

PSC –

Science Teacher Professional Development

Science Education

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



Science Education
Faculty of Mathematics and Natural Sciences
Yogyakarta State University



Science Teacher Professional Development

Science Education



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

Science Education
Faculty of Mathematics and Natural Sciences
Yogyakarta State University

PREFACE

This unit lesson was prepared to support courses Science Teacher Professional Development 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 lesson 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

TABLE OF CONTENTS

Cover	i
Preface	ii
Table of Contents	iii
Syllabus	1
Lesson Plan	5
Course Material	7
Evaluation	12



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

SYLLABUS

Study Program : Science Education
Course/ Code : Science Teacher Professional Development/PSC-217
Semester : Even 2014/2015
Lecturer :. Zuhdan K. Prasetyo

I. Course Description

This course develops student competence in concepts related to the professional development of science teachers. This course informs ways necessary to develop their profession through training, short courses, seminars, and further studies. This course introduces them on a variety of professional science teachers organizations as well as their understanding of professional ethics.

II. Standard of Competence

After accomplish this course, students are able to describe approaches, methods, models of science teacher professional development.

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.

Attn dnc	Basic Competencies	Essentials Concept	Learning Strategy	References
1	Introduction	Contract, regulation and sanction.	Lectures and discussion	A, B1, B2
2	Understand and explain the ways of science teacher professional development	Professional Development	lectures, discussions, presentations, question and answer, and individual assignment	A, B1, B2

3	Understand and explain the ways of science teacher professional	Professional Development	lectures, discussions, presentations, question and answer, and individual assignment	A1, B1, B4
4	Understand and explain the ways of science teacher professional	Professional Development trough: In-service courses, Workshop, Short courses, Training, and Graduate Work	lectures, discussions, presentations, question and answer, and individual assignment	A1, B1
5	Understand and explain the ways of science teacher professional	Professional Development trough: In-service courses, Workshop, Short courses, Training, and Graduate Work	lectures, discussions, presentations, question and answer, and individual assignment	A1, B1
6	Understand and explain the ways of science teacher professional	Professional Development trough: In-service courses, Workshop, Short courses, Training, and Graduate Work	lectures, discussions, presentations, question and answer, and individual assignment	A1, B1
7	Understand and explain the ways of science teacher professional	Professional Development trough: In-service courses, Workshop, Short courses, Training, and Graduate Work	lectures, discussions, presentations, question and answer, and individual assignment	A1, B1
8	Understand and explain the ways of science teacher professional	Professional Organization for Science Teachers	lectures, discussions, presentations, question and answer, and individual assignment	A1, A2, B1

9	Understand and explain the ways of science teacher professional	Professional Organization for Science Teachers	lectures, discussions, presentations, question and answer, and individual assignment	A1, A2, B1
10	Understand and explain the ways of science teacher professional	Other Activities for Professional Growth	lectures, discussions, presentations, question and answer, and individual assignment	A1, A2, B1
11	Understand and explain the ways of science teacher professional	Other Activities for Professional Growth	lectures, discussions, presentations, question and answer, and individual assignment	A1, A2, B1
12	Understand and explain the ways of science teacher professional	Other Activities for Professional Growth	lectures, discussions, presentations, question and answer, and individual assignment	A1, A2, B1
13	Understand and explain the ways of science teacher professional	Evaluating Teacher Performance in the Classroom	lectures, discussions, presentations, question and answer, and individual assignment	A1, A2, B1
14	Understand and explain the ways of science teacher professional	Evaluating Teacher Performance in the Classroom	Presentation and discussion	A1, A2, B1
15	Understand and explain the ways of science teacher professional	Evaluating Teacher Performance in the Classroom	Presentation and discussion	A1, A2, B1
16	Understand and explain the ways of science teacher professional	Evaluating Teacher Performance in the Classroom	Case study, Assignment	-
Final Exam				

IV. References

A. Compulsory:

Collette, and Chiappetta. (2010). *Science Instruction in the Middle and the Secondary School*. New York: MacMillan and Publications Co.

B. Additional:

1. Archibald, Sarah. Et all. 2011. High Quality Professional Development for All Teachers. National Comprehensive Center Teacher Quality.
2. Fenwick, J. Fara. 2011. Fostering Teacher's Lifelong Learning through Professional Growth Plans. Quebec: Laval.

