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The Reconstruction Of Chemistry Curriculum Elements Of Vocational School For Nursing Skills Study Programs

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ABSTRACT

Chemical teaching materials don't support the learning of nursing vocational competencies, so it is necessary to analyze the suitability of chemical content with nursing vocational content. This research aims to reconstruct elements of the chemical curriculum relevant to the competence of nursing vocational schools. The research design used is Developmental Research with the stages of design, development, and evaluation. The research was conducted at SMK Nusa Bhakti Bandung and SMKN 1 Koto Besar (Dharmasraya Regency). The study involved two chemistry education experts, six nursing vocational teachers, and six chemistry teachers in nursing. The research instruments used are formulation formats in the form of KD, chemical content, knowledge dimensions, learning strategies, and learning evaluations that have been validated. The data of the research results was analyzed in a qualitative descriptive way then used as input for product improvement. The results showed that design of KD, chemical content, knowledge dimensions, learning strategies, and learning evaluation developed have good relevance to the demands of nursing vocational competencies. Viewed from the validation of teachers in nursing vocational schools obtained good validation results.

1. Introduction

Curriculum is the most important component in the education system. Curriculum changes are widely carried out by various countries, one of which is Indonesia with the aim of improving the quality of education. The purpose of curriculum changes is so that the implementation of education is in line with the development of the times and in accordance with the needs (Machali, 2014). In achieving educational goals, the curriculum is used as a reference in the implementation of learning activities related to goals, content, subject matter, methods to evaluation

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patterns (Permendikbud no. 70, 2013; Indriayu, 2012). In line with the times, the term curriculum undergoes a change in meaning, where the curriculum is not only interpreted as a set of learning that must be given and mastered by students, but more broadly as something that must be implemented in the learning process experienced by students and teachers (Wafi, 2017). In schools, the curriculum that has been set is described into a syllabus which is then poured in the form of a learning program plan (RPP).

Curriculum development can be categorized into Curriculum Knowledge. Curriculum Knowledge itself is basic knowledge that must be mastered by a professional teacher (Vos, Taconis, Jochems & Pilot, 2010). Curriculum Knowledge includes knowledge of the general objectives and characters of the curriculum, the curriculum of each subject, an understanding of the curriculum development of subjects in specialized fields including vocational, knowledge of what materials or content should be developed at a certain level in the educational program, as well as knowledge to describe the curriculum in learning design and learning resource materials (Chauvot, 2008; Coenders, et al., 2010; Chen & Wei, 2015). One form of particular of curriculum knowledge is the knowledge of the chemistry curriculum in the context of vocational schools. This knowledge plays an important role in the learning process due to differences in characteristics between public schools (SMA) and vocational schools. There are several related things including the characteristics of chemicals delivered, the purpose of chemical learning and differences in the characteristics of vocational education programs with general (Khasawneh, Olimat, Qablan & Abu-Tineh, 2008). Therefore, the need for knowledge about the development of curriculum because it can design an efficient and effective chemical learning interaction process based on the objectives of the curriculum.

Sourced from the curriculum structure of 2013 SMK/MAK level, the subjects of the interest group (C) are divided into C1 (basic subjects of the field of expertise), C2 (basic subjects of the expertise program), and C3 (subjects of competence of expertise). Based on (Perdirjen No. 07, 2018) chemistry subject in vocational school is studied in class X and classified into group C1 as basic subjects of the field of expertise along with biology and physic subjects. This is in line with (Wiyarsi, Hendayana, Firman & Anwar, 2015), stated chemistry is a collection of basic vocational subjects which means helping master the subject of expertise program so that students can utilize basic knowledge of chemistry in everyday life and as a guideline to develop abilities in every area of expertise.

In vocational school, chemistry subject is also grouped as adaptive subjects with the aim of realizing strong and broad science concepts in students to support the productive subjects of the skills program chosen by students. But in reality, it has not been realized chemistry subject as adaptive subjects to support students' competence in their areas of expertise (Lestari, 2015; Azizah, 2013). Chemical learning will become saturated, bored, and students assume that chemicals are not important because they contain too much learning materials that have nothing to do with the competence of their skills.

