



Analysis of Curriculum for Science Education for Students with Special Needs in Vocational High Schools

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Abstract: The curriculum is a tool to achieve national goals, making it as a reference in formulating goals in the learning process that must be achieved by each student. Each student has different needs in the learning process due to its different potentialities. Different from general students, students with special needs (SSNs) are students who need special education and services in the learning process especially in science learning. The science education curriculum for SSNs is important to be understood because all students need to get the same goal to achieve the national goals in the curriculum. However, SSNs had limitations and problems to achieve the goals, especially comparing to general students. Therefore, the purpose of this study was to determine the curriculum in vocational high schools on science education for SSNs. Data on the national curriculum for science subject at the culinary vocational school were identified and investigated. Culinary Study was the main focus since most SSNs take this major. The results showed that the science education curriculum used for SSNs was the same as general students. From this perspective, this study can conclude that to achieve learning goals in teaching SSNs, most educators must apply individual learning programs. The material in the curriculum taught is the same, but the approaches, strategies, methods, and media must be reconstructed and adapted to the needs of SSNs. Some teachers should make curriculum modifications, known as a differentiated curriculum. This research is expected to become knowledge for vocational schools that accept SSNs, and this study can be an alternative in making a differentiated curriculum for students, making it as one of the solutions in teaching general students and SSNs.

Keywords: Curriculum, education, science education, students with special needs, vocational high school

1. Introduction

Vocational school is one of the schools that aiming to produce 'ready-industry students' (Rosina et al., 2021) and is expected to immediately get hired upon graduation (Chuntala, 2019). Students are nurtured to have special skills in the specific field, which can deliver them to be able to directly enter industries. This makes the curriculum for vocational school unique compared to high school. The vocational school mostly is fulfilled by practicum (Ana, 2020; Handayani, Ali, & Mukhidin, 2020a; Handayani, Ali, & Mukhidin, 2020b).

One of the vocational school departments is the culinary vocational school (known as SMK Tataboga in Indonesia). This culinary vocational school is one of the most favorites schools for students with special needs (SSNs). That is the main reason why the Indonesian government plans, especially for the West Java government, and launches this type of vocational school as one of the inclusive vocational schools in West Java, Indonesia. Most students are prepared for having skills in culinary (Karyantoa, 2021). These culinary skills need to be developed. Thus, SSNs can be prepared to enter the industries.

Many papers discussed several curriculums and how to improve them to be able for a specific reason (Kusumawati, 2019; Widiaty et al., 2020; Rosina et al., 2021; Maryanti et al., 2021; Al-Obaidi, 2021). One of the needed curriculums is for designing it for SSN. The focuses of the current trend of papers more on seeking teacher's views in the development of special education curriculum (Sutjipto, 2018), policy, implementation, and strategic issues of education for individuals with special needs (Morina, 2017), 2014), model of instructional strategy based on the brain's natural learning system in inclusive classrooms from special teacher perceptions. (Widyasary, 2020), curriculum for SSN (Marani, 2017), and curriculum management of Islamic religious education for SSN (Wahyuni, 2019). However, only a few research that discussed the concept of science education in the curriculum in the vocational school for SSNs. Although the ways how to teach students with special needs have been reported (Abidi, Rochyadi, & Sutriani, 2021; Sumitra, 2021; Soetan et al., 2021), there is a vague understanding amongst researchers on the strategies for understanding the curriculum itself in detail. In fact, curriculum plays an important role in changing strategies in teaching and learning.

The novelty of this study was the research objective, focusing on the science education in the national curriculum for SSN in vocational high schools in the field of culinary. SSNs are students who are having problems in both personal development and academic engagement, resulting in them requiring special education and services (Ref.). Thus, the curriculum must be different from normal students, or it can adapt some specific factors according to the requirements of SSN (Maryanti et al., 2021). SSN should have equal access to education, but only a few institutions are ready to fulfill the demand. For that reason, Vocational high school with the culinary subject is one alternative to develop their potential in certain fields.

The objective of this study was to determine and analyze the national curriculum on science education in vocational schools, especially in the culinary field, to deal with the requirements of SSN. In this study, we analyzed the curriculum and comparing the content in the national current curriculum for general students and SSN in Indonesia. The results showed that the curriculum used for SSN in vocational high school is the same in terms of basic competencies and core competencies. The implication, it is expected to become a new knowledge contribution for schools to welcome SSN, as well as to give an alternative idea in providing a special curriculum for them.

