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The Analysis of Syllabus Suitability and Learning Materials In Science Teaching

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Abstract: ***The course "Integrated Science" is expected to equip the students of Integrated Science in sights that can be used as a complement to the knowledge of mathematics. Books-used books are books that contain the content of physics, chemistry and biology separately. This is of course contrary to the nature of the "Integrated Science" itself. Learning "Integrated Science" should be taught with the theme-a theme that is familiar with daily life -the day in the form of social science issues. With the research method of literature review found that the adjustment between the syllabus and the books used by the theme of the book "The sciences an integrated approach to" produce17chapters that will be taught in the mathematics department of the university students I researched. Need to develop theme-the theme of the nuances of local knowledge in accordance with the conditions of residence of students in the hope that Science learning integrate dorunified science will be increasingly attractive.***

Keywords: Analysis, syllabus, Integreted science, science books

1. Introduction

Mathematics study program at PGRI University of palembang has been opened since the academic years of 1984/1985. The curriculum of this course had changed in several times, as the development of the era. The obtain curriculums nowadays were 2006 and 2011. Based on the revise discussion meeting of this two curriculums, there were some revisions, namely: 1) add the course of " integrated science" at first semester by considerate to follow the existing middle school's curriculum: 2) the course of " Environmental Science " was deleted because has same contents with the integrated science.

The course of integrated science expected to equiped the university students about this knowledge and can be used as the complement of the mathematical science. In this realization of this curriculum (academic years 2011/2012 until now), the students of this science has separated between the subject's content of physics, chemistry and biology. The using books were books that contained physics, chemistry, and biology separately. This matter directly incompatible with the substance of " integrated science " itself.

The students of this science should be taught by using the familiar themes in their daily life in the form of science issues. The social scientific issues that close in society life was useful to open the student's knowledge. The example of this issues are biotechnology, cloning, provision genetics engineering, environment issue (global warming, acid rain and etc) and so on. These issues have been familiar in this era. This is important to choose the guide book to teach this " integrated science", and it may not allow to use the handout beside use exist books that has concentrated that content in one theme. The one of a book that can be used is " "*The sciences an integrated approach*" (Trefil, 2010).

The choosing of this theme aimed to students be aware with science (science literature), easy to understand and applying the science in their life. The phenomena such as landslides, flood, the pilling up of fields to build the housing that does not consider the environment condition and bad habit as throwing the cigarette and rubbish carelessly, etc. Sure it can prevent if the students want to understand about science literation. The right understanding about this science will open the student's eyes to understand the natural process and doing right in term of treat the nature and around the environment.

According to OECD, science, literature defined as:
"The scientific knowledge of someone and its uses to identify a question, procure the new knowledge, describe the scientific phenomenon and collect the conclusion based on the facts about scinece issue and understanding about science characteristics as a form of human knowledge and investigation, an awareness of how science and technology can form a material, intelectual environmnet, and our culture, and also a willingness to be mixed up with the science ussues, and related ideas science, as an reflection of citizen". (OECD, 2009)

Reffering to a background explanantion above, so it can be formulate that the problem need to solve through this study was about how a suitability of sylabus of intergrated science against to used science teaching materials by that, so the aim of this paper was to analized a suitability between sylabus in the cirrucullum with the teachin materials used on the " intergrated science " course. Meanwhile the retrived advantage of this study was as the input to a completeness of intergrated IPA implementation in Palembang PGRI University.

2. Method

The methods used in this study was the literature study, because the data analysis and teaching material has done by collecting the material and document as study source. So that, this study begin by collecting all related documents with the intergrated science study in formed of curricullum,

sylabus, and books/ teaching material that used by the lectures. After all study sources collect, it doing the deep analysisi to know the suitability between the sylabus in the curricullum with the taching material used. So the offered the datas held by the anlytics descriptive pattern.