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 : Science Teachers Professional Development /PSC-217
Credits : 2
Semester : 2
Prerequisite /code : -
Lecturer : Zuhdan K. Prasetyo

2. Basic competency:

Understand the ways of science teacher professional development

3. Indicators:

Explain the ways of science teacher professional development

4. Topic:

Approaches in the science teacher professional development

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 the approaches of the science teacher professional development	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 	Metode: <ul style="list-style-type: none"> - Discussion - Assignment Media: Power point containing summary and follow-up assignment	10 minutes
---------	---	--	------------

6. Assessment:

A list of question to conduct orally test

7. References :

A. Compulsory:

Collette, Alfred T and Chiappetta. (2010). *Science Instruction in the Middle and the Secondary School*. New York: MacMillan and Publications Co.

B. Additional:

1. Archibald, Sarah. Et all. 2011. High Quality Professional Development for All Teachers. National Comprehensive Center Teacher Quality.
2. Fenwick, J. Fara. 2011. Fostering Teacher's Lifelong Learning through Professional Growth Plans. Quebec: Laval.

Yogyakarta, February, 2015
Lecturer

Zuhdan Kun Prasetyo
NIP. 195504151985021001



Science Teacher Professional Development

**Feb-June Semester
2013/2014**

**Zuhdan K. Prasetyo
Science Education YSU**

Preface

- The process of formation of professional academic staff require a long way, since someone become learners to pursue a career as an educator. It is inevitable when it became our learners are influenced by the appearance of our own educators, so that they, too, who helped shape our behavior later. Even so, after passing pre-service, entering the world of work as academic staff, we still are in need of improvement and development of more sophisticated behavior that is becoming professional academic staff.

continued

- For that, through is expected to contribute to the efforts to increase professionalism throughout our career. Academic staff development, especially in science education through a variety of ways should we try to realize a qualified science teacher profession, respected and honored. Through means such as whether we can make an effort that desire? That is, most of which will be presented and discussed this.

Introduction

- Science academic staff, we must always keep our recency through development and new development in science education. For example, in the approaches, materials, and new methods are applied lately. In order to work in a professional manner is, we should try to attend professional meetings in science education, and the participation in an in-service workshops that took place both inside and outside the school setting, and studying further to enrich our science background or to learn new strategies in improving our teaching competence. To sustain development in the field of science that we conducted, we should also periodically read and follow the developments in the field of science education. It is also important to note that read journals in science and science education taken to enrich and renew ourselves with regard to new developments occurring in the field of science teaching.

continued

- Indonesian Government Regulation No. 19 Year of 2005 on National Education Standards (NES, 2005: 8) aimed at ensuring the quality of national education in order to educate the nation and form the character and dignified civilization. Referring to these objectives, we are professionally responsible for the development of professionalism and maintain our own profession. Professional development for us should be analogous to professional development in other professions (NSES, 1996: 55).

continued

- Become effective professionals require a long way and ongoing process that emphasized since the experiences of pre-service up in pursuing our respective careers. In the course of our careers, because of changes in social issues so quickly that we need also the opportunity to build understanding and capability of learning science. For this reason, in the course of our careers:
 - a. Through what are the professionalism we developed ?;
 - b. Should we establish a professional organization ?;
 - c. What are the forms of other activities that are able to develop our professionalism?

Professional Development



1. The road to professional development
 - program within the school setting can significantly contribute to the growth and development of them. The development program can be reached in several ways, for example, in-service, workshops, advanced study, and seminars or other scientific activities (Collette, 1995: 487). For beginners and experience academic staff of the

continued ...



- The activity was done because we as academic staff feel, want, and find that there is a new curriculum, new learning approaches, and new scientific development as a result of the desire, time travel, and global demand that is part of some "axiom" that can not be avoided in the development of (Oliva, 1992: 30).



- Inservice activities we take in order to help improve or develop the competence of science and learning for the benefit of the school, for example, ICT in science teaching. Utilization of the latest ICT in learning is a virtual learning (Dir. P2TK & OPT, 2005: 69), the first practice we must learn certain skills and techniques before utilizing and applying ICT in the field.

continued ...