The importance of chemistry subject for health sciences. Where nursing chemistry should be different from other general chemistry, therefore the need for further attention to the chemical content in chemical learning studied at the time of vocational nursing. It takes chemical content that is truly relevant to the demands of vocational competence nursing expertise study program (Boddey & Berg, 2015). In line with research (Silfianah, 2015) mentioned that in the field of nursing there are various applications of basic chemistry, so chemistry subject must be supporting the nursing field expertise program. Nurses have a very important role such as restoring body temperature, electrolyte concentration and normal chemical composition, fluid volume, pH and proper nutrients. This shows that chemistry is very closely related to the nursing profession (James, Baker & Swain, 2008). Then nursing students must explore the complex processes contained in the patient's body. In the human body it consists of molecules, ions, and atoms that collect. Nursing students must know and explore the elements and compounds in the body as well as those needed by patients. Nursing students also need to understand acid bases, biomolecules, and chemical reactions (Cree & Sandra, 2006). Based on this, nursing students must really understand the concept of chemistry so that it can be implemented directly in the subjects of nursing expertise study program. Research also conducted by (El-Farargy, 2009) states that chemistry learning related to nursing vocational helps students associate chemical information with nursing applications so as to improve student achievement.

Vocational students must obtain selection and mapping of chemical content based on things that can be accounted for and logical. Adjustments between chemical content and vocational contexts are indispensable. Based on the current curriculum, where the scope of chemistry subject in vocational fields is almost the same. That is, chemistry subject in one area of expertise in vocational school have the same competencies, even though each competency of expertise has a variety of productive program materials. Therefore, the need to select and determine the relevant chemical content to the needs of vocational competence of students because the integrated chemical learning of vocational contexts has an impact on increasing students' interest in learning, and will be realized a meaningful learning process (Wiyarsi, Ikhsan & Sukisman, 2017).

Recently, vocational high schools were involved to continuously assess programs, content, implementation, in order to update the curriculum. Vocational High Schools need to integrate theoretical materials or practice materials with existing competencies. Vocational education must be able to teach competencies to meet the needs of graduates in the future by looking at real factors in the field and creating innovation (Jatmoko, 2013).

This research analyzes the research results with the aim of knowing the validity by the teachers regarding design of KD, chemical content, knowledge dimensions, learning strategies, and evaluations developed by researchers, whether it has good relevance or not to the demands of vocational competence nursing expertise study program.

2. Methodology

The design in this research is Developmental Research where the stages are design, development, and evaluation (Richey & Klein, 2005). The study involved two chemistry education experts and teachers as respondents consisting of six nursing vocational subject teachers and six chemistry subject teachers in nursing who came from SMK Nusa Bhakti Bandung and SMKN 1 Koto Besar (Dharmasraya Regency). The research instruments used are formulation formats in the form of KD, chemical content, knowledge dimensions, learning strategies, and evaluations in accordance with the demands of vocational competence nursing expertise study program. The data of the research results was analyzed in a qualitative descriptive way and then used as input for product improvement, the stages as follows data reduction, data presentation, and conclusion (Sugiyono, 2016).

3. Results and Discussion

The following results of the formulation of basic competencies and chemical content relevant to vocational competence are summarized in Table 1.

Table 1. Results of Formulation of Basic Competencies and Chemical Content That Are Considered Relevant to the Basic Competencies of Nursing Vocational Expertise Study Program

Vocational Subjects	Basic Competencies of Chemistry Developed	Chemical Content
AF (Kim 1)	<ul style="list-style-type: none"> Describes the elements and compounds that building human body (muscle and bone systems, respiratory system, digestive system, germination system). Analyze the function of the elements and compounds that building human body (muscle and bone systems, respiratory system, digestive system, germination system). 	Elements and compounds that building human body and its functions
(Kim 2)	<ul style="list-style-type: none"> Distinguishing the types of chemical reactions that occur in the human body (metabolism of the respiratory system and digestive system) 	Chemical reactions in the human body
(Kim 3)	<ul style="list-style-type: none"> Explain the concept of respiration rate and digestive rate in the human body. Describes the factors that affect the rate of respiration and the rate of digestion in the human body. 	Rate of respiration and rate of digestion and factors
KDTK (Kim 4)	<ul style="list-style-type: none"> Identify disinfectants used to clean medical equipment. Analyze the physical and chemical properties of disinfecting health equipment. Analyze the function of disinfectants as a health equipment cleaner. 	Physical properties and chemical properties of compounds in disinfectants of health equipment and their functions
(Kim 5)	<ul style="list-style-type: none"> Describes the concept of solution in the manufacture of disinfectants. 	The concept of solution, unit

