Unesa Journal of Chemical Education
Vol. 1, No. 1, pp. 41-46 Mei 2012 *ISSN: 2252-9454*

DEVELOPMENT OF SCIENCE-CHEMITRY STUDENT WORKHEET ORIENTED SOMATIC, AUDITORY, VISUAL, AND INTELLECTUAL (SAVI) IN THE TOPIC MATTER CHANGES FOR JUNIOR HIGH SCHOOL

Ayu Lestari, Utiya Azizah
Department of Chemistry Math And Science Faculty Unesa
Hp 085731435862, e-mail: lestari_cantik29@yahoo.com

Abstrak: Tujuan penelitian ini adalah untuk mengetahui kelayakan Science-Chemsitry Student Worksheet berdasarkan kriteria isi, kesesuaian dengan SAVI, penyajian, dan kebahasaan. Metode yang digunakan pada penelitian ini adalah R&D (Research and Development) dengan 4D Models (Define, Design, Develop, Disseminate) oleh Thiagarajan sebagai tahap pengembangannya. Penelitian ini dibatasi pada tahap Define, Design, dan Develop. Hasil penelitian ini adalah kelayakan isi worksheet untuk gaya belajar somatic, auditory, visual, dan intellectual adalah 90,28%, 94,44%, 90,28%, dan 94,44%; kelayakan kesesuaian worksheet dengan SAVI untuk gaya belajar somatic, auditory, visual, dan intellectual adalah 75%, 83,33%, 90,47%, dan 91,67%; kelayakan penyajian worksheet untuk gaya belajar somatic, auditory, visual, dan intellectual adalah 81,48%, 86,11%, 88,57%, dan 83,33%; kelayakan kebahasaan worksheet untuk gaya belajar somatic, auditory, visual, dan intellectual adalah 83,33%.
Kata kunci: Matter Changes, Science-Chemsitry Student Worksheet, somatic, auditory, visual, intellectual (SAVI)

Abstract: The research is aimed to know the feasibility of Science-Chemistry Student Worksheet based on the content, the compatibility of SAVI, the appearance, and language. The method used in the research is R&D (Research and Development) and 4D Models (Define, Design, Develop, Disseminate) by Thiagarajan as development phase. The research is limited in Define, Design, and Develop. The result of the research is the content feasibility of worksheet for learning style of somatic, auditory, visual, and intellectual are 90,28%, 94,44%, 90,28%, and 94,44%; the feasibility of SAVI compatibility of worksheet for learning style of somatic, auditory, visual, and intellectual are 75%, 83,33%, 90,47%, and 91,67%; the appearance feasibility of worksheet for learning style of somatic, auditory, visual, and intellectual are 81,48%, 86,11%, 88,57%, and 83,33%; the language feasibility of worksheet for learning style of somatic, auditory, visual, and intellectual are 83,33%.
Key words: Matter Changes, Science-Chemistry Student Worksheet, somatic, auditory, visual, intellectual (SAVI)

INTRODUCTION

One of the successful of a nation is seen from how the education capable to form quality human source. Therefore, the quality of education have to be increased as fast as globalization flow.

Pioneering International School (RSBI) is implementation of Undang-undang No. 20 tahun 2003 pasal 50 ayat (3) about National Education System, government and/or region government do as less as one education unit in all education grade to be developed become education unit standardized international [1]. RSBI uses adoptive dan adaptive curriculum, KTSP curriculum as national curriculum that is integrated with international curriculum.

SMPN 1 Surabaya is one of Pioneering International School. SMPN 1 Surabaya uses bilingual in learning process. Curriculum that is used by SMPN 1 Surabaya is KTSP curriculum and RSBI curriculum made by Education Directorate. Application of curriculum and learning process of

RSBI uses principles such, use curriculum that use nationally with RSBI curriculum, teach forein language especially using for english, balance children development aspect such cognitive aspect (intellectual), social and emotional aspect, and physic aspect [1]. While the principle of KTSP curriculum appropriate with BSNP is centered in potency, development, necessary, importance of student dan environment. For supporting the reach of the goal, competency development of student is appropriated with the potency, development, necessary, importance of student dan environment [2].

Based on questionnaire result that 70,4percents students states difficulty in the topic of Matter Changes. Standard Competence of this topic is understanding physical and chemical properties and natural phenomena through observation. Basic Competence of the topic is identifying and explaining physical and chemical changes and its characteristics and chemical reaction through a simple observation.

Each student has different learning style to understand the information given by the teacher. Based on the questionnaire 18 percents of students are somatic, 30 percents of students are auditory, 41 percents of students are visual, and 11 percents of students are intellectual.

