Research of Material Sciences: The topics of interest of IC-DAEM 2018 included but were not limited to: materials design, development of synthesis and characterization method, experimental and computational work related to this topic, application aspect of engineering materials including materials degradation and failure analysis. Four keynote lectures were delivered on the topics of Production of Rare Earth OrthoFerrites from end-of-life Nd Magnets, Characterization of Calcium Phosphate Ceramics Synthesized by Heterogeneous Nucleation for Artificial Bone Substitutes, Development of Steel Matrix Composites Used for Metallic Die, and Effective Steps in Performing Failure Analysis. Papers presented in IC-DAEM 2018 are included in this proceeding after going through peer reviewing process. This proceeding contains papers with broad topics on design and application of engineering materials, such as Inspection, Maintenance, Techniques and Managements, Method and Case of Engineering Failure Analysis, Time Dependent Properties and Degradation of Engineering Materials, Computational Modelling and Simulation, Development of Synthesis and Characterization Methods, Laboratory and Full Scale-Scale Experiments, Materials and Alloy Design, and Materials Property Improvement. We hope that these papers will immensely benefit the research community working in Materials Science and Engineering, both in the academic and industrial fields. The use of animated multimedia in vocational schools in Indonesia is still not optimal, this is due to the lack of innovative teaching materials, especially multimedia-based instructional materials. This study aims to apply the results of the development of innovative teaching materials based on engineering animated image Multimedia for Vocational High Schools especially in the competence of Mechanical Engineering expertise. Meanwhile, the specific objectives to be achieved in this study are: applying innovative teaching materials in the form of Multimedia Animation Engineering Drawing (MMAED) to improve vocational students' competence. Measuring the level of vo-cational students' competence in engineering image material, especially orthogonal projection material. The method used in this application is using the Experimental method, namely by directly testing the product of Multimedia Animation Engineering Drawing (MMAED) to schools that have mechanical engineering competencies in Indonesia. From the application of Multimedia Animation Engineering Drawing (MMAED), students can increase their competencies in engineering material, especially orthogonal projection material. Traditional teaching methods are currently largely abandoned by many teachers because they make the learning process ineffective and inefficient for students. The society development and technology advances make multimedia widely used in the world of education, so it plays an important role in human life today. The use of multimedia in teaching, especially through text, images, animation, sound, video, and interactive networks can stimulate student enthusiasm in learning effectively and efficiently and help with learning difficulties. In modern economic and socio-cultural situations, the quality of education is a strategic factor in innovative developments in Russia. Higher education innovation in vocational schools is very important to do to answer the challenges of modernization and development based on the needs of modern reality. Unlike the curriculum in Turkey, secondary schools use alearning style consisting of visual, auditory and kinesthetic. The active role of students is important in applying this curriculum. In some machine drawing engineering vocational schools in Indonesia that were met by researchers, in general, the teaching system was still conventional.

This means that the learning process is still teachercentered, so that if the teacher does not enter to carry out learning then students only do the assignments given. Teachers who still have a lot of time to explain the assignments given will be discussed at the next meeting. However, from observations made by researchers, many teachers did not discuss the as-

signments given so that many students complained of not understanding the assigned material. Therefore, teaching media is needed in the form of innovative teaching materials to facilitate the achievement of learning objectives. The results of Baukal's research, Charles E., Ausburn J., & Lynna show that workers who continue their higher education state that they really like multimedia animation in delivering material. This is supported by the results of Rhodes E. study in America that the students who study in the fields of science, technology, engineering, and mathematics stated that the use of multimedia animation and narrative greatly benefits students in learning compared to the use of static images and text. The results of the García-Rodicio & Héctor study show that 97 undergraduate students learning about tectonic plates that use multimedia animation trigger students to think critically so students ask questions about the material delivered through multimedia animation. Multimedia animation offers new insights into learning machine learning analysis techniques about student learning trajectories in the learning environment so students have more complex and open thinking. This is supported by the results of the study of Katsioloudis, Dickerson, Jovanovic, & Jones that the use of multimedia animation in learning and teaching results in differences in the ability of better spatial visualization in mechanical engineering students. Chiou, Tien, & Lee's research results state that animated multimedia teaching materials improve learning achievement, retention, and learning satisfaction better. While the results of other studies conducted on electrical employees, training methods based on multimedia animation technology and equipped with computer software and database technology increased the efficiency of learning electricity employees and greatly reduced training costs. In addition, the results of research by Fratandha, Suherman, & Komaro, showed that the use of multimedia animation was able to improve critical thinking skills in learning metal reinforcement materials in engineering material courses. The results of the study by Hadibin, Purnama, & Kristianto, show that the use of learning media applications in network computer techniques makes the delivery of lessons more varied so that students are easier to understand the material, interesting, and not boring. The difficulty of engineering students in engineering courses related to abstract learning material requires the instructor to make interactive learning media in the form of multimedia animation so that the learning material is easily understood by students From several results of the research mentioned above that the use of multimedia animation has many advantages over conventional learning. These advantages include increasing student learning achievement, student learning satisfaction increases, students can learn independently. The research method used is quasi-experimental research method (quasi-experiment). The design of the quasi-experimental study used was the research design of Nonequivalent Control Group Design. This is because the subject used is complex human and it is difficult to control internal and external factors that can affect variables. For this reason, this method is considered to have the stability to provide accurate information obtained and approach real experiment research whose conditions are difficult to fulfill in educational research. Experiments carried out in two classes, namely the experimental class using multimedia animation and control classes using media images. In the design of this study, there were two groups consisting of the experimental group and the control group. Both groups were given pre-testto find out the initial state, whether there is the difference between the experimental group and the control group.