2. Theoretical Explanation

2.1 Vocational High School Curriculum in Indonesia

Indonesia currently uses the Indonesian 2013 curriculum (Octavianda, Rustaman, & Sriyati, 2015). This curriculum prioritizes students to think critically and be able to apply their knowledge in daily life. The government makes revisions every year. Currently, the 2013 curriculum has been revised in 2018, and it is agreeing to the latest Ministry of Education and Culture regulations. Part of the curriculum in Indonesia is inseparable from two components, known as core (known as KI) and basic competencies (known as KD) (Zuhaida, 2019).

Core competence is the level of students' ability to get standard competencies, in which graduated students must have in each grade level or program to form the basis for the development of basic knowledge. Standard competencies for graduates include several aspects: attitudes, knowledge, and skills (Prihantoro, 2015). Core Competencies must describe the quality that is balanced between the achievement of hard and soft skills. In facilitating its competencies, core competencies in the realm of attitude are divided into two aspects: spiritual and social attitudes. Spiritual attitude relates to the goal of national education to form students who are faithful and pious (Prihantono, 2015). Social attitude relates to the goal of national education to form students who have a noble character, independent and responsible, and having democratic ideas. This sorting in the domain of attitudes is an important factor that distinguishes the 2013 curriculum (Prihantoro, 2015). The core competencies include four dimensions (Prihantoro, 2015): (1) spiritual attitudes; (2) social attitudes; (3) knowledge; (4) and skills. The four dimensions are designed to integrate learning content, subjects, or programs in achieving standard competencies. Competencies related to religious and social attitudes are developed indirectly (indirect teaching), namely when students learn about knowledge (group competence 3) and the application of knowledge or skills (core competence group 4)

Basic competence is the ability to achieve core competency that must be obtained by students through learning (Maryanti et al., 2021). Understanding basic competency is important since it gives the competence of each subject for each class, which is derived from the core competency. Basic competency contains several abilities that must be mastered by students in certain subjects, as a reference for compiling competency indicators in a lesson. In each formulation of basic competence, there is an element of thinking ability, which is expressed in verbs and teaching materials. Basic competency contains attitudes, knowledge, and skills that are sourced from core competency. These competencies are made and developed by considering the characteristics of students and their initial abilities.

Subjects as a source of content to master competencies are open. In reviewing the basic competency of subjects, it is necessary to pay attention to the following points: (1) The order is based on the hierarchy of concepts of disciplines or the level of difficulties of the teaching material; (2) The relationship between core and basic competencies “in subjects content”; (3) The relationship between core and basic competencies “for every subject”, as well as its relationship with subjects (Prihantoro, 2015).

The objectives in the curriculum include four aspects of competencies (Solikhah & Budiharso, 2019): (1) spiritual attitude competence, (2) social attitudes, (3) knowledge, and (4) skills. These aspects of competence are obtained through intra-curricular, co-curricular, and extra-curricular learning processes. Table 1 shows the curriculum for science subjects in culinary expertise. The curriculum includes core competencies and basic competencies which include knowledge and skills.

2.2 Students with Special Needs

SSNs have obstacles and problems in the internal and external factors. These factors have impacts on the need in the teaching and learning process. SSN are classified by permanent and temporary special needs (Al-Rowaily et al., 2012). Students with permanent special needs include:

- a. Visual impairment (blind) (Giagazoglou et al., 2013). Children with visual impairments require special education services in their education and life. Children with visual impairment are divided into two categories, namely low vision children and blind children. They are optimizing the auditory function in the learning process.
- b. Hearing impairment (deaf) (Reinehr et al., 2010). Children with hearing impairments experience verbal communication disorders. They have difficulties in understanding complex and abstract information. They are visual learning students because they optimize their visual senses in the learning process.
- c. Intellectual disabilities (Oliver & Reschly, 2010). Children with intellectual disabilities have intelligence below average (IQ less than 70), have problems in adaptive behavior, and occur at a developmental age. These characteristics make it difficult for them to complete tasks in everyday life, especially in the learning process. They have a hard time understanding things that are complex, abstract, and they don't like.
- d. Limb/physical barriers (Johnson et al., 2010). Children with limb / physical barriers have permanent abnormalities or disabilities in their limbs or neurological disorders of movement in the brain.
- e. Emotional and behavioral disorders (Charman et al., 2010). This type of child shows deviant behavior at moderate, severe, or very severe levels that occur at the age of children and adolescents because of disruption of emotional and social development.
- f. Specific learning disorders (Keown, 2012). Children with specific learning disorders are children who have problems in the learning process caused by basic psychological disorders, central nervous system dysfunction, and or neurological disorders.
- g. Autism (Maryanti et al., 2021). Autistic children are children who experience disturbances in interaction, communication, and social behavior. They are known to be more preoccupied with their own world. Problems occur because of problems in neurological dysfunction in children.
- h. Children Attention Deficit and Hyperactive Disorder (ADHD) (Maryanti et al., 2021). Children with ADHD have trouble concentrating and hyperactive behavior.