Based on the effort of increasing education quality, Ibrahim states that learning and teaching process needs the presence of learning instrument [3]. One of instrument that can support the reach of learning goal is student worksheet. It can be seen from questionnaire result that 90 percents of students state student worksheet can help them to study.

Worksheet is sheets contain tasks that must bedone by students. Generally, Worksheet contains guide and use of worksheet and steps to do the tasks. Tasks in the worksheet must be appropriate with basic competence will be reached. Tasks is given in the worksheet can be theoretic or practical task [5].

Student worksheet as learning media and has other functions, alternative way for teacher to assist learning or recognize an activity as learning and teaching, fasten teaching process and save teaching time and how far the matter that has already understood by students, make a limited teaching instrument be effective, help student more active in learning and teaching process, increasing student's motivation if Student Worksheet is arranged neatly, systematic, easier to be understood by student so that it interest student's attention, easier to finish individual, group or classical tasks because students can do tasks based on learning speed, and increase student's skill to solve the problem [5].

Term of SAVI is Somatic, Auditory, Visual, and Intellectual. The four terms have mean concern with study. The mean of the terms are stated by Meier [4] that is Somatic is learning by moving and doing, Auditory is learning by talking and hearing, Visual is learning by observing and picturing, Intellectual is learning by problem solving and reflecting. SAVI approach integrates the four terms so that student and teacher can make condition class become enjoyable.

The theory of Constructivistic based on Piaget [6] is focused in individual cognitive development depends on the activeness of student interact with environment. Constructivistic principles based on Piaget is applied in activity in Science-Chemistry Student Worksheet that make student use all the sense in learning.

Therefore, Science-Chemistry Student Worksheet is necessary developed based on the student's learning style in order to increase student's learning motivation. It is strengthened by Meier that basic principles of learning is learning by involve all mind and body [4].

Science-Chemistry Student Worksheet oriented SAVI is worksheet that is designed into 4 Science-Chemistry Student Worksheet are

Somatic, Auditory, Visual, and Intellectual. Each Science-Chemistry Student Worksheet has 3 worksheets are Physical and Chemical Properties, Physical and Chemical Changes, and Chemical Reaction.

METHOD

The research of Science-Chemistry Student Worksheet uses R&D method (Research and Development). It consists of three phases, the study of introduction, the study of development, and evaluation. However the research is limited in the study of development that is in the phase of limited try out the products followed by revising products. In the study of development used 4-D model from Thiagarajan that is limited in Develop phase [7].

Science-Chemistry Student Worksheet that is developed validated by 1 Chemistry lecturer, 2 Science teacher, and 1 language expert. Validation result is analyzed by descriptive quantitative method. The analysis is done to every aspect that in the validation sheet. Percentage of data is gotten based on calculation Likert scale such in Table 1.

Table 1. Likert Scale

Rating	Scale value
Very bad	1
Bad	2
Good	3
Very good	4

Riduwan [8]

Formulation that is used in calculation to get the percentage is

$$P\,(\%) = \frac{sum\ of\ \ collected\ \ data\ score}{criteria\ \ score}\ x\,100\%$$

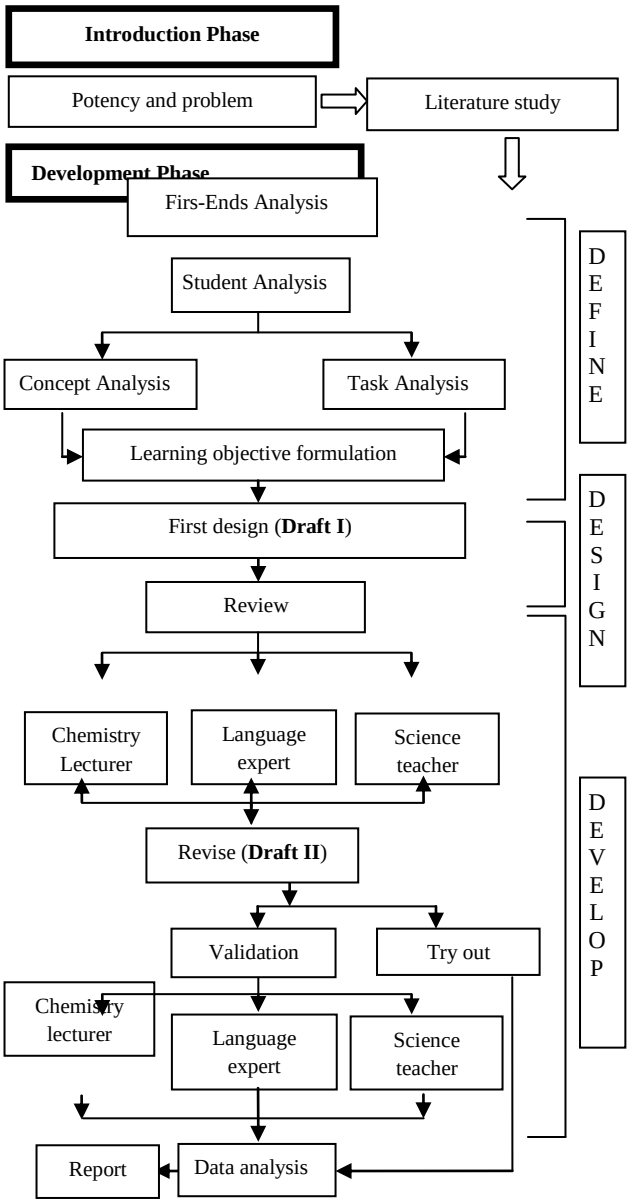
Score percentage that has been gotten interpreted in Table 2.

