

# Exclusivity of Animation Industry Education Curriculum Raden Umar Said Vocational School Kudus

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## ABSTRACT

This research was conducted based on observations of Raden Umar Said Vocational High School (SMK), which was originally a suburban Vocational School turned into an international standard superior school with a level of progress in the animation industry education curriculum in the applied learning process. The purpose of this study was to analyze the learning process in the implementation of the animation industry education curriculum at Raden Umar Said Kudus Vocational School. This type of research uses descriptive qualitative methods with a phenomenological approach to reveal more deeply the phenomenon of the industrial education curriculum and the learning process as curriculum implementation at Raden Umar Said Kudus Vocational School. Data collection techniques are carried out by means of observation, interviews, and documentation. The source of this research data is primary data obtained from interviews with the Principal, Deputy Head of Curriculum, teachers, and students at SMK Raden Umar Said Kudus. Research data validity techniques using method triangulation and theory triangulation. The results of the study can be concluded that the learning process uses a *teaching factory* based on *project based learning* (PjBL) and PBL which develops the entrepreneurial spirit of its

graduates. Students find conceptual understanding after going through the practical process in the studio. Fun studio and learning space by combining general and productive material (thematic learning) with the essential curriculum. Learning is supported by complete and sophisticated facilities from the animation room, recording room, sound editing, color grading room, mini theater. *Teaching factory* learning uses job sheets, block schedules, there are products and markets with assessments in the form of final assignments and work exhibitions. Industrial learning with a block learning system with learning target achievements determines the duration of learning time. Curriculum development carried out at RUS began with: 1) integrated/synchronous curriculum alignment with industry; 2) essential curriculum (non-productive curriculum that supports major material); and 3) one competency material in the major concerned.

**Keywords:** Curriculum, Curriculum Development, Animation Industry Education.

## INTRODUCTION

The art of world animation continues to develop following the development of the all-digital era. Indonesia has a diversity of cultures and diverse creative talents. The expectation is to become the center of the world's animation industry. An education

system that creates opportunities to build the animation industry in this country is urgently needed. A special challenge for Vocational High Schools, especially the Animation Skills Program, is to prepare graduates with good work competence. SMK as a vocational education institution that prepares skilled, competent and adaptable workforce candidates with the development of science and technology.

Law No. 20 of 2003 chapter 15, concerning the National Education System, SMK is secondary education that prepares students specially to work in certain fields. The general goal is to increase faith, devotion to God Almighty, develop the potential of students with noble character, noble knowledge and insight into nationalism. The specific objective is to prepare students with the knowledge, competence, technology and art to become productive human beings. Able to work independently, fill job vacancies in the world of business and industry as a middle-level workforce in accordance with competence. Based on article 15, vocational education is secondary education that prepares students specially to work in certain fields.

A quality education system cannot be separated from the quality of the curriculum applied in the learning process. The curriculum has a central role that must be considered. Whoever masters the curriculum plays an important role in governing the fate of his nation and country in the future (Yamin, 2012:14). Vocational schools must always develop their curriculum. Curriculum development is a curriculum planning process that produces broad and specific curriculum plans (Hamalik, 2007:183). The curriculum is not the only determinant of the quality of education nor is it the sole tool for elaborating the vision of education (Balen, 2000:49). The curriculum remains a commonly known strategic device for matching interests and shaping individual conceptions and behavior (Suwignyo, 2007). Curriculum development is an important part of the process of successful

learning in educational institutions. Improving the quality of education by developing curriculum improvements, procuring textbooks/other reference books, improving the quality of teachers, educational staff through various trainings, and improving educational qualifications, improving education management, and procuring other facilities.

Curriculums at all levels and types of education are developed on the principle of diversification according to educational units, regional potential, and students (Andini, 2018). Curriculum development requires the provision of textbooks, workforce development, facilities and infrastructure and existing resources (Adebayo, 2018). The curriculum needs proper design to be able to provide training in the skills identified in the job market (Olotewo, 2017). Graduates who go straight to work are required attributes and skills in the Industrial Revolution 4.0 era. Such as the ability to think critically, adaptability, entrepreneurial spirit that thinks critically, is innovative, accountable, is driven by purpose and enthusiasm and relevant skills to be ready to work (Bhattacharyya, 2018).

Implementation of the curriculum according to industry needs is accompanied by improvements in terms of teacher qualifications, tools, practicum materials, and the use of learning models according to industrial needs (Aprianto et al., 2020). Policy solutions and practical implementation to increase the absorption capacity of SMK graduates, such as: improving learning facilities, industry-based curricula, routines, holding job matching, job fairs, alumni networks, collaboration with the ministry of industry, the ministry of labor (Sunarto & Supriadi, 2019). Now the needs and demands of the world of work in the industrial era 4.0 demand a competitive workforce. Therefore, the world of education through educational institutions must be able to produce people who have strong character, are skilled, creative, innovative, and competent in the field of technopreneurship and are sensitive to the

local and global environment (Haryono et al., 2017).