Every child classified as SSN has different developments, learning barriers, and requirements. Several factors in the learning barriers experienced by SSN are (1) environmental factors; (2) factors within the child itself, and (2) a combination of the two factors.

2.3 Science Education for Students with Special Needs

Science is the study of events occurring in the world that require logical observation and understanding. Science is defined as all knowledge obtained through the scientific method. Science is the result of coordination, structure, and systematic research on natural events carried out by scientists (Nurrudin, 2018). Science education is an effort to teach science in an educational environment. Science education is important to be taught because it is closely related to phenomena that occur in daily life (Suherman et al., 2021).

The main ideas why science education must be implemented in the curriculum is because of several reasons:

- (i) Science relates to the competition to be the leading in several aspects (Hashim et al., 2020). Someone that has the latest and most advanced technological advances can rule the world. For that reason, countries include science lessons as the main lesson to compete with other countries, especially creating graduate students that can compete in industries.
- (ii) Science is another branch of the subject that is the most needed component. Understanding science will make students easy to continue studying in other disciplines. Science also allows students to be more logical, applying what they get during school and combining it with other disciplines, such as agriculture and even medicine. Science also can bear more creation in combining what students get to some aspects in sociology, climatology, medicine, robotics, computers, astronomy, agriculture, animal husbandry, fisheries, forestry, and others. Indeed,

- in culinary vocational school, science is important, specifically for preparing food in some conditions, related to the raw materials available, climate condition, social and consumer condition, etc.
- (iii) Understanding science can make it easier in non-science lessons. Science can make the way of thinking students to be more logical and open. Indeed, it will help in entering the non-science world, such as economics. People who study economics need science skills, namely basic mathematics. Without science, economics would not be economics because it cannot learn without counting.
 - (iv) Science can educate people, improving the way how to survive in their life. Science also can educate and predict problems, such as counting plant harvesting, recovering some problems, etc.

Because science is given a very high portion, science becomes the most important subject and must be fulfilled in school. In Indonesia, evidence of regulations can be found in the Indonesian Constitution 31 paragraph 5 which reads "The government advances science and technology by upholding religious values and national unity for the advancement of civilization and the welfare of mankind". Then, it is also written in the Indonesian Preamble of the 1945 Constitution which reads "Then from that to form an Indonesian State Government that protects the entire Indonesian nation and the entire homeland of Indonesia and to promote public welfare, educate the nation's life, and participate in carrying out world order based on freedom, eternal peace, and justice. social,"

In the curriculum in vocational high schools, science education is one of the subject clusters that must be mastered by students. Science education is one of the foundations or provisions for students in understanding the next learning material (Hidayat et al., 2020).

Science education involves various elements to obtain information and to get a change that is closely correlated to the environment in daily life. This subject contains a collection of observations and research results, describing and explaining what, why, and how some phenomena occur (Mohajan, 2018). Several domains in science are found at the primary and secondary education levels, including biology, physics, chemistry, as well as earth and space sciences (Hidayat et al., 2020). Science itself is a discipline consisting of physical and life sciences. In the physical sciences, they include chemistry, astronomy, mineralogy, geology, meteorology, and physics. In the life sciences, they include biology, zoology, physiology, anatomy, cytology, microbiology, and embryology) (Mohajan, 2018). The scope of science itself can be felt by the sense of taste, sight, and hearing.

Science education is given to students at almost all levels of education in Indonesia. Science education materials are found in every curriculum that is a reference at every level of education, one of which is in vocational high schools. Vocational high schools have approximately 146 majors or vocational fields. Most majors have a curriculum on science learning.

Every student must study science material in the curriculum in vocational high schools as a basis for studying further knowledge material (Hidayat et al., 2020). Usually, the material on science in vocational high schools is taught in grades ten and eleven. Students who attend vocational high schools are required to take lessons about science in accordance with the existing curriculum without exception, especially for SSNs.

SSNs are students who have problems both due to internal and external aspects so that it has an impact on the emergence of problems in the science learning process. This makes it difficult for them to understand the information in the material presented, so they need special services and education (Maryanti et al., 2021). In line with the inclusive education system, every student has the right to receive education in any school. Thus, SSNs attend regular schools, one of which is in vocational high schools.