Tabel 2. Score Interpretation

Percentage	Criteria
0 – 25	Very weak
26-50	Weak
51 – 75	Strong
76 – 100	Very strong

Riduwan [8]

Based on the criteria, Science-Chemistry Student Worksheet oriented SAVI is feasibly if the percentage each feasibility criteria reach ≥ 51% [6].



Picture 1. Development Design of 4-D Model by Thiagarajan

The method of data analysis that is used in the research is data analysis from validation of content, the compatibility with SAVI, and appearance. Analysis of content feasibility consists of (a) the compatibility of concept with RSBI curriculum, (b) the compatibility of

concept with Competence standard and basic competence, (c) the concept is appropriate to learning indicator, (d) the resume of concept contain main concept, (e) question in evaluation is understood easily and appropriate to indicator, (f) experiment activity is appropriate to concept and basic competence that will be reached, (g) the compatibility of SAVI. Analysis of the appearance feasibility consists of (a) cover presents the content, (b) the clarity of indicator that will be reached, (c) the appearance of worksheet improve the curiosity, (d) the feasibility of illustration with the concept, (e) illustration can help understanding the concept, (f) the picture is followed by the source, (g) the concept is centered to the students, (f) the reference is written as the rule, and (g) the appearance of worksheet is interesting.

Percentage of questionnaire is gotten from the calculation of Likert scale in the Table 1.

RESULT AND ANALYSIS

In Science-Chemistry Student Worksheet for somatic consists of 3 worksheets. The average percentage of the content feasibility of worksheet 1, 2, and 3 is 90,28%. Based on Score Interpretation of Likert scale in Tabel 2, the feasibility of content is very strong.

The average percentage of the feasibility of the compatibility with SAVI of worksheet 1, 2, and 3 is 75%. Based on Score Interpretation of Likert scale in Tabel 2, the feasibility of compatibility with SAVI is strong.

The average percentage of the appearance feasibility of worksheet 1, 2, and 3 is 81,48%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of appearance is very strong.

The average percentage of the language feasibility of worksheet 1, 2, and 3 is 83,33%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of appearance is very strong.

The data can be seen completely in Table 3.

Table 3. Validation result of Science-Chemistry Student Worksheet (SOMATIC)

Nu	Aspect	Percentage (%)			Average percentage (%)	Criteria
		WS 1	WS 2	WS 3		
1.	Content	90,28	90,28	90,28	90,28	Very strong
2.	Compatibility with SAVI	75	75	75	75	Strong
3.	Appearance	81,48	81,48	81,48	81,48	Very strong

In Science-Chemistry Student Worksheet for somatic consists of 3 worksheets. The average percentage of the content feasibility of worksheet 1, 2, and 3 is 94,44%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of content is very strong.

The average percentage of the feasibility of the compatibility with SAVI of worksheet 1, 2, and 3 is 83,33%. Based on Score Interpretation of Likert scale in Tabel 2, the feasibility of compatibility with SAVI is very strong.

The average percentage of the appearance feasibility of worksheet 1, 2, and 3 is 86,11%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of appearance is very strong.

The average percentage of the language feasibility of worksheet 1, 2, and 3 is 83,33%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of appearance is very strong. The data can be seen completely in Table 4.

Table 4. Validation result of Science-Chemistry Student Worksheet (AUDITORY)

Nu	Aspect	Percentage (%)			Average percentage (%)	Criteria
		WS 1	WS 2	WS 3		
1.	Content	94,44	94,44	94,44	94,44	Very strong
2.	Compatibility with SAVI	83,33	83,33	83,33	83,33	Very strong
3.	Appearance	86,11	86,11	86,11	86,11	Very strong

In Science-Chemistry Student Worksheet for somatic consists of 3 worksheets. The average percentage of the content feasibility of worksheet 1, 2, and 3 is 90,28%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of content is very strong.