The problem that arises is SMK graduates are ready to work. Students must be prepared with skills based on industry-based competencies. Vocational High School graduates must have the character of discipline, hard work, creativity, independence, responsibility, and industry-based competence. The strategy for implementing industry-based education includes 1) a curriculum that is link and match with the industrial world; 2) *teaching factory* programs; 3) internship in the industrial world; 4) full Expertise Competency Test (UKK) by DU/DI which has the applicable requirements/conditions; 5) professional staff from DU/DI as guest teachers at SMK; and 6) the relevance of SMK facilities and infrastructure to the industrial world. Guaranteeing the quality of graduates is an important aspect that needs to be improved in the world of education, especially SMKs. Therefore, a special form of quality assurance management model for SMK is needed. Holistic Skills Education (Holsked) is one of the manifestations designed to guarantee the quality of SMK in a simple way (Munastiwi, 2015).

The Djarum Foundation together with Autodesk and Sumitomo Mitsui Banking Corporation built a studio building along with an animation vocational curriculum at Raden Umar Said Vocational School (RUS), Kudus, Central Java (Simatupang, 2016). Build facilities, infrastructure, teaching and learning systems, curricula, and other equipment. The presence of the RUS Animation Studio aims to produce quality graduates who are ready to face the world of work armed with international certification, skilled and ready to work at world level. RUS graduates are expected to work in the high-income creative industry sector. This studio opens foreign investment for the animation industry. Creating creative works of art, introducing Indonesian local wisdom to all animation show lovers around the world.

The development of the RUS Animation Vocational School touches the education system. The Djarum Foundation aligns the school curriculum with industry needs to increase student competence. The alignment involves professionals to ensure the alignment of the school curriculum. Teachers are trained and certified according to world of work standards. Invite industry to take part in the learning process. Industrial standard infrastructure and facilities improvement. The goal is to minimize the gap between what is learned at school and at work. Students learn while working through *teaching factory* and PjBL method projects. The goal is that students are trained to be ready to fulfill real jobs provided by industry to schools. At SMK RUS Kudus the *teaching factory* is the soul of all learning which is supported by the school management system under the control of the school principal and foundation administrators. In the *teaching factory* technical guide issued by the P-SMK director in 2017 it is stated that the *teaching factory* is a product-based learning model (goods/services) through school synergy with industry to produce graduates who are competent according to industry needs.

The developed curriculum has significant differences compared to the general SMK curriculum. The curriculum at SMK RUS requires 70% of study time to practice and produce portfolio work. The learning process is a combination of general and productive subjects. Students are encouraged to improve skills and produce work. The students are equipped with tiered and continuous skills following industry or market demands. In the first year students are provided with general knowledge about animation. Students are given the opportunity to look for interests that they want to pursue next. One year later they will pursue this field by using a self-compiled curriculum based on the goals to be achieved through project-based learning (PjBL). Internship is a form of practice and application of previously acquired

knowledge. This apprenticeship process is useful for gaining experience from the real world of work and industry needs, which will also add to their portfolio. In the third year they collaboratively complete portfolios that come from clients.

However, this method changes not only the curriculum but also the layout of the class, the placement of tables and chairs, teaching and learning activities, to the interaction of teachers and students. The goal is for students to be more collaborative and confident in conveying their creative ideas. The infrastructure developed in the learning process is useful for facilitating the development of student-centered and active learning characters. Both of these are considered capable of bringing students as the main focus of learning. The teacher is no longer the sole center of knowledge and attention in the classroom. The facilities at RUS Vocational School are complete and sophisticated, from animation rooms, recording and sound editing rooms, color grading rooms, mini theaters and supporting facilities such as gyms and places with unique designs that are deliberately made to relax students. The Animation Studio for SMK Raden Umar Said Kudus has a unique design. The concept is to make users comfortable so that they feel at home doing activities in the studio. Classrooms to practice rooms are designed to be very luxurious and comfortable, they are more like a hotel lobby than a class. Classrooms are also arranged with various themes, such as games, animation to photography which are very comfortable and support animation design work and the like. There are also classrooms that face the view of Mount Muria directly.