Vocational high schools are one of the schools targeted because students want to have the expertise as a provision to be able to enter the world of work directly (Haricahyo et al., 2020). Even though SSNs have different abilities from students in general, the material in the curriculum provided is the same. SSNs must be able to adapt to the curriculum in the vocational school where they study (Maryanti et al., 2021). If SSNs are not able to follow the curriculum in vocational high schools, most students choose to attend special schools. At the vocational high school level, culinary is one of the skill programs that are of interest to SSNs.

3. Methods

The reliability and validity tests were carried out by experts in the field of special education and curriculum. Experts were several lecturers, relevant officials, and teachers. The results of the reliability and validity test become instruments that are ready to be used to obtain research data.

The research procedure in this study for getting analysis of curriculum had several stages. The stages were started from planning activities, research processes, to the evaluation or data analysis of research results. The stages are

- (i) Seeking information about curriculum components, science education curriculum in vocational school, and science learning tools for SSNs. The information was collected from national data and search engines such as Google and google scholar. Detailed procedure for searching in the search engine is explained in our previous studies (Nandiyanto et al., 2020; Azizah, Maryanti, & Nandiyanto, 2021; Husaeni & Nandiyanto, 2022).
- (ii) Obtaining the national curriculum analysis. At this stage, the national curriculum analysis was done to determine the science education curriculum from the government for vocational students; Vocational school curriculum data on science education were obtained from our previous study (Maryanti and Nandiyanto, 2021)

(iii) Analyzing the national curriculum from the government and the curriculum for vocational schools. We analyzed and compared aspects of core competencies and basic competencies (see Table 1). In addition, there are several types of SSNs, including students with visual impairments (SSN A), students with hearing impairments (SSN B), students with intellectual disabilities (SSN C), and students with motor impairments (SSN D) (Maryanti et al., 2021).

In addition, this study focused on the curriculum for the culinary department in the vocational school. The data analysis technique was presented in descriptive form. The output from the analysis becomes the basis for examining individual learning programs for SSNs and making plans for their learning programs. Then, the science education curriculum in the vocational school used for general students and SSNs was compared.

Table 1 - Comparison of science education curriculum for general students and SSNs with taxonomy bloom

Aspect	Science education curriculum (general and inclusive students)	Analyze Taksnom i Bloom	Science education curriculum (SSN students)	Analyze Taksnomi Bloom	Problems in SSN	Contrast / new / adapted competencies
Knowledge competency	3.1 Physical quantities	C3	3.1 Physical quantities	C1, C2, and C3	SSN A • Have a visual impairment • Have low knowledge of a concept • Difficulties in understanding symbols or abstract components • Difficulties in understanding complex information • Difficulties in understanding visually • Difficulties in understanding an information concept • Difficulties identifying symbol information SSN B • Has a hearing impairment • Difficulties communicating verbally • Difficulties in understanding abstract information • Difficulties in understanding complex information • Difficulties in understanding	SSN A • Require auditory learning media, simple, concrete, and as needed. • Require learning by doing method involving the senses of touch and auditory • Require simple and interesting learning strategies as needed. SSN B • Require visual, simple, concrete, and appropriate learning media. • Require learning by doing method involving the tactile and visual senses. • Require simple and interesting learning strategies according to needs. SSN C • Require visual, auditory, kinesthetic, simple, concrete, interesting, and appropriate learning media. • Require interesting methods and learning by doing involving the senses of touch, auditory, and visual. • Require a method of habituation.
	3.2. Force, work, and energy in motion problem	C4	3.2. Force, work, and energy in motion problem	C1, C2, C3, and C4		
	3.3. Elasticity and surface tension	C4	3.3. Elasticity and surface tension	C1, C2, C3, and C4		
	3.4. Temperature and heat	C4	3.4. Temperature and heat	C1, C2, C3, and C4		
	3.5. Electric quantities	C4	3.5. Electric quantities	C1, C2, C3, and C4		
	3.6. Material and its changes	C4	3.6. Material and its changes	C1, C2, C3, and C4		
	3.7. Mixtures and compounds	C4	3.7. Mixtures and compounds	C1, C2, C3, and C4		
	3.8. Solution and solution concentration	C4	3.8. Solution and solution concentration	C1, C2, C3, and C4		
	3.9. Acids, bases, and salts	C4	3.9. Acids, bases, and salts	C1, C2, C3, and C4		
	3.10. Colloid system	C5	3.10. Colloid system	C1, C2, C3, C4, and C5		
	3.11. Oxidation and reduction reactions	C4	3.11. Oxidation and reduction reactions	C1, C2, C3, and C4		
	3.12. Macromolecules	C4	3.12. Macromolecules	C1, C2, C3, and C4		
	3.13. The nature, types, and impacts of using polymers	C5	3.13. The nature, types, and impacts of	C1, C2, C3, C4, and C5		