- The workshop, conducted by some of us were chosen to meet the specific needs of our most others. This activity is often the hub of activity in a particular project, such as a laboratory for the development of the activity of certain physical materials or the development of new physics lesson unit. In this activity we work in groups to produce a particular product.



- Further studies, it was inevitable for us to be taken wherever possible. It is not only in Law 19 of 2005 requires us to it, but also because it encourages stakeholders we seek to improve the competitiveness of learners through further study of this. Increased competitiveness of learners is one of the pillars of the development and management of education (high) which in 2003-2010 HELTS mentioned by emphasizing mastery of science and ICT as an engine of growth and development. Similarly autonomy in planning and management of education that is guaranteed in the HELTS allow further study for developing the academic staff in some areas, such as Bantul and Sleman.



- Seminars, as we hold this or other scientific activities by professional associations concerned with the field of study of science and science education, for example, the Indonesian Physical Society branch-Yogyakarta and Central Java, often also be the event to socialize and dissemination of research results physics or physical education conducted by some of us to the other academic staff.

2. Formation of professional organizations

- In developed countries, there are some national organizations for teachers of science, for example in the US, namely the National Science Teachers Association (NSTA) or the American Association of Physics Teachers (AAPT). How in Indonesia, Yogyakarta? As academic staff, so that activities can be categorized our professionals work, in addition to our competent and skilled in a particular field then we also have to accumulate in a professional organization (Notosusanto, 1985: 16). Its membership of each bound by a moral bond defined in the code of professional conduct.

continued ...

- Looking ahead our professional organizations and membership in a professional organization, such as the Association of Physics Teachers Indonesia (AGFI), became an Inevitable and Necessary Efforts. An organization's needs, as an independent institution, not only important for the improvement and development of academic staff competence, but also can not be avoided for the Indonesian nation in the world arena. Reflected in the Law 19 of 2005, which is related to the accreditation and certification. Both things are done for assurance and quality control of education in accordance with the SNP (Article 2 (2)) whose authority is conducted by an independent institution (Article 86, (2)).

Independent Institutions

- Certification, independent bodies for certification established by professional organizations (Article 89, (5)). Professional organizations as an independent agency can perform its function after receiving the recognition of Ministers (Article 88, (1)). To gain admission, professional organizations must shall meet the following minimum requirements:
 - a. Indonesian legal entity which is a non-profit,
 - b. has experienced experts in the field of educational evaluation (Article 88 (2)).

Professional Organizations

- Provincial professional organizations, as mentioned earlier that in Yogyakarta and Central Java collated HFI members and then AGFI. Branch of the provincial-level professional organizations have also been published/publish proceedings, the results of research of their members. The publication is certainly very useful in informing both new discoveries in physics and physics education. Periodically they also have scheduled a scientific meeting in order to keep current the information physics and physics education is very useful for academic staff and students at the college and in high school.

Local Organizations

- Local professional organizations, did not rule out the set of science teachers we yearn for the time being we realize the local scope only. Local organizations, however, before formed a national scale we need to realize. Realization HGIPA-Local organizations that we pioneered hopefully be the forerunner of a fairly prestigious professional organization in the future. Through this organization we pioneered by initiating regular scientific meetings and inform new findings in science also science education in science learning journal, for example. Writing scientific papers published by members of professional organizations, such as HGIF-Local, can ensure continuous contact among its members. It thus, in contrast to scientific meetings are most likely held periodically and can not always be followed.

3. The form of the other activities in the development of professionalism

- Forum communication between academic staff in science, resources and inspiration of the most valuable for beginners is experienced staff. They are very helpful in solving problems in the classroom, for example on the development of competency-based curriculum that is now a right of autonomy for each of the academic staff.

continued

- The assistance is expected from the beginner is criticism and experienced staff evaluation on their performances in both the classroom and the real situation in the form of peer-teaching without learners. Contact between staff of this science professional organization, in MGMPs example, do not rule out the possibility of contact between staff expanded into non-Science. Contact staff with non-Science done for example in order to understand the relationship of science with other fields.

continued ...