	<ul style="list-style-type: none"> • Describes the unit of concentration of the solution. • Making disinfectant solution with a certain concentration in accordance with the standard procedure. 	concentration of solution, and making solutions
(Kim 6)	<ul style="list-style-type: none"> • Identify chemical compounds as sterilization of medical equipment. • Analyze the physical and chemical properties of chemical compounds sterilizing health equipment. • Analyze the function of chemical compounds sterilizing of health equipment. 	Physical properties and chemical properties of compounds in the sterile of health equipment and their functions
(Kim 7)	<ul style="list-style-type: none"> • Identify chemical compounds found in intravenous fluids. • Analyze the physical and chemical properties of compounds in intravenous fluids. • Analyze the function of chemical compounds in intravenous fluids. 	Physical properties and chemical properties of compounds in infusion fluids and their functions
(Kim 8)	<ul style="list-style-type: none"> • Identify chemical compounds used in the treatment of basic wounds (wound medicine). • Analyze the physical and chemical properties of chemical compounds used in the treatment of basic wounds (wound medicine). • Analyze the function of chemical compounds used in the treatment of basic wounds (wound medicine). 	Physical properties and chemical properties of compounds in wound care (wound medicine) and their function
KDM (Kim 9)	<ul style="list-style-type: none"> • Define electrolyte solution and nonelectrolyte solution • Identify the properties of electrolyte and nonelectrolyte solutions in human body fluids. • Analyze the function of electrolyte and nonelectrolyte solutions in body fluids. 	Electrolyte and nonelectrolyte solutions
(Kim 10)	<ul style="list-style-type: none"> • Explains the theory of acids and bases (Arrhenius, Bronsted-Lowry, Lewis). • Identify acid, base, and salt solutions in body fluids. • Explain the meaning of buffer solution. • Describes the composition and properties of the buffer solution. • Describes the role of buffer solutions in blood, saliva, breathing and kidneys in the human body. 	Acid base theory, Buffer solution
(Kim 11)	<ul style="list-style-type: none"> • Identify chemicals as a source of oxygenation needs. • Describes the chemical reactions that occur in oxygenation. 	Chemicals as a source of oxygenation needs
(Kim 12)	<ul style="list-style-type: none"> • Identify several chemical compounds with systematic and trivial names used in anti-inflammatory drugs, anti-infective drugs, anti-tuberculosis drugs, antifungi drugs, antiviral drugs, digestive system disorder drugs, germination system disorder drugs, heart drugs, respiratory tract drugs, anticoagulation drugs, antihistamine drugs, psychotropics. 	Physical properties and chemical properties of compounds in drugs and their functions

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- Analyze the physical and chemical properties of several chemical compounds used in anti-inflammatory drugs, anti-infective drugs, anti-tuberculosis drugs, antifungi drugs, antiviral drugs, digestive system disorder drugs, germination system disorder drugs, heart drugs, respiratory tract drugs, anticoagulation drugs, antihistamine drugs, psychotropics.
 - Analyze the function of chemical compounds contained in anti-inflammatory drugs, anti-infective drugs, anti-tuberculosis drugs, antifungi drugs, antiviral drugs, digestive system disorder drugs, germination system disorder drugs, heart drugs, respiratory tract drugs, anticoagulation drugs, antihistamine drugs, psychotropics.
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3.1 The Basic Competencies of Chemistry Relevant to The Basic Competencies of Nursing Vocational Expertise Study Program