			using polymers		information auditory SSN C	<ul style="list-style-type: none"> • Require simple and interesting learning strategies according to needs.
	3.14. Pollution on ecosystem balance	C4	3.14. Pollution on ecosystem balance	C1, C2, C3, and C4	<ul style="list-style-type: none"> • Have intelligence barriers • Have adaptive behavior barriers • Have low memory • Have low learning motivation • Have low memory • Have low concentration • Difficulties in remembering abstract symbols • Difficulties in understanding complex information 	<ul style="list-style-type: none"> • Require simple and interesting learning strategies according to needs. • Require auditory, visual, simple, concrete, and appropriate learning media. • Require interesting methods and learning by doing involving the auditory and visual senses. • Require simple and interesting learning strategies according to needs.
					SSN D	
					<ul style="list-style-type: none"> • Have a motor impairment • Has difficulties in conveying information verbally • Have low focus and concentration 	
Skills competency	4.1. Physical quantities	C3	4.1. Physical quantities	C1, C2, and C3	SSN A	SSN A
	4.2. Force, work, and energy in motion problem	C5	4.2. Force, work, and energy in motion problem	C1, C2, C3, C4, and C5	<ul style="list-style-type: none"> • Have a visual impairment • Have low concept skills 	<ul style="list-style-type: none"> • Require auditory learning media, simple, concrete, and as needed. • Require adaptive and assistive technology media
	4.3. Elasticity and surface tension	C3	4.3. Elasticity and surface tension	C1, C2, and C3	<ul style="list-style-type: none"> • Difficulties in performing orientation and mobility activities 	<ul style="list-style-type: none"> • Require learning by doing method involving the senses of touch and auditory
	4.4. Temperature and heat	C3	4.4. Temperature and heat	C1, C2, and C3	<ul style="list-style-type: none"> • Difficulties in carrying out abstract instructions 	<ul style="list-style-type: none"> • Require simple and interesting learning strategies as needed.
	4.5. Electric quantities	C4	4.5. Electric quantities	C1, C2, C3, and C4	<ul style="list-style-type: none"> • Difficulties in performing complex instructions or activities 	<ul style="list-style-type: none"> • Require simple and interesting learning strategies as needed.
	4.6. Material and its changes	C3	4.6. Material and its changes	C1, C2, and C3	<ul style="list-style-type: none"> • Difficulties in carrying out instructions from information visually 	<ul style="list-style-type: none"> • Require simple and interesting learning strategies as needed. • Require visual, simple, concrete, and appropriate learning media.
	4.7. Mixtures and compounds	C3	4.7. Mixtures and compounds	C1, C2, and C3	<ul style="list-style-type: none"> • Difficulties in carrying out activities to identify information 	<ul style="list-style-type: none"> • Require adaptive and assistive technology media
	4.8. Solution and concentration	C6	4.8. Solution and concentration	C1, C2, C3, C4, C5, and C6	SSN B	<ul style="list-style-type: none"> • Require a learning process by doing methods involving the tactile and visual senses.
	4.9. Acids, bases, and salts	C3	4.9. Acids, bases, and salts	C1, C2, and C3	<ul style="list-style-type: none"> • Has a hearing impairment 	

4.10. Colloid system	C3	4.10. Colloid system	C1, C2, and C3	<ul style="list-style-type: none"> Difficulties communicating verbally Difficulties carrying out instructions from abstract information Difficulties carrying out instructions from complex information 	<ul style="list-style-type: none"> Require simple and interesting learning strategies according to needs.
4.11. Oxidation and reduction reactions	C3	4.11. Oxidation and reduction reactions	C1, C2, and C3	<ul style="list-style-type: none"> Difficulties carrying out instructions from abstract information Difficulties carrying out instructions from complex information 	<ul style="list-style-type: none"> Require visual, auditory, kinesthetic, simple, concrete, interesting, and appropriate learning media.
4.12. Macromolecules	C4	4.12. Macromolecules	C1, C2, C3, and C4	<ul style="list-style-type: none"> Difficulties carrying out instructions from complex information 	<ul style="list-style-type: none"> Require adaptive and assistive technology media
4.13. The nature, types, and impacts of using polymers	C4	4.13. The nature, types, and impacts of using polymers	C1, C2, C3, and C4	<ul style="list-style-type: none"> Difficulties carrying out instructions from auditory information Difficulties carrying out instructions from complex information 	<ul style="list-style-type: none"> Require interesting methods and learning by doing involving the senses of touch, auditory, and visual.
4.14. Pollution on ecosystem balance	C3	4.14. Pollution on ecosystem balance	C1, C2, and C3	<ul style="list-style-type: none"> Difficulties carrying out instructions from auditory information Difficulties carrying out instructions from complex information Difficulties carrying out instructions from abstract information Difficulties conveying verbally information 	<ul style="list-style-type: none"> Require a method of habituation. Require simple and interesting learning strategies according to needs. Require auditory, visual, simple, concrete, and appropriate learning media. Require adaptive and assistive technology media Require interesting methods and learning by doing involving the auditory and visual senses. Require simple and interesting learning strategies according to needs.