3. Datas and discussion

3.1 Data

From the collected document sources in formed of curriculum, syllabus and teaching material of " integrated science ", it held the suitability analysis between curriculum document, syllabus, with the teaching material that using by all lectures. The analysis result showed in following table

Table 1: Syllabus Of " Integrated Science " Course

Chemistry		
No	Materials	Sub- materials
1	Introduction	Meaning of chemistry, Meaning of material, Scientific review, Material identification, Material changing, Meaning of energy, energy conservation and kinds of energy.
2	Atom conceptand periodic system	The meaning of the Atom, atom concept, periodic system, role of filling electron,determining of the period and classification
3	Stoichiometry (mole concept)	Meaning of stoichiometry, the amount of elements/ compound in the reaction, solution, molarity concentration of solution,molarity, normality, percentage, ppm and ppb a essence.
4	Thermochemistry	Meaning of Thermochemistry , exothermic reaction&Endoterm , Black law, calorimeter , calor reaction.
Biology		
1	Organism materials/ life chemistry	Biologyas a science, characteristics of science andscientific method, characteristics oflife organism, structure of life organism.
2	Cell	Theory ofcell, structure and function of parts of cell, reproduction/cell cycles, background of cell metabolism.
3	Background of living genetics	The base background of character inheriting,determining chromosomes to gender, genetics substance,genetic code, Protein synthetics, genetics engineering.
4	Structureandplants function	Plant tissues, plant organ, nutrition and water absorption and nutrient, the growth and flowering.
5	structureand animal function	Animal tissues, organ function, excretion system
Physic		
1	Kinematics in one dimension	Undeviatinguniform movementand undeviating uniform changing movement, GLBB faster and slower
2	Kinematics two dimensions	Parabolic movement
3	Particle dynamic	Newton lawsand its application
4	Energyand exertion	Energy constancy law, constancy mechanic energy law
5	Momentumand momentum	Moment constancy law, kinds of collision

Table 2: Content That Contains In A Teaching Material Of " Integrated Science "

	Chapters																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Physics	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Chemistry	√	√	√	√	√	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Biology	√	√	√	√	√	√	-	√	√	√	√	√	√	√	-	√	√	√	√	√	√	√	√	√	√
Technology	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Environment	√	√	√	√	√	√	-	√	-	√	√	√	-	√	-	√	√	√	√	√	√	-	√	√	√
Astronomy	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Geology	√	√	√	√	√	√	-	√	√	√	√	√	√	√	-	√	√	√	√	√	√	√	√		√
Medical and savety	√	√	√	√	√	√	-	√	√	√	√	√	√	√	-	√	√	√	√	√	√	√	√	√	√
tion:																									
1. Science Theme : science is the way to ask and answer a question about phsyics thing in around of universe.																									
2. Rool of Nature Theme : the newton's law about motion and gravity can be predicted a behavior of things in earth and space.																									
3. Energy Theme : there are many forms of different energy can be switched, and amount of total energy in an isolated system was eternal.																									
Chapter 4. Calor and The Second Thermodinamical Laws. Theme : calor is a form of energy that flew from a hot place to a cold place.																									
Chapter 5. Electrics and Magnetics Themes : electrics and magnetics are two different aspects and electromagnetic energy.																									
Chapter 6. Wave and Electromagnetic Radiation. Theme : when a things containing electrics be accelerate, so it will produce a raditaion energy and electromagnetics wave that run by light acceleration.																									
Chaper 7. Albert Einstein and Relativity Theory. Theme : all observation, do not care whether them framework references, to see a same universe law.																									
Chapter 8. Atom Theme : all things in around of us made from an atom, a construction block of chemisitry in our world.																									