Basic competencies are knowledge, skills, and attitudes that students must master at least to demonstrate that students have mastered established competency standards (Abdul, 2014). Data on the basic competence of vocational subjects can be obtained from the syllabus of SMK Curriculum 2013 revision 2017 or according to the annex of Perdirjen No. 464/D.D5/KR/2018 on Core Competence (KI) and Basic Competence (KD) subjects in SMK/MAK. The data becomes a reference to analyze and map basic competencies of chemistry in accordance with the demands of KD SMK of nursing expertise study program. Based on Table 1, it is seen the relevance of KD chemistry with KD SMK of nursing expertise study program. It is also seen that nursing vocational subjects are relevant to basic competencies of chemistry such as AF (Anatomi Fisiologi), KDTK (Keterampilan Dasar Tindakan Keperawatan), and KDM (Kebutuhan Dasar Manusia). In determining the basic competencies of chemistry developed is based on the formulation of operational verbs that are in accordance with the level of knowledge and skill level, including defining, explaining, distinguishing, describing, identifying, analyzing, and making disinfectant solutions. In addition, the way researchers relevance the KD (Basic Competence) chemistry developed with KD (Basic Competence) SMK nursing expertise study program is to look at important information related to vocational materials containing concepts/facts/phenomena to achieve KD of nursing vocational and provide an overview of chemical materials contained in nursing print teaching materials modules and vocational print books.

In the formulation of basic competencies of chemistry developed, researchers follow the conditions in formulating a good KD according to (Syah, 2007), including: (1) the formulation of goals made must be student-centered, referring to changes in the behavior of learning subjects, namely students, (2) KD formulations must reflect operational behavior that is observable and measured formulated using operational words, and (3) the formulation of KD must contain the meaning of the subject matter that will be taught at the time of teaching and learning activities.

To find out the percentage of relevance of basic competencies of chemistry with the basic competencies of nursing vocational expertise study program can be detailed in Table 2.

Table 2. Percentage of Basic Competencies of Chemistry Relevant to Basic Competencies of Nursing Vocational Expertise Study Program

Vocational Subjects	Number of Basic Competencies	Number of KD of Chemistry Relevant to KD SMK	Percentage (%)
AF	13	3	4
KDTK	40	5	7
KDM	18	6	8
Total	71	14	19

Based on Table 2, the percentage of relevance of basic competencies of chemistry with the basic competence of nursing vocational expertise study program is only 19%. Although the percentage obtained is very small, it still needs to be supported optimally so that basic competencies of chemistry can really support the productive subjects of nursing vocational expertise study program.

The results of validation by respondents on the formulation of the relevance of basic competencies of chemistry with the basic competencies of nursing vocational expertise study program, overall both chemistry teachers and nursing subject teachers agree on the results of the relevance of basic competencies of chemistry developed with basic vocational competence of nursing. Suggestions or notes provided by respondents can be seen in Table 3.

Table 3. Suggestions or Notes of Formulation of Basic Competencies of Chemistry Developed

KD of Chemistry	Suggestions/Notes	
	Nursing Teacher	Chemistry Teacher
Kim 1	Teacher Kep4 : More to the elements O ₂ and CO ₂ , not the respiratory system	-
Kim 6	-	Teacher K5: It is necessary to sterilize health equipment.
Kim 12	-	Teacher K2: KD in column 5 is too deep for chemistry subject matter (too difficult)

The suggestions given by respondents on the basic competencies of chemistry developed can be concluded that basic competencies of chemistry do have a relationship with the basic competence of nursing vocational but there are some materials that do not need to be studied in depth. From the suggestions of respondents can be used as a consideration in product improvement to obtain a basic competencies of chemistry design that is relevant to vocational to be better.

3.2 Chemical Content Relevant to the Demands of Nursing Vocational Competence Expertise Study Program

Based on Table 1, it looks at the formulation of chemical content relevant to the demands of nursing vocational competence expertise study program. In formulating this relevant chemical content it is based on basic competencies of chemistry that have been developed previously by researchers. This is in line with (Wiyarsi, Hendayana, Firman & Anwar, 2015) which states that the ability to analyze basic competencies of chemistry relevant to basic competencies of vocational is needed because based on the results of the analysis can map the relevant chemical contents to be taught in vocational school, thus chemical learning will be more meaningful in accordance with the vocational competence of students.

The selection and mapping of chemical content provided to vocational students must certainly be based on a rationale that can be accounted for. Where the selection of chemical content for vocational students nursing expertise program is not the same as the selection of chemical content for vocational students dental assistant expertise program, medical laboratory technology, and pharmacy. Although these programs are both in one area of expertise, namely the field of health. The chemical content needs of each expertise program vary in supporting their respective competencies. Thus, it is important to choose and determine the relevant chemical content to the demands of nursing vocational competence expertise program (Wiyarsi, Ikhsan & Sukisman, 2017).