The average percentage of the feasibility of the compatibility with SAVI of worksheet 1, 2, and 3 is 90,47%. Based on Score Interpretation of Likert scale in Tabel 2, the feasibility of compatibility with SAVI is very strong.

The average percentage of the appearance feasibility of worksheet 1, 2, and 3 is 88,57%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of appearance is very strong.

The average percentage of the language feasibility of worksheet 1, 2, and 3 is 83,33%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of appearance is very strong. The data can be seen completely in Table 5.

Table 5. Validation result of Science-Chemistry Student Worksheet (VISUAL)

Nu	Aspect	Percentage (%)			Average percentage (%)	Criteria
		WS 1	WS 2	WS 3		
1.	Content	90,28	90,28	90,28	90,28	Very strong
2.	Compatibility with SAVI	90,47	90,47	90,47	90,47	Very strong
3.	Appearance	87,96	89,81	87,96	88,57	Very strong

In Science-Chemistry Student Worksheet for somatic consists of 3 worksheets. The average percentage of the content feasibility of worksheet 1, 2, and 3 is 94,44%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of content is very strong.

The average percentage of the feasibility of the compatibility with SAVI of worksheet 1, 2, and 3 91,67%. Based on Score Interpretation of Likert scale in Tabel 2, the feasibility of compatibility with SAVI is very strong.

The average percentage of the appearance feasibility of worksheet 1, 2, and 3 is 83,33%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of appearance is very strong.

The average percentage of the language feasibility of worksheet 1, 2, and 3 is 83,33%. Based on Score Interpretation of Likert scale in Table 2, the feasibility of appearance is very strong. The data can be seen completely in Table 6.

Table 6. Validation result of Science-Chemistry Student Worksheet (INTELLECTUAL)

Nu	Aspect	Percentage (%)			Average percentage (%)	Criteria
		WS 1	WS 2	WS 3		
1.	Content	94,44	94,44	94,44	94,44	Very strong
2.	Compatibility with SAVI	91,67	91,67	91,67	91,67	Very strong
3.	Appearance	87,96	89,81	87,96	88,57	Very strong
4.	Language	85	80	85	83,33	Very strong

CONCLUSION

Based on the result and analysis can be concluded that Science-Chemistry Student Worksheet is usable based on the content feasibility of worksheet for learning style of somatic, auditory, visual, and intellectual are 90,28%, 94,44%, 90,28%, and 94,44%. The feasibility of SAVI compatibility of worksheet for learning style of somatic, auditory, visual, and intellectual are 75%, 83,33%, 90,47%, and 91,67%. The appearance feasibility of worksheet for learning style of somatic, auditory, visual, and intellectual are 81,48%, 86,11%, 88,57%, dan 83,33%.

DAFTAR PUSTAKA

1. Departemen Pendidikan Nasional. 2007. Pengembangan dan Pembelajaran SBI di SMP. Jakarta: Direktorat Jenderal Pendidikan Dasar dan Menengah Direktorat Pembinaan Sekolah Menengah Pertama.
2. Badan Standar Nasional Pendidikan.2006. Instrumen Penilaian Tahap II Buku Teks Pelajaran Kimia SMA/MA. Jakarta: BSNP.
3. Ibrahim, Muslimin. 2002. Pelatihan Terintegrasi Berbasis Kompetensi "Pengembangan Perangkat Pembelajaran". Jakarta: Direktorat Lanjutan Sekolah Tingkat Pertama.
4. Meier, Dave. Tanpa Tahun. The Accelerated Learning Handbook. Terjemahan oleh Rahmani Astuti. 2002. Mc-Graw Hill: New York.
5. Departemen Pendidikan Nasional. 2004. Pedoman Penyusunan Lembar Kegiatan Siswa dan Skenario Pembelajaran SMA. Jakarta: Direktorat Jenderal Pendidikan Dasar dan Menengah Direktorat Pendidikan Menengah Umum.
6. Nur, Mohammad. 1999. Teori-Teori Perkembangan. Surabaya: Universitas Negeri Surabaya.
7. Ibrahim, Muslimin. 2001. Model Pengembangan Perangkat Pembelajaran Menurut Jerold E. Kemp dan Thiagarajan. Surabaya: FMIPA.
8. Riduwan. 2010. Skala Pengukuran Variabel- variabel Penelitian. Bandung: Alfabeta.