In general, the research design includes the analysis of the national curriculum and its content on science education in the vocational school. The analysis investigated the condition of the curriculum for general students and SSN. The selection of documents for the analysis focused on the delivery of science in the vocational school. This study also focused on specifically 1 department only (i.e. culinary department), while the total number of departments in vocational schools in Indonesia is 146 departments. Table 1 is the documents gained from the national curriculum. We displayed the code of the documents directly the same in the coding in the national curriculum. As we explained above that the analysis investigated the condition of the science education curriculum for general students and SSNs, the relevant categories were selected based on science education, SSN, and vocational school in the national curriculum documents.

4. Results and Discussion

4.1 Information about Science Education Curriculum in Vocational Schools

The curriculum is the most important part in the implementation of education, especially in vocational high schools. The curriculum is a device in which it contains material that must be achieved, as an effort to achieve national learning goals (Solikhah & Budiharso, 2019). One of the materials in the curriculum in vocation school is about science education. Most of the material in each department is related to science education (Vieira et al., 2016). That is because material about science is closely relating to phenomena that occur in the environment around students. Moreover, vocational school students are formed and prepared to have the skills to be independent in their lives. In addition, it is important to study science material as a basis of knowledge to learn further knowledge.

This study analyzed and compared the curriculum documents used in schools with the national curriculum on science materials. Table 2 shows the science education curriculum used in vocational high schools in the culinary department. The curriculum describes two core competencies, namely competence 3 relating to knowledge and competence 4 relating to skills. The two core competencies are translated into several basic competency points which include material on science education.

4.2 Analysis of Science Education Curriculum in Vocational School

The development of the Indonesian 2013 curriculum is used in vocational schools in Indonesia at this time. The curriculum is oriented to the needs of today's world of work (Rosina et al, 2021). The activities under the coordination of the curriculum include:

- (i) Planning: in the form of curriculum validation activities, syllabus preparation, learning implementation plans, preparation of academic calendars, preparation of teaching materials.
- (ii) Implementation: in the form of preparing learning schedules, analyzing the needs of classes, laboratories, and practice rooms, analyzing the needs of teachers and laboratory assistants, analyzing the suitability of learning activities with the academic calendar, and conducting classroom supervision.
- (iii) Evaluation: Evaluation activities were coordinated by the curriculum sector, including evaluation of teaching and learning activities in the form of preparing grids, preparing questions, analyzing items, analyzing test results, remedial programs, and enrichment programs.

The curriculum used affects the profile of graduates (Rosina et al, 2021). Vocational high school graduates are prepared to have skills that will later be involved in the industrial world (Hidayat et al., 2020), one of which is the culinary field or culinary arts. In this culinary department, material about science is contained in the tenth-grade curriculum. The science material in the curriculum at the culinary vocational school is closely relating to aspects in the culinary industry. Several examples of the importance of science education can be found:

- (i) The temperature that is good for a specific material, relating to the ability to estimate the level of heat for cooking,
- (ii) The mixture of compounds relates to the ability to mix food ingredients
- (iii) The solution material relates to a dough or the level of viscosity of food ingredients.

In most of the learning activities of science in vocational school, teachers teach with direct practical activities. Every student is required to study the material in the curriculum that has been made without exception, including SSNs. Catering or culinary majors are majors that are more in demand by SSNs. This is because cooking skills are considered easier for SSNs to learn. SSNs are easier to learn something through habituation (Maryanti et al., 2021). Activities related to catering activities, and they often encounter and do in their daily activities.

4.3 Analysis of Science Education Curriculum for Students with Special Needs in Vocational School

Every Indonesian citizen has the same rights as students in general to get an education (Maryanti et al., 2021). The implementation of education must not discriminate against anyone based on the background and existence of the physical, mental, intellectual, social, and/or emotional conditions of the learners or their students. That is the reason why several vocational high schools accept students with special needs.