To find out the percentage of results of the formulation of chemical content relevant to the demands of nursing vocational competence expertise study program, researchers present it in a circle diagram in Figure 1.

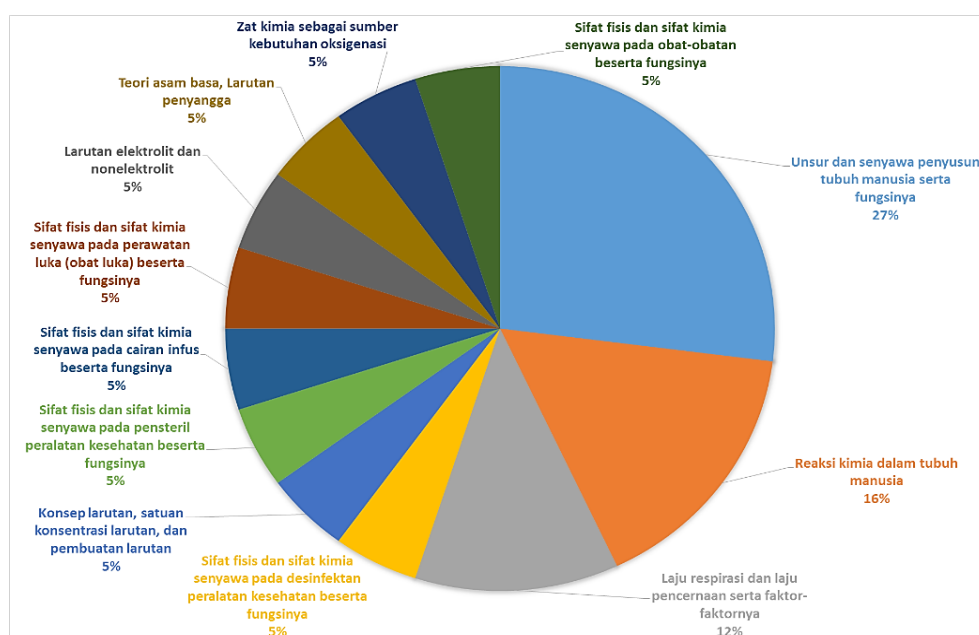


Figure 1. Diagram of Chemical Content Composition Relevant to the Demands of Nursing Vocational Competence Expertise Study Program

The results of validation by respondents on the formulation of chemical content relevant to the demands of nursing vocational competence expertise study program, overall both chemistry teachers and nursing subject teachers agree on the results of the relevance of chemical content formulated from the analysis of basic competencies of chemistry developed previously by researchers. Suggestions or notes provided by respondents can be seen in Table 4.

Table 4. Suggestions or Notes of Formulation of Chemical Content Relevant to the Demands of Nursing Vocational Competence Expertise Study Program




Chemical Content Developed	Suggestions/Notes	
	Nursing Teacher	Chemistry Teacher
<ul style="list-style-type: none"> • Acid and base theory (Arrhenius, Bronsted-Lowry, Lewis) • Acid, base, and salt solutions in body fluids 	-	Teacher K2: Chemical content add solution pH

3.3 Dimensions of Knowledge on Chemical Content Relevant to the Demands of Nursing Vocational Competence Expertise Study Program

Researchers formulated this dimension of knowledge on chemical content based on Bloom Anderson and Krathwohl's Taxonomy (2010) namely factual, conceptual, procedural, and metacognitive. Factual knowledge includes basic elements of labels, symbols (verbal and nonverbal) relating to some solid references, which convey detailed and specific information. Factual dimensions are formulated based on the realities that can be found in everyday life with regard to the field of chemistry in nursing. Conceptual knowledge includes knowledge of categories, classifications, principles, generalizations, and theories related to a particular problem. The conceptual dimension is formulated in the form of essential concepts related to the field of chemistry in nursing. Procedural knowledge is a series of steps that must be followed. It is about knowledge using the skills, calculations, techniques, and methods collectively referred to as procedures. The procedural dimension is formulated in the form of steps related to the application of chemistry in the field of nursing science. Metacognitive knowledge involves thinking about one's own thought processes such as learning skills, memory skills, and the ability to filter out learning. The metacognitive dimension is formulated in the form of knowledge with keywords that are easy for students to remember and can increase awareness of thinking related to the field of chemistry in nursing.

