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Virtual-Microteaching on Search-Analyzing-Practicing-Reflection (SAPR):

Alternative Approach in Developing Physics Student Teaching Skills in the COVID-19 Pandemic

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***Abstract*—This study aims to find alternative learning in the COVID-19 pandemic situation, where the government forbids the implementation of lectures on campus (classes), while lectures must continue. One of the subjects in charge of developing teaching skills or teaching skills is microteaching. Virtual microteaching based on Search-Analysis-Practicing-Reflection (SAPR) activities may serve as an alternative in developing teaching skills of prospective science-physics teacher students. The model was developed using the Tessmer approach and validated by educational technology media experts from several universities in the province of Jambi-Indonesia. The trial was conducted on a group of prospective science-physics teacher students. Based on the results of research, virtual microteaching with all its stages can be used as an alternative in improving teaching skills of prospective science-physics teachers.**

Keywords—virtual microteaching, Search-Analyzing-Practicing-Reflection (SAPR), prospective teacher students

I. INTRODUCTION

Teaching skills are one of the most fundamental skills that must be possessed by teachers and prospective teachers. Good teaching skills will guarantee the quality of the learning process and student success in learning. Conversely, teachers or prospective teachers who have low levels of teaching skills, they will not be able to develop a quality learning process, which is a learning process that is able to explore the full potential of learners optimally [1]. Teaching skills also found significantly affect the effectiveness and efficiency of the learning process [2,3]. In addition, teaching skills mastered by teachers also affect student learning motivation [4,5], student readiness [6] and student learning outcomes [7,8].

There are some basic teaching skills that required to be mastered by a teacher including of questioning skills, reinforcement skills, varying skills, explaining skills, opening and closing lessons, small group discussion skills, classroom management skills, small and large group teaching skills [9], opening and closing lessons, asking questions, giving reinforcement, and holding variations in teaching [10]. Other skills that should be improved by both preservice teachers and teachers are the development of teaching materials [11,12], learning models [13], lesson studies [14], and blended learning approach [15] in conducting remote-teaching processing.

One of the courses that aim to develop teaching skills of prospective teachers (physics) is microteaching. Microteaching is one of the lecture activities or models of teaching [16] whose main purpose is to train and develop teaching skills. Through microteaching activities prospective teacher students are trained to recognize various teaching techniques and then apply them in the form of teaching exercises [17] so that they have the confidence to teach [18-20]. Research also proves that micro teaching activities are effective in developing basic teaching skills of prospective teachers [21]. In addition, in this microteaching activity, prospective teacher, students are also trained to deliver material (physics content) with various learning sources and various media. Therefore, at the end of microteaching lectures, prospective teacher students are expected to be ready to become professional teachers [22].

As one of the compulsory subjects and has a very urgent and strategic position in developing teaching skills of prospective physics teacher students, microteaching should be carried out with the support of good facilities. This is in line with the opinion that microteaching must be managed and developed continuously and systematically [23]. In the context of learning physics-teacher must not only have the ability to teach well verbally, but must also have the ability to use various learning media as a means of achieving scientific concepts that are often abstract. Therefore, teachers and prospective teachers of physics must have the ability in terms of using laboratory equipment properly, utilizing the environment as a source and learning tool for students so that the concepts of physical science can be mastered by students. Thus the implementation of microteaching should be carried out with this support.

In certain situations, for example, at the moment, namely the COVID-19 pandemic and the implementation of work from home or learning from home and the application of social and physical distancing, microteaching cannot be carried out optimally. Prospective teacher, students cannot be directly and jointly trained in a particular room to develop their teaching skills, both in terms of teaching techniques, using laboratory equipment and so on. Thus, this situation is feared teaching skills and the ability of prospective science-physics teachers to use practical equipment and other media use decreases. Therefore, there must be an alternative to ensure that the teaching skills of prospective students of science-physics can be maintained, or even better.

One effort to develop teaching skills of prospective science-physics teachers in certain situations, such as the COVID-19 pandemic, the implementation of work from home or learning from home and the application of social and physical distancing, so that lectures cannot run as usual by using virtual microteaching, namely the implementation of internet-assisted microteaching. In the era of the industry 4.0 revolution, teachers should master internet-based learning skills to support the implementation of their learning to be of higher quality [24]. Here, the online microteaching can improve the teaching abilities of prospective teachers [25].