Experienced mentor Woody Woodman from Walt Disney Animation was hired by RUS to become a mentor. Masami Obari (Gundam animator) who animated *Mulan* (1998), *Tarzan* (1999), and *Brother Bear* (2003) also became the supervising teacher at this Vocational School. RUS Vocational School students have succeeded in creating world-class animation products. Some of

their products have been broadcast on several television stations and movies, both at home and abroad. RUS Vocational School students took part in making six episodes of the film *Si Unyil* and making the big screen film *Banda the Drak Forgotten Trail* directed by Jay Subyakto. Making world-class animated films *Pasoa Sang Pemberani*, Paula (Singapore), making short films *Untsring Your Hart* and *Sabda Alam*. At Raden Umar Said Vocational School, the animation production facilities are on par with Hollywood production houses such as Pixar and Disney. Students can optimally develop their abilities to compete in the international arena. The standard of education at RUS Vocational High School is in line with the world of animation that is currently developing. The curriculum was developed according to the needs of the animation industry, that is making 3D animation films.

Raden Umar Said Vocational School (RUS) Kudus, the first Animation school in Indonesia with international standards. This school has successfully implemented various ICT-based programs. This school shows the existence of a SMK that is truly a technology brand. The school hopes that all students and graduates are ready to face the era of the industrial revolution which is completely connected to applications and the internet. RUS Kudus Vocational School unites the industrial world with the school world. RUS strives to provide services with full SMK nuances.

Further, there needs to be a change in methods in the current Indonesian education system. The current learning method should be full of creativity, collaboration, communication, and critical thinking and innovation. This concept should encourage teachers and students to be free in liberating mindsets and actions in a positive and broad manner, in accordance with existing guidelines in a responsible manner. RUS Vocational High School alumni who are unemployed are becoming more and more interesting to be able to reduplicate the system to other schools so that Vocational

Schools truly become a school that provides professional workers, not unemployed provider. Hopefully this chance can help SMK administrators to truly become SMKs instead of being managed like SMAs. Our hope is that all SMK alumni are truly ready to enter the world of work because what they master is practical competence regarding their respective expertise competencies, not graduating with only the stories about their expertise competencies.

The success of SMK RUS in answering the needs of the creative industry cannot be separated from the role of PT Djarum. Through the Djarum Bakti Education coaching program, this SMK has become global. The school's vision is to make Raden Umar Said Kudus Vocational School the best Animation school in Southeast Asia in 2030. The mission is to hone students' interests and talents so they can become eternal learners who are competent and able to work professionally in the creative industry. SMK RUS is committed to preparing quality students who can accepted by the industrial world. The curriculum was overhauled to suit the industrial world. Kudus RUS Vocational School has provided a SMK management model that can be synchronized between schools and industry. This method is exemplary, the mechanism that is implemented needs to be disseminated throughout the Archipelago so that existing SMKs can create a productive workforce not as unemployed.

From the description, it is very interesting to study how the exclusivity of the curriculum and the learning process of the animation industry education at Raden Umar Said Kudus Vocational School is productive, accountable, competitive, and marketable. The developed curriculum has significant differences compared to the general SMK curriculum. The curriculum developed is in accordance with the current needs of the animation industry, that is the making of three-dimensional animated films or 3D Animation. SMK RUS has carried out the field of study of the creative industries covering the suitability of curriculum

development with labor market standards, quality learning processes with reliable, market-appropriate certified educators, has international standard facilities and runs *teaching factory* three-dimensional animation film. Animation Vocational School of Raden Umar Said Kudus produces graduates who are competent in the field of 3D Animation who are oriented towards the needs of the world of work and the television/film industry. Raden Umar Said Vocational School has professional educational human resources, has effective and professional management, has a conducive educational environment and can build public trust. RUS Animation produces competent graduates in the field of 3D Animation that are oriented towards the needs of the world of work and the television/film industry. From the description above, the researcher is interested in conducting research entitled "Exclusiveness of the Animation Industry Education Curriculum at Raden Umar Said Kudus Vocational School".

## **MATERIALS & METHODS**

This study used a descriptive qualitative method with a phenomenological approach to reveal more deeply the phenomenon of the industrial education curriculum and the learning process as curriculum implementation at Raden Umar Said Kudus Vocational School. This research has been conducted at Raden Umar Said Vocational School, an animation industry education vocational school that applies the creative industry curriculum for making 3D-Animation films. The data collected in the research was through in-depth face-to-face interviews with the process of submitting unstructured questions and in a fluid atmosphere to the Principal, Deputy Head of Curriculum, Teachers, Students and deepened by using participatory observation techniques and document searches. The data validity technique in this study used theoretical triangulation by cross-checking whether the data found in the field regarding the animation industry education curriculum

and the process of implementing the animation industry education curriculum at Raden Umar Said Kudus Vocational School fit the existing theories and triangulation methods to compare data results of observations with data from interviews with the Principal, Deputy Head of School for Curriculum, and teachers. The focus of the aim of this research is to analyse the learning process in the implementation of the animation industry education curriculum at Raden Umar Said Kudus Vocational School.