Chapter 9. Quantum Mechanics Theme : in substomics scale, all things quantitated, every measuring on significant scales altered an measured object.
Chater 10. Atom in Combination: Chemsitry Bond Theme : atom bonded colectively in chemist reaction by doing a electorn resets.
Chapter 11. Materials and its Characteristics. Theme : a materials was a result of the arrangement of atoms and arrangement of chemist bond that bonded atom colectively.
Chapter 12. Core of Atom Theme : nuclear energy depends on a perode conservation become an energy
Chapter 13. Final Structur from a Materials. Theme : all materials made from quarck and lepton, those are basic construction blocks from whole universe we knew.
Chapter 14. Stars Theme : sun and other stars used a nuclear fusion reaction to altered a mass to be energy, and finally, when a nuclear fuel a stars have used up, the stars could be burned out.
Chapter 15. Cosmology Theme : the universe started a million years ago trough a big bang explosion, and have developed since that time.
Chapter 16. Earth and Another Planet. Theme : earth, the one of sun orbiting planet. Formed 4, 5 million ago from a dust cloud.
Chapter 17. Techtonic Plates Theme : earth altered because a slowest convection from a warm stones in a belly of earth.
Chapter 18. Sycles that Happened in Earth Theme : all things under and in underneath of ground moving in a cycles.
Chapter 19. Echology, Ecosystem and Environment Theme : ecosystem is a each dependent comunity from kind things that recycling a materials, meanwhile energy flew from organism.
Chapter 20. Living Strategy Theme : organism used a different strategy to handle kinds of problems to get and use a material and energy.
Chapter 21. A Parts of Cell and Living. Theme : living realized by chemist compound, and it happened in cell.
Chapter 22. Living Molecule. Theme : main parts of cells formed from simple blocks molecule construction
Chapter 23. Clasic Genetics and Modern. Theme : all organism used same genetics code to guide a chemistry reaction in every cell.
Chapter 24. Science concerned to New living. Theme : our new understanding about genetics mechanism that directed to a great advancement technology in mediacal parts and others that influece our living aspect.
Chapter 25. Evolution Theme : all organism in earth evoluted from singgle cell organisme because the natural selection.

Table 3: The Suitability Between Syllabus With The Theme In Teaching Material of " Intergrated Science "

Current Valid syllabus	Each chapter themes in the teaching material of " *The sciences an integrated approche*"
Chemistry : Scietific Knowledge Biology : Biology as a knowledge, characteristics of science and scienctific methode	Chapter 1 : science Theme : science is the way to ask and answer a question about phsyics thing in around of universe.
Phsycs : Newton Laws and its Application	Chapter 2 : The rool of universe Theme : the newton's law about motion and gravity can be predicted a behavior of things in earth and space.
Chemistry : Meaning og thermochemistry, exotherm and endoterm reaction, black law, caliometers. Calor reaction.	Chater 3 : Energy Theme : there are many forms of different energy can be switched, and amount of total energy in an isolated system was eternal.
Chemistry : Meaning og thermochemistry, exotherm and endoterm reaction, black law, caliometers. Calor reaction. Phsycs : eternal law, energy	Chapter 4 : Calor and The Second Thermodinamics Law Theme : calor is a form of energy that flew from a hot place to a cold place
	Chapter 5. Electics and Magnetics Themes : electrics and magnetics are two different aspects and electromagnetic energy.
	Chapter 6. Wave and Electromagnetics Radiation. Theme : when a things containing electrics be accelerate, so it will produce a raditaion energy and electromagnetics wave that run by light acceleration.
	Chaper 7. Albert Einstein and Relativity Theory. Theme : all observation, do not care whether them framework references, to see a same universe law.
Chemsitry : meaning of atom, atom	Chapter 8. Atom