Table 2- Curriculum for science education in vocational high schools. The table was adopted from literature (Maryanti and Nandiyanto, 2021)

CORE COMPETENCIES 3 (KNOWLEDGE)	CORE COMPETENCY 4 (SKILLS)
3. Understand, apply, analyze, and evaluate factual, conceptual, basic operational, and metacognitive knowledge in accordance with the field and scope of Simulation and Digital Communication, and Basic Tourism Sector at the technical, specific, detailed, and complex level, relating to science and technology, arts, culture, and humanities in the context of developing self-potential as part of the family, school, world of work, national, as well as regional and international community members.	4. Take on specific tasks using tools/equipment, understanding information, and work procedures that are commonly carried out, and solve problems in accordance with the scope of Simulation and Digital Communication, and the Basic Tourism Sector. Show performance under the guidance with measurable quality and quantity in accordance with standard competencies. Demonstrate the skills of reasoning, doing, processing, and presenting effectively, creatively, productively, critically, individually and independently, collaboratively, communicatively, as well as solutely in the abstract realm relating to the development of what student learns at school and what is able to carry out specific tasks under direct supervision. Demonstrate skills in perceiving, readiness, and imitation, as well as getting used to (adaptive), proficient movements, making natural movements in the concrete realm relating to the development of what they have learned at school, and being able to carry out specific tasks under the supervision of life.
BASIC COMPETENCIES 3	BASIC COMPETENCIES 4
3.1. Applying physical quantities 3.2. Analyzing the relationship between force, work, and energy in motion problem 3.3. Analyzing elasticity and surface tension 3.4. Analyzing the relationship between temperature and heat 3.5. Applying electric quantities 3.6. Analyzing the material and its changes 3.7. Analyzing mixtures and compounds 3.8. Analyzing solution and solution concentration 3.9. Analyzing acids, bases, and salts 3.10. Evaluating colloid system 3.11. Analyzing oxidation and reduction reactions 3.12. Analyzing macromolecules 3.13. Understanding the nature, types, and impacts of using polymers 3.14. Analyzing the impact of pollution on ecosystem balance	4.1. Measuring physical quantities used in tourism 4.2. Solving the problem of the motion of objects in tourism based on the concepts of force, work, and energy 4.3. Conducting elasticity and surface tension experiments in tourism 4.4. Conducting researches and experiments on the influence of heat on the changes in temperature, shape, and shape of objects in the tourism sector 4.5. Calculating the cost of electrical energy used based on the use and technology of electronic equipment in the tourism sector. 4.6. Experimenting with material changes in the tourism sector 4.7. Conducting mixed and compound experiments in tourism 4.8. Make a solution at a certain concentration in the field Tourism 4.9. Experiment with the properties of acids, bases, and salts in Tourism 4.10. Conducting experiments to prove the colloid system in tourism 4.11. Conducting experiments on oxidation and reduction reactions in the tourism sector 4.12. Qualitatively testing the carbohydrate content, protein, and fat in the ingredients used in tourism 4.13. Identifying the impact of using polymers in tourism 4.14. Handling waste in the tourism sector to maintain the balance of the ecosystem

The above reason for the acceptance of several vocational high schools for students with special needs is supported by the existence of inclusive education. Every student has the right to receive education anywhere. Vocational high schools that are in great demand are the culinary arts major. This is because it is easier for students to understand something simple (Maryanti et al., 2021).

The curriculum for students is generally the same as for students with special needs. But it only differs in the strategies, methods, and media used according to the needs of students. The difference is when the teacher makes a differentiated curriculum. The goals of the national curriculum equally must be achieved by students without exception. The difference lies when pouring into specific learning objectives in individual learning programs which are the elaboration of a differentiated curriculum. The difference is in the operational work in Bloom's taxonomy. The cognitive stages of bloom's taxonomy include: observing (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and creating (C6) (Harahap et al, 2019). Some students with special needs may be able to reach the cognitive stage according to Bloom's taxonomy the same as students in general, namely in accordance with the curriculum objectives of the government. However, not a few students with special needs require modification of operational verbs for special learning objectives so that the cognitive stages according to Bloom's taxonomy are lower than students in general, especially for students with intellectual disabilities (SSN C) (see Table 1).

The curriculum still refers to the national curriculum but there is development in the learning process. All students are seen as equal as part of students who have the right to obtain quality educational services in accordance with their potential and needs. This is based on the view that education is a process of developing the potential of students so that they can live their lives and lives properly in society without depending on others.