## RESULT & DISCUSSION

The processes and mechanisms for school management and learning that were practiced at SMK Raden Umar Said Kudus were covered under the name *teaching factory* based on project-based learning (PjBL) and PBL. "RUS Animation" engaged in the animation industry. In the *teaching factory* technical guide issued by the P-SMK director in 2017 it is stated that *teaching factory* is a product-based learning model (goods/services) through school synergy with industry to produce graduates who are competent according to industry needs. At SMK RUS Kudus the *teaching factory* is the soul of all learning which is supported by a school management system under the control of the school principal and foundation administrators.

In an interview with the school principal Fariddudin regarding the implementation of the *teaching factory* at SMK RUS Kudus he revealed that: "The learning focus for Grades X, IX, and XII each had a different learning focus. Class X is focused on practical mastery of animation software, class XI is directed to the world of work/industry, and Class XII is focused on completing the final project. SMK RUS has implemented a *teaching factory* with wider modifications. The resulting product does not stop at product output but more than that, the product was sold to the industry and the results were used by the industry. The *teaching factory* carried out at SMK RUS is the provision of theory to a

minimum. Students find conceptual understanding after they went through the practical process in the studio. Every day the participants were in the studio. There is no special class where to study theory, there is a studio that is designed as a practical learning class. The understanding of the theory is done through practice. There was almost no expanse of understanding and principles, there was only students did assignments and then they drew their own conceptual conclusions according to the practical learning process they go through. (Interview 20 August 2022).

Lamancusa et al., (2008) argued that there are several things that encourage the emergence of the *teaching factory* concept, namely; the need for direct learning practices in accordance with real field conditions, a teamwork experience is needed involving students, educators and industry so that all benefit. *Teaching factory* with real project-based at SMK RUS to develop the entrepreneurial spirit of its graduates. The chosen learning approach is project-based learning (PjBL). Kusdaryani et al., (2015) project-based learning is effective in increasing student entrepreneurship. Project-based learning is very good when combined with entrepreneurial activities. Implementation of project learning can increase motivation and positive self-image in students (Doppelt, 2003). Frequent approaches to developing entrepreneurship are learning by doing, project work, projects with actual clients, teamwork, workshops, studios, problem-based approaches (Matlay & Carey, 2007). Apart from projects, the design thinking learning model can be selected in the development of entrepreneurship in schools (Kemendikbud, 2019). In the United States, universities have developed curricular and co-curricular activities to involve all students in innovation and entrepreneurship (McClure, 2015). Co-curricular supports curricular programs set by educational institutions, both schools and tertiary institutions.

The learning approach that is most often used in entrepreneurship education is a problem-based approach and provides experience to develop entrepreneurship (Bliemel, 2013). Entrepreneurship education with an experiential approach gradually pushes students out of their comfort zone and into the exciting world of entrepreneurship. The curriculum design introduces three levels of experiential learning opportunities that was indirect experience through guest speakers and mentors, virtual experience through in-class offerings, as well as real investors, and where possible direct experience through pitching their ideas at industry networking events and pitch competitions. This step-by-step approach eases students into the process of acting and thinking like true entrepreneurs.

In addition, Philip's research at a university in Nigeria stated that entrepreneurship education is perceived positively in all dimensions and shows a strong positive relationship between perceptions and entrepreneurial intentions. Building positive perceptions about entrepreneurship education among students is the basis for achieving its main goal. Entrepreneurship education is considered very important to provide opportunities for students to become individuals who are innovative, creative, independent, and become leaders who were able to face challenges. Therefore, entrepreneurship education is an effort to prepare graduates to become entrepreneurs so they can contribute to economic development (Philip et al., 2016). Interview with Rita Susianti, English teacher, regarding the implementation of adaptive normative learning or general lessons as follows: "Learning adaptive normative subjects or general lessons using integrated thematic with vocational subjects. General subject matter supports vocational material for making 3D animation films. The learning approach uses project-based learning (PjBL) and PBL. General material learning is at 1-4 hours Monday to Saturday. At the 5th hour until it is finished the

students already in the studio for the *teaching factory*. Midterm tests and final semester tests are in the form of projects that will be assessed jointly from integrated subjects.

The *teaching factory* learning model has 3 (three) components, there are: (i) the product as a competency introduction medium, (ii) a job sheet that contains work sequences and assessments in accordance with industry standard work procedures and (iii) setting a study schedule that allows delivery soft skills and hard skills to students optimally. Each skill competency in SMK can implement *teaching factory* through these 3 components according to the characteristics and complexity of each. The positive effect of using the PjBL model was also stated by Barak & Doppelt, (2000) where according to him project-based learning allows students to research, plan, design and reflect on the creation of technology projects according to their fields. PjBL is the best method for preparing students' futures because PjBL guides students to study across disciplines so that students can investigate problems in their surroundings.