concept, periodicts system, electrom filling rool, periode deciding and group.	Theme : all things in around of us made from an atom, a construction block of chemisitry in our world.
	Chapter 9. Quantum Mechanics Theme : in substomics scale, all things quantitated, every measuring on significant scales altered an measured object.
Chemsitry : meaning of atom, atom concept, periodicts system, electrom filling rool, periode deciding and group.	Chater 10. Atom in Combination: Chemsitry Bond Theme : atom bonded colectively in chemist reaction by doing a electorn resets.
Chemistry : material meaning, scientific knowledge, material identification, material changing.	Chapter 11. Materials and Its Characteristics. Theme : a materials was a result of arrangement of atoms and arrangement of chemist bond that bonded atom colectively.
Chemistry : meaning of energy, energy conservation, and kinds of energy.	.Chapter 12. Core of Atom Theme : nuclear energy dependent on a perode conservation become a energy.
Chemistry : meaning of materials, scientifict knowledge, material identification, materials alteration.	.Chapter 13. Final Structur From a Materials. Theme : all materials made from quarck and lepton, those are basic construction blocks from all universe we knew.
Chemistry : meaning of material, scientific knowledge, material identification , material alteration.	Chapter 14. Stars Theme : sun and another stars used a nuclear fusion reaction to altered a mass to be energy, and finaly, when a nuclear fuel a stars have used up, the stars could be burned out.
	Chapter 15. Cosmology Theme : the universe started a million years ago trough a big bang explosion, dan have developed since that time.
	Chapter 16. Earth and Another Llanets. Theme : earth, the one of sun orbiting planet. Formed 4, 5 million agon from a dust clouds.
	Chapter 17. Techtonic Plates Theme : earth altered because a slowest convection from a warm stones in a belly of earth.
Biology : plant tissues, plant organs, nutrition, and water absorption, along with nutrient, growing and flowering.	Chapter 18. Sycles that Tappened in Earth Theme : all things under and in underneath of ground moving in a cycles.
Biology : plant tissues, plant organs, nutrition, and water absorption, along with nutrient, growing and flowering.	Chapter 19. Echology, Ecosystem and Environment Theme : ecosystem is a each dependent comunity from kind things that recycling a materials, meanwhile energy flew from organism.
Chapter 19.Ecology, Ecosystems, andEnvironment Theme:An ecosystem isa communityof interdependentofthings thatrecyclematerialswhileenergyflows throughliving organisms. Biology : cell theory, structure and function of cell's parts, reproduction/cycles.	Chapter 20. Living Strategy Theme : Organism used a different strategy to handle kinds of problems to get and use a material and energy.
Biology : cell theory, structure and function of cell's parts, reproduction/ cells, cell cycles, methabolism of cell's basics Chemistry : calor reaction.	Chapter 21. A parts of Cell and Living. Theme : living realized by chemist compound, and it happened in cell.
Chemistry : material alteration, atom concept. Biology : cell theory, structure and fuction of cell's parts, reproduction/ cell's structure, basics of cell metabolism	Chapter 22. Living Molecule. Theme : main parts of cells formed from simple blocks molecule construction.
Biology : basic principle of characteristic inheriting, gender determining chromosome, genetics materials, genetics code, protein syntetics, genetics engineering.	Chapter 23. Clasic Genetics and Modern. Theme : all organism used same genetics code ti guide a chemistry reaction in every cell.
Biology : basic principle of characteristic inheriting, gender determining chromosome, genetics materials, genetics code, protein syntetics,	Chapter 24. Science Concerned to New Living. Theme : our new understanding about genetics mechanism that directed to a great advancement technology in mediacal parts and others that influece our living aspects.

genetics engineering.	
	Chapter 25. Evolution Theme : all organism in earth evoluted from singgle cell organisme because the natural selection.

4. Discussion

In chapter I of general rool, point one number 19 UU RI Number 20, year 2003 about national education system, stated that the meaning of curriculum is a set of plann and sett about goal, containt and learning material, along with the way used as the guide in implementing a learning activity to obtain a certain goal. Curriculum included all activities that aimed to give a education experience to students. There are 3 form of curriculum organizing (Dakir, 2010):

1. Separate subject curriculum: Curriculum contents arranged in a separate content.
2. Correlated curriculum:The curriculum contents arranged by a same contents that grouping in a subject, e.g IPA arranged by a content: phsyc, chemistry and biology.
3. Integrated curriculum: The contents of curriculum have not showed each contents yet. Integrated curriculum created by foccusing a content to certain problem that need to be solve by giving a material or teachin material from a science or contents.