The results of validation by respondents about the formulation of the dimension of knowledge on chemical content relevant to the demands of nursing vocational competence expertise study program, overall both chemistry teachers and nursing subject teachers agree on the results of the formulation of the dimension of knowledge. Suggestions or notes provided by respondents can be seen in Table 5.

Table 5. Suggestions or Notes on The Formulation of Knowledge Dimensions on Chemical Content Relevant to Nursing Vocational

Chemical Content	Dimensions of Knowledge	Suggestions/Notes	
		Nursing Teacher	Chemistry Teacher
<ul style="list-style-type: none"> Elements and compounds that building human body and its functions 	Factual Element  <p>Figure 1. Iron (Fe) Source : https://id.wikipedia.org/</p>	Teacher Kep2: For basic competence of chemistry is in the learning materials of IKM (Ilmu Kesehatan Masyarakat). In nutrition science materials explain about examples of elements, compounds and mixtures. With the example of water compounds (H ₂ O), salt (NaCl).	-
	Compound  <p>Figure 2. Water (H₂O) and salt (NaCl) Source : https://www.google.com/</p>		
	Mixture  <p>Figure 3. Coffee drinks Source: https://food.detik.com/</p>		
	Conceptual <ul style="list-style-type: none"> An element is a pure substance that cannot be chemically decomposed into another substance. A compound is a pure substance containing two or more elements joined in a fixed mass ratio. 	Teacher Kep2: Not explaining until this section	-
<ul style="list-style-type: none"> Chemical reactions in the human body 	Conceptual <ul style="list-style-type: none"> Chemical reaction is an event of combining a reagent or reactant substance to produce a product as a result of a reaction. 	Teacher Kep3: Just explain the metabolic process	-

	<ul style="list-style-type: none"> • Metabolism is a complex chemical process that occurs in cells used for energy, cell growth and repair. • Combustion reactions are reactions of elements and compounds with oxygen. • A hydrolysis reaction is the decomposition of substances in a chemical reaction caused by water. 		
	Procedural The steps in writing down chemical reactions on the metabolism of the respiratory and respiratory systems.	Teacher Kep2: The school has not given or taught to students.	Teacher K2: Metabolic reactions in digestion there are terms of hydrolysis reactions, carbohydrates, fats that have not previously been studied.
	Metacognitive Chemical reactions that occur in the human body are assisted by enzymes (enzymatic reactions) that play a role in accelerating a chemical reaction.	Teacher Kep5: Nothing in the learning material	-
<ul style="list-style-type: none"> • The concept of solution, unit concentration of solution, and making solutions 	Procedural The steps in making a disinfectant solution with a certain concentration according to the procedure.	Teacher Kep2: Does not provide material about the steps in making a disinfectant solution	-
<ul style="list-style-type: none"> • Buffer solution in the human body • pH of buffer solution on the human body 	Procedural Steps to measure the pH of a buffer solution in human body fluids	Teacher Kep2: Does not provide material about measuring the pH of buffer solutions in human body fluids	-

The notes or suggestions that the teacher gives is that the kep2 teacher explained that it is not disapproving of the instrument only that the school has not given or taught to students. From the suggestion of respondents can be used as a consideration in product improvement to obtain the formulation of the dimension of knowledge on chemical content in accordance with the demands of vocational competence nursing expertise study program to be better.

3.4 Learning Strategies That Can Be Applied in Chemical Learning in Nursing Vocational Expertise Study Program

Broadly expressed in the formulation of learning design which not only formulates learning strategies, but also formulates learning experiences and learning resources. The formulation of learning experiences reveals about opportunities for independent learning activities by students, learning opportunities with fellow friends, and opportunities for learning activities according to the material taught for the classroom or in the laboratory. The formulation of learning resources can be books, modules, journals, and web addresses that contain the material being studied. The formulation of learning strategies contains learning approaches, learning models and their syntax that are adapted to the chemical content relevant to the competence of vocational nursing expertise study program. The learning approaches and models implemented in the 2013 curriculum want students to be able to learn independently and learn student-centered, no longer in teachers. In this study, researchers formulated several learning strategies on chemical content relevant to the competence of nursing vocational expertise study program, namely scientific approaches with learning models such as guided inquiry, discovery learning, and project based learning (PjBL).