Further interview with the deputy principal of the school Arif Jauhari about the Implementation of *Teaching factory* at RUS Kudus Vocational School he revealed that the learning system with the application of *teaching factory* at RUS Vocational School: "The learning process in RUS for class X students is provided with material in the science of animation. If class X goes up to class XI they must make or submit an application letter to be able to enter the division. A maximum of 2 divisions can be selected. The division is the division that is liked and controlled. Their application is in the form of a CV and a collection of portfolios. Cover letter, bundled with portfolio work. If you do not meet the requirements of the division, you must move the division. If you still choose the same division, you must study again in the desired division and must create a new portfolio. Class XI did internship for 1 year.

Their internship is at school with a portfolio. Class XII full for portfolio work from outside clients. Children in class XII join in one division and complete a project to make a final work product. The projects or portfolios they have created can be used as industry references for the assessment process in RUS, that is portfolio assessments made by students. The assessment is carried out by the industry, not by the teacher. Industry will complain and provide input to students. So they really make it according to the industry and the market. Pure industry judgment not from teacher based on compassion and common products. The client's revisions become their input for better project improvements." (Interview August 27, 2022).

Class X animation expertise competency is focused on basic conceptual mastery and technical skills regarding 3D animation. The students were thrown into the studio to work on several assignments. They directly face the animation software in the studio room. At this level students are required to have skills in using three-dimensional software, the choice of software falls on Autodesk Maya. With the mastery of Autodesk Maya software in Class X, Class XI students at RUS Vocational School directed to connections to the world of work or internship. The benefits of internship are numerous, such as increasing knowledge, insight, mental training to be more confident, independent, work faster because students already have links to work in the industry. This is in accordance with research from Hergert, (2009) that Field Work Practices (PKL) play an important role in helping students make connections between traditional courses and their workplaces, while research from Nicholas, (2016) states that students connect and apply academic experiences them to internship can increase their opportunities for work or entrepreneurship. This is also reinforced by the results of research conducted by Moses, (2017) that school industry collaboration is very important for both institutions (schools and industry) because it allows the industry

to get a competent and knowledgeable workforce at low cost because industries without knowledge cannot develop to survive, develop its public reputation while enhancing corporate social responsibility (CSR). For schools it is possible to produce quality, competent graduates with quality skills according to the needs and demands of DU/DI.

All the competencies taught are focused on competencies that will be used in the business world. Here the link between students and the business world begins. There are so many divisions in the industrial world, students are directed to mastery of at least one division in accordance with the one in the company where the students are connected. Here students begin to focus on producing task outputs related to certain industrial products.

The method used at SMK RUS to convince future users of its alumni is to pay serious attention to the portfolio. Students were directed to collect as many portfolios that have satisfactory quality with the main assessing is industry.

At RUS there are 15 mentor teachers from various film industries. Involving mentor teachers as controlling of the industry. These teacher mentors work from input in PPDB recruitment, curriculum development and curriculum alignment with industry, accompanying teachers in learning, and sharing projects. Teachers, mentors, and peer tutors were only tasked with guiding students. Evaluation of whether students are competent or not for a competency is determined by the results of an industrial assessment. In this case the industry becomes the king of determining whether students were competent. The results of the assessment of the work produced by students were collected into a portfolio bundle and this bundle will later be re-assessed by the industry to decide whether the alumnus can be accepted to work in his company. Here competence really becomes the main foothold, not a diploma or certificate.

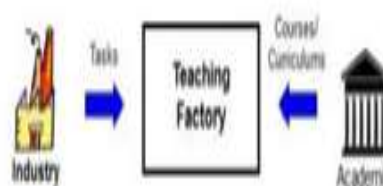


Class XII attention is focused on completing the final task. The 5th semester in class XII is focused on completing the final assignment in the form of an animated film. All students are required to develop a product in the form of an animated film. In this film form, texture, color, motion, and sound are packaged into one. This competency is the pinnacle of the Three-dimensional Animation study program. In completing the final assignment, students are provided with experience building teams with industry. They work with industry. Here students were directed to learn to build good cooperation. The final assignment project must be able to be sold to the industry. With this final project students begin to independently get results in the form of money from their work independently.

Interview with the Head of 3D Animation Pro, Rico Ardiansyah about the implementation of the assessment in the Animation department: "RUS animation is working on a project from a client. For example, SMK RUS gets an interactive virtual reality project from a client, SMK RUS can be involved in some modeling, animating and particle effects work. For the completion of this project the teacher and students collaborated in preparing the required resources. Requires modeler division, animator division and effect artist division. Processing time is determined by the client. In order to complete a project from a client, a compact and competent team structure is required. Projects from clients can function as soft skill development, can be used as portfolios that are useful as student capital to compete in the industrial world when they are already working. The industry will judge from the portfolio they have." (Interview 10 September 2022).