Implementation of virtual microteaching is believed to have many advantages and advantages. This is based on the results of previous research that virtual learning can improve students' critical thinking skills [26], increase activities and learning to improve the quality of the learning process [27], and can improve the mastery of concepts science-physics concepts [28]. Therefore, the use of virtual microteaching is believed to be able to develop the teaching skills of prospective science-physics teacher students.

In order to run optimally Virtual microteaching must be designed so that prospective science-physics teacher, students have the opportunity to develop their teaching skills optimally. One model of the implementation of virtual microteaching in order to develop teaching skill of prospective physic teacher is based on Search-Analysis-Practicing-Reflection (SAPR). With the combination of the four integrated steps, the process of implementing virtual microteaching will run systematically.

Referring to the description above, the focus of the research is to develop Virtual microteaching based on Search-Analyzing-Practicing-Reflection (SAPR) activities as an alternative learning in developing teaching skills of prospective science-physics teacher candidates.

II. Research Methods

The development of a virtual microteaching learning model based on Search-Analyzing-Practicing-Reflection (SAPR) activities in this study uses the Tessmer approach. The stages carried out in this development are planning, model development, initial reflection, revision, judgment expert-revision-implementation. The planning stage begins with a needs analysis, which is related to teaching skills of prospective science-physics teacher students and alternative learning implementation. At the stage of model development is carried out on the basis of the analysis of the needs and effectiveness and efficiency of the model to be developed. At this stage an initial model of virtual microteaching learning based on Search-Analyzing-Practicing-Reflection (SAPR) activities is obtained. In the next stage, the model is brought and discussed with education experts, in this context the learning media expert will obtain input for the desired SAPR-based Virtual microteaching capability. After making improvements according to expert advice, the final step is to be implemented in a group of prospective science-physics teacher students to find out the impact of using the model with their teaching skills.

III. Result and Discussion

As mentioned above, SAPR-based virtual microteaching is an internet network-assisted microteaching learning activity with the main activities: 1) search, i.e. searching for and finding sources, learning materials and media, including appropriate learning videos, according to material physics content, 2) analyzing, namely conducting an analysis of learning sources, materials and media, including learning videos that were found previously. This activity aims to find strengths, weaknesses and possibilities to be applied in their learning, 3) practicing, namely the activity of practicing the findings and analysis that have been done, through a learning process that they do by recording on a video, which is then applied to *whatsapp* group, and 4) reflection, is the final stage of this model that is reflecting videos that have been installed by students so that weaknesses and weaknesses are known and suggestions for improvement are given. A more complete process of the four stages of implementing SAPR-based virtual microteaching is shown in Figure 1.

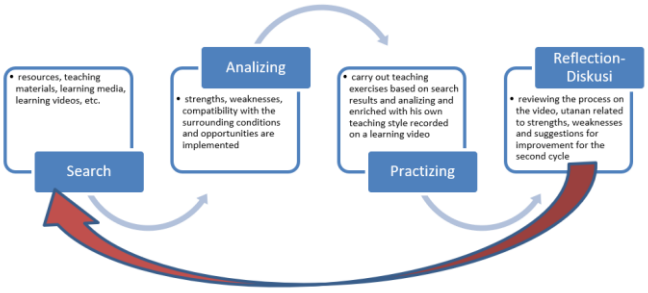

Fig. 1. The process of implementing Virtual Microteaching based on SAPR. A red arrow indicates that the process is in the form of a cycle.

Before the SAPR-based virtual microteaching model was implemented in prospective science-physics teacher students, it was first shown and discussed with experts, who in this context were educational technology experts from well-known tertiary institutions in Jambi province. This is intended not only to validate the SAPR-based virtual microteaching model developed, but also to obtain input so that the model is more perfect, effective and efficient when in use. After being validated and revised on the basis of advice from experts, then SAPR-based virtual microteaching can be applied.

The implementation of SAPR-based virtual microteaching is a recurring cycle (Figure 1). The implementation begins with a search activity that is an activity to find sources, teaching materials, learning media, learning videos and so on which are carried out in a virtual manner that is shared by the internet network. This process allows the discovery of resources, materials, media and videos of learning physics-physics from various parts of the world so that the results of search activities are more varied. Variety of teaching materials and learning resources will enable the formation of effective and creative learning in responding to the unique learning styles of students [29]. Search activities are carried out by lecturers and based on virtual data which are then shared in *whatsapp* group for the analyzing stage.