The results of validation by respondents regarding the formulation of chemistry learning design nursing vocational expertise study program, both chemistry teachers and nursing subject teachers agree the overall results of the formulation of learning design (learning experience, learning resources, and learning strategies). There is a note or suggestion that the teacher gives that the kep2 teacher mentions that it is not disapproving of the instrument just that the school has not given or taught to students. Overall, the formulation of learning design (learning experience, learning resources, and learning strategies) has good validity and can be applied to chemical learning for vocational students nursing expertise study program.

3.5 Evaluation of Learning That Can Be Applied in Chemical Learning in Nursing Vocational Expertise Study Program

Broadly expressed, the evaluation of learning is also expressed in the formulation of learning design. The formulation of learning evaluation contains about assessment in the cognitive realm, skill realm and attitude realm towards the integrated chemical content of nursing vocational expertise study program. The formulation of cognitive evaluation reveals the type and form of assessment applied in the form of competence and knowledge related to the material tested. The formulation of the evaluation of the skill realm reveals the type and form of assessment applied in the form of what skills related to the material to be tested. And the formulation of learning evaluation for the realm of attitude reveals the type and form of assessment applied in the form of what attitudes will be tested related to the material in question. Assessment in the cognitive realm (competence of knowledge) consists of written tests and assignments. Assessment in the realm of skills consists of practicum performance assessment, practicum report

assessment, and product assessment. While the assessment in the realm of attitude consists of observation of attitudes towards students during the learning process, such as attitudes of curiosity, communicativeness, responsibility, and cooperation.

The results of validation by respondents regarding the formulation of the evaluation of chemistry learning vocational nursing expertise study program, both chemistry teachers and nursing subject teachers agreed on the overall results of the evaluation formulation. There is a note or suggestion that the teacher gives that the ke2 teacher mentions that it is not disapproving of the instrument just that the school has not given or taught to students. Overall, the formulation of learning evaluation has good validity and can be applied to chemical learning for vocational students nursing expertise study program.

4. Conclusion

Based on the description of research results and discussions, researchers concluded that the formulation of KD, chemical content, knowledge dimensions, learning strategies, and learning evaluation developed have good relevance to the demands of nursing vocational competence expertise study program. This is reviewed from teachers in nursing vocational agreeing the results of the formulation of basic competencies (KD), chemical content, knowledge dimensions, learning strategies, and learning evaluation so that it has good validity and can be applied to chemical learning for nursing vocational students expertise study program.

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References

- Abdul, M. (2014). *Implementasi Kurikulum 2013: Kajian Teoretis dan Praktis*. Bandung: Interes Media.
- Anderson, L. W., & Krathwohl, D. R. (2010). *Kerangka Landasan Untuk Pembelajaran, Pengajaran, Dan Asesmen*. Yogyakarta: Pustaka Pelajar.
- Azizah, D. A. (2013). *Pola Pengintegrasian Mata Pelajaran Adaptif Kimia Smk Pelayaran* (Doctoral dissertation, Universitas Pendidikan Indonesia).
- Boddey, K., & de Berg, K. (2015). The impact of nursing students' prior chemistry experience on academic performance and perception of relevance in a health science course. *Chemistry Education Research and Practice*, 16(2), 212-227.
- Chauvot, J. B. (2008). Curricular Knowledge and the Work of Mathematics Teacher Educators. *Issues in Teacher Education*, 17(2), 83-99.
-