The advantage gained from the *teaching factory* is to increase the school's source of income which is useful for educational activities. The *teaching factory* presents the real DUDIKA in the school environment to prepare graduates who are ready to work.

*Teaching factory* according to the description of Rentzos et al., (2014) conveyed that *teaching factory* is a forum, atmosphere, activities, and place of learning that combines the school curriculum and tasks from industry. There was interaction between teachers, experts/technicians from industry, and students. The concept of *teaching factory* can be presented in Picture 1.



Picture 1 *Teaching factory* concept (Rentzos et al., 2014)

RUS invited guest teachers (teaching training) from well-known animators, they were Woody Woodman storyboard artist for Walt Disney's movies. Woody Woodman experienced at the Walt Disney Animation Studio which made the animations Mulan (1998), Tarzan (1999) and Brother Bear (2003). RUS also invited teaching training from Japan, Masami Obari, anime director/mecha designer Studio C-1 Neo. The guest teacher is invited to RUS once in a semester or once a year. The focus on revitalizing teacher human resources as educators and educational staff really needs their role. According to Mailool et al, stated: *In schools, teachers are human resources that play an important role in achieving quality education. In particular, the important role of teachers in the management of learning quality. Quality learning requires teachers who can teach effectively to support student success. Effective teaching practice is a form of quality teacher performance* (Mailool et al., 2020). Teachers have an important role in realizing educational attainment. Teachers play an active role in supporting student achievement, because in students who excel have qualified teachers. Some guest teacher activities can be shown in Picture 2.



Picture 2. Teaching training (Invited Teacher)

Teachers with good personalities reflect good teachers. According to Faturrahman “*Character determines one's private thoughts and actions. Good character is the inner drive to do what is right, to the highest standards of behavior in all situations*” (Rokhman et al., 2014). With a good personality, they will agree that the teacher's philosophy meant to be trusted (to be trusted) and to be emulated (to be a role model). According to Jones, (2018) how to position teachers in SMK “*There is a need to recognize and resource high quality, self-renewing vocational education teaching. This requires serious initial and continuing teacher education in applied and workplace-situated pedagogies. To develop and maintain its relevance in a changing workforce environment, vocational*

*education teaching practice must be based on applied research into the development and evaluation of the applied and workplace-situated pedagogies required to develop high-level technical skills and twenty-first century capabilities in context. Twenty-first-century vocational education must operate within a lifelong learning context, respond to digital disruption in education as well as industry and nurture innovation”.*

In addition, teachers have professional skills which consist of two interrelated parts, there are teaching skills and knowledge of the subjects to be taught. According to Anderson et al, argued: “*Professionally qualified teachers consist of two closely related parts-teaching skills and knowledge of the subject they teach. For vocational education and training (VET) teachers, these two parts mean dual professional competence, as knowledge in VET vocational subject means professional competence or professional competence*” (Andersson et al., 2018). Here is an example of RUS student upgrading activities with Woody Woodman and collaborative learning activities shown in Picture 3.



Picture 3 Upgrading RUS students with Woody Woodman and Collaborative learning

Interview with head of expertise Rico Ardiansyah about invited teachers or teaching practitioners invited by RUS: "Woodman taught basic drawing including lines, shading, human anatomy, then also story boards. Woodman specializes in story boards, and he made the Mulan and Tarzan story boards. "However, he had a high grade because he is also a lecturer at Lasalle Singapore, so the children were a bit confused," So SMK RUS also invited from ITB. So before entering Woodman's material, the children were taught first by lecturers from ITB." (Interview 10 September 2022).

*Teaching factory* learning is carried out collaboratively in one division in a pleasant studio and learning space. According to Sadik, (2008) the use of technology can encourage deeper student involvement with learning materials, and the availability of space to increase collaboration between students is the desired result. Research conducted by Bimantoro et al., (2018) stated that collaborative learning with the discussion method can improve students' socio-cognitive. This collaborative approach is also applied to the authentic assessment

model by involving colleagues. Based on the model developed by Surahman et al., (2018) that the peer collaborative authentic assessment design is believed to be able to improve the learning process, especially learning evaluation. The fun practice space in the *teaching factory* is shown in Picture 4.



Picture 4. Practical Room *teaching factory*

The practice room is fun and is designed like a hotel lobby to make students feel at home in the practice room. Infrastructure for 3D filmmaking industry standards. A pleasant learning space in *teaching factory* learning is shown in Picture 5.