SSNs have learning difficulties or barriers in attending education organized for students in general, so they need special education tailored to their abilities in order to reduce or even eliminate obstacles in the teaching and learning processes (Al-Rowaily et al., 2012). Education expects that SSN can develop themselves, improve their potential optimally according to their abilities. Indeed, in the end, they can live independently in the midst of society without depending on the help of others, even if only for their own needs.

Currently, special education for SSN organized by the government is not only in the form and system of special/segregated schools in special schools but also in the form and system of inclusive education held in general schools (Hidayat et al., 2020). The implementation of inclusive education in general schools gives opportunities for SSN to participate in their education with other peer students by modifying various components of education and learning in order to achieve achievements according to their potential (Mohajan, 2018).

SSNs are students who have various characteristics of problems due to both external and internal factors (Maryanti et al, 2021). The characteristics of the problems that SSNs have resulted in the emergence of several problems in the learning process (Maryanti et al, 2021). There are several types of students with special needs, including students with visual impairments (SSN A), students with hearing impairments (SSN B), students with intellectual disabilities (SSN C), and students with motor impairments (SSN D) (Maryanti et al., 2021). Each student has different problems see Table 1. This causes them to need special education and services. So far, the competencies in the government's national curriculum on science education are quite relevant and possible to be achieved by some students with special needs with cases of certain barriers. The main key point that must be considered is not the problem of changing the competence of the national curriculum, but how the skills of teachers in making a differentiated curriculum are outlined in the individual learning programs according to student's needs. This is a solution to bridge the gap between achieving the goals in the national curriculum and meeting the needs of children.

One of the schools providing inclusive education is the vocational high school in West Java, Indonesia. This vocational school has received several students identified as having SSN conditions. They receive education in various majors, one of which is culinary arts. They all get the same educational services as other students without discrimination. This condition will have an impact on the education and learning process carried out in the school/class. Teachers do not only deal with students but also have to deal with SSN with specific obstacles and difficulties. Thus, teachers are needed to have creativities and abilities in designing and compiling a curriculum so that its implementation can later accommodate SSN so that they obtain optimal performance according to their abilities (Maryanti et al., 2021).

The curriculum used in vocational school is basically a general vocational school curriculum; However, due to the diversity of abilities, barriers, and learning potentials possessed by each student, the general school curriculum is modified or developed so that it fits the needs of students, especially SSN which are known through identification and assessment activities (Chuntala, 2019). In practice, teachers must develop a curriculum and adapt it to the needs of students, or this is what we often call a differentiated curriculum. A differentiated curriculum is a curriculum that is tailored to the needs of students (Suherman et al., 2021). Core competencies and basic competencies in the national curriculum remain a reference. The individual learning program is a learning implementation plan program that is tailored to the needs of students, both for short-term and long-term education.

In the individual learning program for science learning in vocational school, the teacher must adjust the methods, media, and learning objectives based on the learning needs of SSNs and remains guided by the curriculum from the government. Individual learning programs must be made to make it easier for SSNs to understand the material presented. They need special education services (Maryanti et al., 2021). Therefore, even though the curriculum material used is the same, it still requires development and modification in the learning process. The use of methods and media in accordance with the needs of students makes it easier for SSNs to achieve learning. The same with students in general, SSNs can achieve the goals of the national curriculum on science education at the vocational high school.

From the explanation above, basically the curriculum is the same for students in general and SSNs in terms of core and basic competencies. However, the curriculum for SSN used is a differentiated curriculum or adapted to the

requirements of SSN. The difference is in the objectives of the learning process made in individual learning programs. Individual learning programs are created as a vehicle for bridging students to achieve the existing curriculum or national curriculum (Mohajan, 2018).

5. Conclusion

This study analyzes the science education curriculum in vocational high schools majoring in catering for SSN. Activities were carried out by comparing the national curriculum and current conditions. The curriculum used for students in general and SSN was analyzed. The research analyses show that there is no difference between the curriculum components in the core competencies and the basic competencies used for general students and SSNs. The main difference is how to make programs for teaching and learning SSN. The curriculum used for SSN is a differentiated curriculum. The existence of adaptation and modification of the objectives and the learning process is important. But, the core competencies and basic competencies used are the same for general students and SSNs. It is intended that the national goals in the curriculum can be obtained and the needs of students can be met and the potential of students can develop optimally, especially in science education. This research is expected to become knowledge for vocational schools that accept SSNs, and this study can be an alternative in making a differentiated curriculum for students, making it as one of the solutions in teaching general students and SSNs.

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