer :. Zuhdan K. Prasetyo

I. Course Description

This course develops student competence in analysis of trends in science education, both in USA and Indonesia. This course informs issues and trends in science education in two countries.

II. Standard of Competence

After accomplish this course, students are able to describe trends and analysis of Science Education of the world, particularly in USA and Indonesia.

III. Program of Teaching Learning Activity

Lectures conducted through the class with a variety of strategies including lectures, discussions, presentations, question and answer, and individual assignment to support the achievement of the expected competencies.

Attdnc	Basic Competencies	Essentials Concept	Learning Strategy	References
1	Introduction	Contract, regulation and sanction.	Lectures and discussion	A & B
2	Understand and explain issues and trends in science education	Issues and Trends in Science Education (I&T in SE): USA, Introductory	lectures, discussions, presentations, question and answer, and individual assignment	A & B

3	Understand and explain issues and trends in science education	Issues and Trends in Science Education (I&T in SE): USA, The Beginnings 1860 - 1920	lectures, discussions, presentations, question and answer, and individual assignment	A & B
4	Understand and explain issues and trends in science education	Issues and Trends in Science Education (I&T in SE): USA, Utilitarian/Textbook 1920 - 1957	lectures, discussions, presentations, question and answer, and individual assignment	A & B
5	Understand and explain issues and trends in science education	Issues and Trends in Science Education (I&T in SE): USA, The First Revolution in Science Education 1957 - 1978	lectures, discussions, presentations, question and answer, and individual assignment	A & B
6	Understand and explain issues and trends in science education	Issues and Trends in Science Education (I&T in SE): USA, The Second Revolution in Science Education 1980 – 1990an	lectures, discussions, presentations, question and answer, and individual assignment	A & B
7	Understand and explain issues and trends in science education	Science Education Today	lectures, discussions, presentations, question and answer, and individual assignment	A & B

8	Understand and explain issues and trends in science education	Cognitive Science and Constructivism	lectures, discussions, presentations, question and answer, and individual assignment	A & B
9	Understand and explain issues and trends in science education	Cooperative Learning	lectures, discussions, presentations, question and answer, and individual assignment	A & B
10	Understand and explain issues and trends in science education	Technology	lectures, discussions, presentations, question and answer, and individual assignment	A & B
11	Understand and explain issues and trends in science education	Gender and Cultural Inequities in Science Education	lectures, discussions, presentations, question and answer, and individual assignment	A & B
12	Understand and explain issues and trends in science education	Assessment Reforms in Science Education: Alternative Assessment (Authentic Assessment)	lectures, discussions, presentations, question and answer, and individual assignment	A & B

13	Understand and explain issues and trends in science education	KTSP	lectures, discussions, presentations, question and answer, and individual assignment	A & B
14	Understand and explain issues and trends in science education	KTSP	Presentation and discussion	A & B
15	Understand and explain issues and trends in science education	K-13	Presentation and discussion	A & B
16	Understand and explain issues and trends in science education	K-13	Case study, Assignment	-
Final Exam				

IV. References

A. Compulsory:

Check, Dennis W. (1992). *Science Curriculum Resources Handbook: A Practical Guide for K-12 Science Curriculum*. New York: Kraus International Publications.

B. Additional:

Oliva, Peter F. 1992. *Developing the Curriculum*. New York: Harper Collin Publishers Inc.

V. Evaluation

No.	Activities	Rate Percentage
1	Participation	10 %
2	Assignment	35 %
3	Presentation	30 %
4	Final exam	25 %

Yogyakarta, February, 2015
Lecturer,

Zuhdan K. Prasetyo



**KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI YOGYAKARTA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
Alamat: Karangmalang, Yogyakarta - 55281**

LESSON PLAN

1. Identity

Faculty : MIPA
Study Program : Science Education
Course/Code : Analysis of Trends in Science Education
Credits : 2/ PSC-221
Semester : 2
Prerequisite /code : -
Lecturer : -
Zuhdan K. Prasetyo

2. Basic competency:

Understand the analysis of trends of science education today.

3. Indicators:

Explain the analysis about a taxonomy for science education

4. Topic:

A taxonomy for science education

5. Syntaxes

Steps	Activities	Methods or Media	Time
(1)	(2)	(3)	(4)
Introduction	<ul style="list-style-type: none">- Delivering a brief description of the study design- Demonstrate the relevance of the competence of the lecture- Indicates basic competence to be achieved	Methods: Lecturing Media: Power point containing introduction of the lecture	10 minutes
Core	Explain and discuss a taxonomy for science education	Metode: <ul style="list-style-type: none">- Lecturing- Discussion Media: Power poin containing the approaches of the science teacher professional development	80 minutes

Closing	<ul style="list-style-type: none"> - Provide feedback - Summarize - Describe follow-up 	<p>Metode:</p> <ul style="list-style-type: none"> - Discussion - Assignment <p>Media:</p> <p>Power point containing summary and follow-up assignment</p>	10 minutes
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6. Assessment:

A list of question to conduct orally test

7. References :

A. Compulsory:

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B. Additional:

Oliva, Peter F. 1992. *Developing the Curriculum*. New York: Harper Collin Publishers Inc.