Picture 5. A study room that supports creativity and comfort

The learning process used the *teaching factory* model through *Project based Learning* by combining general material (normative and adaptive) with theme-based productive / vocational material (thematic). Based on the results of learning interview research at RUS, the material taught is only the essential curriculum. Integrated material content and focus on productive materials (projects). Learning leads to thematic learning where learning themes, both content, learning models, visual aids, environment, and others, are adapted to vocational themes. The school movement is fun with fun learning patterns, students feel missed and happy with their teacher. The concept used is the concept of learning like kindergarten children. Play while studying. How to change the pattern 15 -18-year-olds enter with their world. Involved the world they like, educate in their time. The teacher must adjust the students not the students who adjust the teacher. The paradigm has changed, when previously cell phones were banned, now it is permissible to bring cellphones into learning. If they like hanging out in cafes, take them to cafe-style learning. Quality of applicable material, play patterns, learning content by playing, changes in the teacher's role as a facilitator and friend, and management of feelings with the psychology of teachers and students.

The digital talents of Raden Umar Said Kudus Vocational High School students can create international-class animated films. Behind it all because there are sophisticated school facilities and an extraordinary school curriculum. In the school building complex, there is an animation studio at SMK RUS. The building was designed to be a practice space for students to make international-class animated films. The studio building is conceptualized as the original. Starting from there is a room for film production, a mini cinema, to a music studio. The practice room is set as a *teaching factory*. Animation practice students are set up like a real animation industry. RUS SMK is equipped with complete and sophisticated facilities.

From the animation room, recording and sound editing room, color grading room, mini theater, and others. Not only that, the studio is also equipped with rest facilities for students. The hope is that the students can be comfortable and can create their inspiration. Equipped with rest facilities such as slides, there is a library, there is a VW car behind, there is a billiard table, so it is indeed set so that children experience working in the real animation industry, they study comfortably in different rooms, then their inspiration will emerge and they are comfortable.

Interview with M. Asmi Maulana, a productive teacher of vocational animation and mentor teacher at SMK RUS: "If most classrooms or practice rooms students get bored and tired quickly, then SMK RUS is different. Classrooms to practice rooms were designed to be very luxurious and comfortable, so that they are more like a hotel lobby than a class. Classrooms are also arranged with various themes, such as games, animation, to photography which are very comfortable and support animation design work and the like. At RUS animation there is an animation room, recording and sound editing room, color grading room, mini theater. There are even classrooms that face the view of Mount Muria directly." (Interview 17 September 2022).

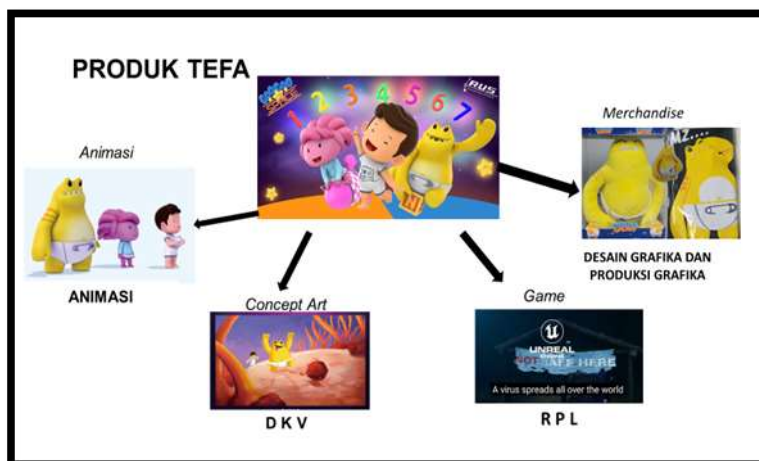
Facilities at SMK RUS are equipped with complete and sophisticated facilities, from animation rooms, recording rooms and sound editing, color grading rooms, mini theater, and others. Not only the practicum room, but there is a sports room (gym) and places with unique designs that are deliberately made to relax students. Students really feel at home studying at school until late at night because the education system is fun and balanced between practice and theory.

Interview with Head of 3D Animation Pro: Rico Ardiansyah regarding the assessment system in RUS as follows: "The Assessment System is a competency test in the form of a final assignment. Collaborated with school exams in a thematic form where the making

of a short film as UKK, was tested together by all the teachers who teach in class. Final Project Report as an exam for the Indonesian language subject, in which there is a calculation of the price of filmmaking services as an exam for Mathematics, setting the story for an exam for History, Arts and Culture, Civics, and Religious-Ethical Education. Furthermore, students presented in 2 languages as English and Javanese subject exams. The final stage is an exhibition (work title) that displays TA preparation activities from planning, production processes to finished products. This opportunity is also used as a promotional event by inviting junior high school teachers and students and the

surrounding community” (Interview 17 September 2022)

The benefits of teaching factories are strengthening skills, training interpersonal communication skills and realizing direct knowledge and work training to enter the real world of work (Hadlock et al., 2008). In line with that, Siswanto, (2011) emphasized that the benefits of teaching factories are: (1) giving students more opportunities to practice skills in *teaching factory* activities; and (2) can contribute to increasing the entrepreneurial spirit by involving students directly in the entire business process starting from planning, production, and marketing. An example of Tefa product results from Raden Umar Said Kudus Vocational School can be seen in Picture 6.