A foccusing of problems on integrated curriculum held by deciding a theme/issue/problem that appointed in disccusion of content material. The way to mixing of content into a theme/issue/problem introduced by Forgarty (Forgarty, 1991) in a models of intergrated IPA development. The one of intergrated IPA learning form was a intergrated learning in Webbed model. In a book of " *The sciences an integrated approche*" (Trefil, 2010) a model of intergrated IPA developmnet that choose by author was a form of Webbed, where all contents related by one appointed theme.

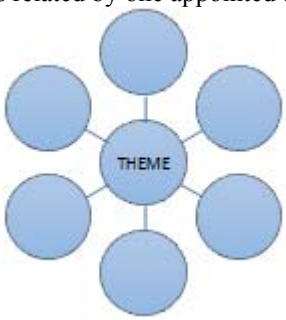

Figure 1: Webbed map digram (Fogarty,1991)

To get any suitable material on learning intergrated science, author tried to intergrating exist sylabus with each explanation theme in a book of " *The sciences an integrated approche*". So it will deciding wheter chapter will use in learning. Themes and appointed content on that book explained in Table 2. In this table can be seen if every chapter of book " *The sciences an integrated approche*" tied up in a theme with each contents. The appointed kontent in every chapter are phsycs, chemistry, biology, mediacal and savety, environment, astronomy, geology, and technology. there are some chapters that were not entering all content. This is beacause that theme was not need that content.

For example in chapter 15 that explained about cosmology with only entering four contents namely phsycs, chemsitry, tekhnology, and astronomy. In a existing syllabus was only contained a phsycs, chemistry, and biology in separetely (Table 1). Table 3 showed a suitability between syllabus and chapeter in this book " *The sciences an integrated approche*". From Table 3 it can be conclude that the suitability topics with the current syllabus are: science, universe rule, energy, calor, and second thermodynamics, atom and atom in combining: chemist society, materials and its nature, atom core, final structure, and a material, stars, cycles hapened in earth, echology, echosystem, and environment, living strategy, cell's parts of organism, molecul of organism, clasic and modern genetics, science concerned to new life.

In curriculum 2013statedthat the orientation science learning is the ability of applicative, developing the ability to think, learn, curiosity and attitude development funds out its social and natural environment. IPA is also devoted to the introduction of the biological and the surrounding natural environment, as well as the introduction of the various advantages of the archipel ago. Through an integrated learning science, students can gain hands-on experience, so as to add strength to accept, store, and apply the concepts they have learned. Thus, students are trained to be able to find themselves a variety of concepts studied thoroughly(holistic), meaningful, authentic and active.

How learning experience designed packaging teachers influence on the meaningfulness of the experience for the learner. Experience shows the links to learn more conceptual elements will make the learning process more effective. Conceptual linkages are studied by the relevant scientific field of study will form a cognitive schema, so that children acquire knowledge integrity and roundness. Obtaining the integrity of science learning, as well as the roundness views on life, the real world and natural phenomena can only be reflected through integrated learning.

According Trefil, James and Robert Hazen (2007: xii), an integrated approach (an integrated approach)involves a scientific process, organizing principles, organizing the natural integration of scientific knowledge and its application in everyday life. In addition, in an integrated approach is also expected to link the students in other fields include physics, astronomy, chemistry, geology, biology, technology, the environment, health and safety. Therefore, the lack of compatibility between the syllabus and the books/instructional materials are used, there should be concrete measures for adjustment. This is need to be done so that the teachers" integrated science" has a clear and accurate guidelines.

5. Conclusion

From explanation above, so it can be conclude that :

1. The use of theme in intergrating science teaching or intergrating IPA were a neccesity, beacause that integration was a power of its science. Science learning wheter in separate or does not use any theme was a incompatible with the nature of intergrating science itself.
2. The suitability between sylabus and sylabus book with the theme in book of " *The sciences an integrated approach*" created at least 17 chapters will be teach to students of mathematics study courses in observed university.

6. Recomendations

1. Its need to be develop the local wisdom theme that sutable with the condition of students place, by hope this learning material will be more interesting.
2. This local wisdom theme will be interesting observation thing and produce the students and a intergrating science book of indonesian or local wisdom.

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