- Contacts can be expanded even further with academic staff outside their respective areas through the comparative study visits, conferences and others. Visit us from one region to another in order to collect information, experiences and materials as much as possible will help us in improving the effectiveness of science teaching.

continued ...

- Time job, not something that is not possible we can improve our competence through odd jobs. For example, working in industries relevant to the area that we're in, namely PT IGLAS, Phillips, and others. The second job to obtain additional information relating to the application of science in the industry. Similarly, laboratory work, can improve their skills and understanding of science research methods and useful science education in science learning. Science education majors in YSU, for example, can provide employment opportunities at other academic staff in conducting research as researchers helpers during the research project was carried out.

- **Hobby**, we can improve the competence of the hobby related to the field of science teaching. For example, academic staff Science amateur astronomer or an amateur radio operator. Hobby that not only help enrich learning materials, but also to encourage students to take part in other Science projects.

continued ...

- Research, some academic staff have sufficient stock of knowledge and depth in the field of science, enabling them to conduct research. They can acquire additional academic qualifications in science or related research experience from their previous studies. Thus academic staff with diverse backgrounds should be involved or engaged in their own research, if time allows.

continued ...

- Prejudiced academic staff do not have enough infrastructure to conduct research should attempt to contact the nearest institution in order to assist him in carrying out the study. For example, the staff department of physics education research internship at the Faculty which is deemed to have research facilities more adequate. The same thing should be done by the alumni of YSU science education for classroom action research internship or Research in Improvement of Instruction at his alma mater. Publication of the results of their research in the Journal of the well-known certainly will get better respect of their colleagues and their students, in addition to points for the promotion and rank them.

continued ...

- **Reading**, reading recent literature available for a science teacher is none other than an attempt to keep current that occurs in the development of science and science education. We should be able to take a moment in every week to read the relevant sources in order to follow developments in science and science education. This suggests that we should be able to provide a library in the school setting. In connection with this we really need science education journals or the like, such as those published by NSTA namely: Journal of College Science Teaching, The Science Teacher, Science and Children, Science Scope; or issued AAPT is The Physics Teacher.

Closing

- ▶ This activity together with or other works above course of which are also intended for the development of our professionalism. Being academic staff, as a teacher or lecturer, a job that requires professional choice.

continued ...

- ▶ Therefore, as a profession, in addition to each of us are required to develop expertise and competence in the field of science and education and science, we also need a group or professional organizations.

continued ...

- ▶ The formation of these professional organizations are important for ourselves is also useful as a form of professional responsibility in the form of accountability to the public.

continued ...

- ▶ Here and this time we, Professional Development of Teachers Science participants are challenged to realize everything. Wait no more, viva science and science education! Through this professional organization we increase the nation's competitiveness through the medium of learners who excel in science.

Thank You



EVALUATION

1. Obtain a recent copy of *The Science Teacher* and review the various sections to determine what is generally emphasized. Do the same for another journal specific to your area of expertise, such as the *American Biology Teacher* or the *Journal of Chemical Education*. What types of articles are emphasized in the journals you have selected? Discuss the results of your reviews with the members of your science methods class (Collette & Chiappetta, 2010).
2. Examine several science periodicals, such as *Scientific American*, *Science*, *Discover*, *Omni*, and others that are found in public and school libraries. Determine the types of articles that are emphasized. Discuss the results of your inspections with other members of your science methods class, (Collette & Chiappetta, 2010).
3. Identify the statewide science teacher organization of your home state or the state in which your college or university is located. Obtain recent copies of their journals and newsletters. Determine how active the organizations are in that state by asking experienced science teachers about them. What are the advantages of being a member of such an organization? (Collette & Chiappetta, 2010).
4. Prepare a resume including some of the items indicated in this chapter. Compare your resume with those of other members of your science methods class. After discussion, rewrite your resume to include items that will improve it (Collette & Chiappetta, 2010).
5. Assume you are applying for a position as a middle/junior high school science teacher in a school located in a small rural community. The position has not been advertised but you know that one is available. The only experience you have had is student teaching. Draft a letter of application to the principle of the school. State your qualifications for the position. In writing such a letter of application, you will have to determine the important points you need to discuss in letter, science you have no other guidelines. Compare your letter with those of other students (Collette & Chiappetta, 2010).