Picture 6 Product Tefa from SMK Raden Umar Said Kudus

*Teaching factory* learning must use job sheets, block schedules, products, and markets. SMK RUS is targeting from Tefa products to receive an income of Rp. 350,000,000 per month for school operational costs. Existing expertise programs have tefa products that support one another. An example of one of the *teaching factory* learning processes is making the Sabda Alam 3D film for a *teaching factory* with personnel involved 95 students from 3 batches under the guidance of 14 teachers. The project took almost 2 years due to the pandemic which should have been completed in 9 months. The process is done by SMK students, but the

process was the same as making films in the industry. The process:

#### a. Development Process

It consists of discussing ideas, preparing story lines and research (reading books, browsing the internet, and observing the Cikanangan captivity to see how birds fly, how birds turn, birds eat and all about the anatomy of these birds.

#### b. Pre Production Process

Writing scripts, concepts and story boards, Concept artists create environments and characters. If the story board makes the camera angle the direction of movement from this scene to this scene, the transition.

Next go to the model team. The modeler team will create a 3D model according to the concept that has been given. The modeling team must have good artistic and technical skills. One of them is the anatomy of the bird so that the results look real. The next process is texturing and shading. In this section, the characteristics of the object will be added. The final stage in the pre-production process is rigging. The process of attaching bones to objects so they can be moved. Of course, the resulting movement must match the actual movement. It is impossible to turn this entire process into a film, relying only on hard skills because it involves many students with diverse skills and a tight deadline. Everyone is required to have high soft skills or soft skills. They must communicate and collaborate across divisions. For example, how to communicate and collaborate between divisions, and have creativity and ability to solve complex problems, be good at self-management, and have persistence so that this project can be completed on time.

### c. Production Process

In this production process, there is a layout process then an animation process. The animation team will move the objects and characters that have been provided in the 3D scene, and they must move these objects as natural and as original as possible. After the animation process is complete, it will proceed with the lighting and rendering process. Along with lighting and rendering, there is also a visual effects division. The visual effects make water, clouds, and feathers for the bird characters in Sabda Alam. They must do R&D (Research and Development) with mentors. For making cloud automation and for grooming the bird's feathers. They must comb the bird's feathers to match the flow. After the lighting rendering and VFX processes are complete, proceed with the compositing process.

### d. Post-Production

In this process there is online editing, that was color grading and motion graphics. The

Sabda Alam animation uses Sabda Alam song lyrics from Crisye. Eva Celia as the Yellow-crested Cockatoo, Fadly Padi as the Bali Starling, Mytha Lestari as the Female Hornbill. Mario Ginanjar as the Geling Ekek. Leisha Ramadhania as a hornbill's daughter.

*Teaching factory* product at SMK RUS Animated film by SMK RUS Kudus entitled Unstring Your Heart(full production). This film was nominated for The 20th Kansas International Film Festival 2020, Canberra Short Film Festival 2019, Pune Short Film Festival 2019, and won the 2019 HelloFest event. Other *teaching factory* products that have been produced by SMK RUS are Wakakibo (full production), Sabda Alam (full production), Bank Central Asia (full production), Coca Cola (Ar Animation), Toyota Astra Mobil (full production), The Virus (full production), Banda The Dark Forgotten Trail (CGI), Alvin and The Chipmunk (Modelling), J Team (Render), Angkasa Pura (full production), Counting With Paula (Modelling), Changi Airport (Modelling), Daihatsu (full production), Indonesian Folklore (Production-Post Pro), Lilin 2 (full production), Mola TV (Full 3D), Pokojang (full production), and Si Unyil (animation).

## CONCLUSION

Based on the findings of the data and discussion, it can be concluded that the learning process uses a *teaching factory* based on *project based* learning (PjBL) and PBL. A real project-based *teaching factory* develops the entrepreneurial spirit of its graduates. Understanding the theory is done with practice. Students find conceptual understanding after going through the practical process in the studio. The *teaching factory* is carried out collaboratively in one division. Fun studio and learning space by combining general and productive material (thematic learning) with the essential curriculum. Learning is supported by complete and sophisticated facilities from the animation room, recording room, sound editing, color grading room, mini theater,

sports room (gym) and a unique room designed for relaxing. *Teaching factory* learning uses job sheets, block schedules, there are products and markets with assessments in the form of final assignments and work exhibitions. Industrial learning with a block learning system with learning target achievements determines the duration of learning time. Curriculum development carried out at RUS begins with: 1) integrated/synchronous curriculum alignment with industry; 2) essential curriculum (non-productive curriculum that supports major material); 3) material for one competency in the major concerned.

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