Yogyakarta, February, 2015
Lecturer

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Analisy of Trends in Science Education

**Feb-June Semester
2013/2014**

**Zuhdan K. Prasetyo
Science Education YSU**

Preface

- Analysis of trends in science education is inevitable in our lives. Especially in this century that changes occur so quickly, even so in science education in the world as well as in Indonesia. Analysis of trends, for example in the USA exemplified when Russia successfully launched Sputnik in 1957, the science education in the country is also changing. In Indonesia, it is also the case, ie when the K-13 back to the SBC. In this course will analyze two things in the perspective of science education both in the USA and Indonesia.

The Beginnings: 1860 – 1920

Little that would recognize as “science” took place in schools in the early 1800s. Emphasis on the three Rs and rote memorization was the order of the day.

Of course, the era of Big Science was still in the future. “Science” itself was well established, just not well funded or collaborative in nature, so little societal pressure was brought to bear on including science as a school subject.

The Utilitarian/Textbook: 1920 - 1957

This was a period of prodigious economic and political growth tempered by war, a major depression, and rapid technological development. First an 8-4 pattern of elementary-high school organization was developed. This was followed by a 6-3-3 pattern as the children of the middle years were observed to be in an emotional and physical growth period requiring a transitional schooling phase which became known as the junior high school.

The First Revolution: 1957 - 1978

It was unthinkable! Another country launched an artificial satellite to orbit the earth before the United States did. The “best in the world” complacency of American Science was rattled, and the American public was aghast.

The Second Revolution: 1980 - Present

The First Revolution was a reaction against ingrained classicism, rote memorization of facts, didactic teaching, and a largely outdated and irrelevant science curriculum.

Science Education Today: A Taxonomy for Science Education



The traditional view considered that science was knowledge of the universe that had accumulated throughout recorded history. Only recently (the last thirty-five years) has there been much attention directed to science processes, the skills that scientists use to discover new knowledge. However, it is clear today that there is much more to science education than content and processes.

Science Education Today: Cognitive Science and Constructivism



- Domain I - Knowing and Understanding (knowledge domain)
- Domain II – Exploring and Discovering (process of science domain)
- Domain III – Imagining and Creating (creativity domain)
- Domain IV _ Feeling and Valuing (attitudinal domain)
- Domain V – Using and Applying (applications and connections domain)

Science Education Today: Cognitive Science and Constructivism



Since the 1930s, a behaviorist school of psychology has dominated American education which has assumed that the human mind is an unfathomable “black box.” According to this point of view, learning could be studied only as a set of reinforceable behaviors that were affected by stimulus and reward. Teaching, therefore, was the process of building hundreds of “associations” through practice and reinforcing rewards.

Science Education Today: Cooperative Learning



One of the exciting trends in science education involves a departure from the competitive, individualistic classroom organizations characteristic of American schools. Recent research suggests that immense benefits can be gained when science is taught via a cooperative learning method.

Science Education Today: Technology



Computers, television, videodiscs, and telecommunications are making inroads into science education and continue to promise a technological revolution for our schools. However, due mainly to budgetary limitations, the “revolution” has been far from generally realized.

Science Education Today: Gender and Cultural Inequities in Science Education

Our world is becoming increasingly technologically oriented, and it is imperative that all people understand the importance of science in everyday living. As jobs become increasingly intermeshed with technology, individuals without skills in science and technology will be at a reserve disadvantage in finding a livelihood. All citizens will need sufficient scientific background to make informed decisions on science/technology/society-related issues such as pollution, acid rain, tropical-rainforest deforestation, and AIDS.

Science Education Today: Alternative Assessment



Assuredly, great foment characterizes current curricula and research in science education. However, the professional literature clearly indicates that assessment strategies have not kept pace with extant learning theory, instructional strategies, educational technology, and curricular advances. It is becoming increasingly obvious that scores on existing standardized and teacher-made tests reveal only a narrow and incomplete glimpse of human achievement.

2013 Curriculum (K-13)

- The 2013 curriculum completes the approximation method based on the students' creativity. The new curriculum fulfils three main components of education: knowledge, skill, and attitude. Knowledge is proved by the lesson in general. Skill is from their practical lesson like sports and attitude is reflected by implementing the additional time for religion subject. In view of character building and religion subjects are inserted into the 2013 curriculum more.
- The 2013 curriculum is designed continuously from SD to SMA. Specifically, the SMA competence is a continuance from SD and SMP.

KTSP Sebelum dan Setelah K-13

- Indonesia has changed its curriculum ten times from 1947 to KTSP
- The 2006 curriculum is also known as the “Kurikulum Tingkat Satuan Pendidikan (KTSP) or School-Based Curriculum (SBC)”. The KTSP is designed in order that every school can develop the teaching and learning process according to the student’s character and the situation of school. As a result, the teacher can develop his methods and techniques in the teaching and learning process and increase the students’ competencies too. The successful of the implementation of KTSP may rely on some factors. These factors include a complete readiness of the teacher’s language proficiency, the teacher’s language teaching, and the teacher’s ability to media or tools in the teaching and learning process. If those factors are fulfilled, the main goal of the implementation of KTSP which is to develop students’ competencies will be achieved.

Thank You