-
- Chen, B., & Wei, B. (2015). Examining chemistry teachers' use of curriculum materials: in view of teachers' pedagogical content knowledge. *Chemistry Education Research and Practice*, 16(2), 260-272.
- Coenders, F., Terlouw, C., Dijkstra, S., & Pieters, J. (2010). The effects of the design and development of a chemistry curriculum reform on teachers' professional growth: A case study. *Journal of science teacher education*, 21(5), 535-557.
- Cree, L., & Sandra, R. (2006). *Sains Dalam Keperawatan: Fisika, Kimia, Biologi*. Jakarta: EGC.
- El-Faragy, N. (2009). Chemistry for student nurses: applications-based learning. *Chemistry Education Research and Practice*, 10(3), 250-260.
- Indriayu, M. (2012). Implementasi Kurikulum Tingkat Satuan Pendidikan (Ktsp) Sebagai Upaya Meningkatkan Ketuntasan Belajar. *Jurnal Inovasi Pendidikan*, 10(1).
- James, J., Baker, C., & Swain, H. (2008). *Prinsip-Prinsip Sains untuk Keperawatan*. Jakarta: Erlangga Medical Series.
- Jatmoko, D. (2013). Relevansi kurikulum SMK kompetensi keahlian teknik kendaraan ringan terhadap kebutuhan dunia industri di Kabupaten Sleman. *Jurnal Pendidikan Vokasi*, 3(1).
- Khasawneh, S. A., Olimat, M. M., Qablan, A. M., & Abu-Tineh, A. M. (2008). Measuring the perceptions of vocational education students regarding the application of National Vocational Teacher Standards in the university classrooms: The key to human resource education in Jordan. *International Journal of Applied Educational Studies*, 2(1), 24.
- Lestari, D. R. (2015). *Restrukturisasi Kurikulum Kimia Di Sekolah Menengah Kejuruan (Smk) Program Studi Keahlian Teknologi Pesawat Udara* (Doctoral dissertation, Universitas Pendidikan Indonesia).
- Machali, I. (2014). Kebijakan perubahan kurikulum 2013 dalam menyongsong Indonesia emas tahun 2045. *Jurnal Pendidikan Islam*, 3(1), 71-94.
- Permendikbud. (2013). *Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 70 Tahun 2013 tentang Kerangka Dasar dan Struktur Kurikulum Sekolah Menengah Kejuruan/Madrasah Aliyah Kejuruan*. Jakarta: Menteri Pendidikan dan Kebudayaan Republik Indonesia.
- Perdirjen Dikdasmen (2018). *Peraturan Direktur Jenderal Pendidikan Dasar dan Menengah Nomor: 07/D.D5/KK/2018 tentang Struktur Kurikulum Sekolah Menengah Kejuruan (SMK)/Madrasah Aliyah Kejuruan (MAK)*. Jakarta: Kementerian Pendidikan dan Kebudayaan.
- Perdirjen Dikdasmen (2018). *Lampiran Keputusan Direktur Jenderal Pendidikan Dasar dan Menengah Nomor: 464/D.D5/KR/2018 tentang Kompetensi Inti dan Kompetensi Dasar Mata Pelajaran Muatan Nasional (A), Muatan Kewilayahan (B), Dasar Bidang Keahlian (C1), Dasar Program Keahlian (C2), Dan Kompetensi Keahlian (C3)*. Jakarta: Kementerian Pendidikan dan Kebudayaan.
- Richey, R. C., & Klein, J. D. (2005). Developmental research methods: Creating knowledge from instructional design and development practice. *Journal of Computing in higher Education*, 16(2), 23-38.
- Silfianah, I. (2015). *Pengembangan Bahan Ajar Kimia Untuk Siswa Smk Bidang Keahlian Kesehatan Program Keahlian Keperawatan Melalui Four Steps*
-

- Teaching Material Development* (Doctoral dissertation, Universitas Pendidikan Indonesia).
- Sugiyono. (2016). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.
- Syah, D. (2007). *Perencanaan Sistem Pengajaran Pendidikan Agama Islam*. Jakarta: Gaung Persada Press.
- Vos, M. A., Taconis, R., Jochems, W. M., & Pilot, A. (2010). Teachers implementing context-based teaching materials: A framework for case-analysis in chemistry. *Chemistry Education Research and Practice*, 11(3), 193-206.
- Wafi, A. (2017). Konsep dasar Kurikulum Pendidikan Agama Islam. *EDURELIGIA: Jurnal Pendidikan Agama Islam*, 1(2), 133-139.
- Wiyarsi, A., Hendayana, S., Firman, H., & Anwar, S. (2015). Pengembangan Curriculum Knowledge Calon Guru Melalui Analisis Konten Kimia Konteks Kejuruan. *Jurnal Pendidikan Matematika dan Sains*, 3(1), 30-38.
- Wiyarsi, A., Ikhsan, J., & Sukisman, S. (2017). Pelatihan Pengembangan Pembelajaran Kimia Terintegrasi Konteks Kejuruan Untuk Meningkatkan Profesionalisme Guru SMK di DIY. *Jurnal Pengabdian Masyarakat MIPA dan Pendidikan MIPA*, 1(2), 70-76.

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