The ability of analysis is a high level of ability [30] and is needed as one of the main assets to become a professional teacher [31]. Therefore, one of the steps in implementing virtual microteaching is an analysis activity. In the analyzing phase, it is done by students and is guided by virtual lecturers using the zoom application and *whatsapp* group. The final result of this activity is students know the strengths, weaknesses, suitability of search results with the surrounding conditions and opportunities implemented. Furthermore, at this stage each participant (student teacher candidate) is asked to make a learning plan that is in accordance with the results of the analysis and is ready to be implemented on certain material (physics content)

Next, the practicing or implementation stage, which is practicing or implementing a learning plan that is developed based on the results of the analysis. Therefore, the practicing stage is an important stage and is part of this SAPR-based virtual microteaching model. The teaching practices affect the teaching readiness of prospective teachers [32], and teacher professionalism [33]. The practice or implementation, besides being based on prior planning (as a result of analysis) also is enriched with the teaching style of each participant. In this process all learning activities are recorded on a video which is then shared on *whatsapp* group so that it can be seen by other participants.

The final stage of the virtual microteaching model is reflection-discussion. Reflection is a process to assess one's own abilities, so that reflection activities involve self-efficacy [34] and metacognition [35], thus this process is very important and very influential on someone's performance [36]. Therefore, virtual microteaching makes it part of the model. This is in line with the opinion of Straková and Cimermanová [37] that the virtual environment can be used to develop the reflective attitude of prospective teachers.

At this stage, each participant was asked to comment on his own learning video, mainly related to strengths, weaknesses and suggestions for improvement for the second cycle. In addition, each participant was also asked to comment on two of their peer videos and provide the best advice. Every participant who gets a suggestion is obliged to give a response, answer, reject or accept a suggestion from another participant. Activities at this stage are also carried out virtually with the help of the zoom application and *whatsapp* group.

Each virtual microteaching cycle requires 2 meetings. Each cycle, material, media, video and science-physics content used is different. This is intended to enrich the insight and knowledge of prospective science-physics teacher students to increase teaching skills. Thus, for one semester several cycles can be carried out, so that the level of teaching skills of the prospective science-physics teacher students can develop properly. To see the development of teaching skills is based on a learning video that they developed themselves at the end of the session, which is cycle 4.

Referring to the description above, it can be understood that virtual microteaching can be used as an alternative in improving the teaching skills of prospective science teacher students, including in this COVID-19 pandemic situation. This finding is in line with the research results of Ashoumi and Mochammad [38] and Nurfalah [39] that virtual-based learning can improve student learning activities and mastery of science-physics concepts, for example the concepts of momentum and impulses [28]. Besides this research is also in line with Banindro's [40] research that website-based virtual learning as an engineering learning media can be used to improve student learning outcomes. Therefore, Nurfalah [39] states that it is necessary to optimize virtual e-learning as a medium for learning physics-physics, as well as Dixon [41] states that virtual technology can be used as microteaching in rural areas.

IV. Conclusion

Based on the description above it can be concluded that virtual microteaching based on Search-Analyzing-Practicing-Reflection (SAPR) activities can be used as an alternative in

order to improve the basic skills of teaching prospective science-physics teachers. This is based on the results of expert assessments that the virtual microteaching model can be used as a guide in improving the teaching skills of prospective science-physics teachers. In addition, the stages of the model are systematically supported by the results of research. However, broadly implementation of the virtual microteaching models based on Search-Analyzing-Practicing-Reflection (SAPR) was required to prove its effectiveness in developing the students' teaching skills.

REFERENCES

[1] M. Nasution, "Dasar-Dasar Keterampilan Mengajar Matematika," Studi Multidispliner: Jurnal Kajian Keislaman, 2015.

[2] A. Remesh, "Microteaching, an efficient technique for learning effective teaching," Journal of Research in Medical Sciences, 2013.

[3] Susanti Rani and A.Z. Setyosar Punajii, Persepsi mahasiswa teknologi pendidikan universitas negeri malang tentang Pentingnya keterampilan dasar mengajar terhadap kompetensi lulusan teknologi pendidikan. Persepsi Mahasiswa Teknologi Pendidikan Universitas Negeri Malang Tentang Pentingnya Keterampilan Dasar Mengajar Terhadap Kompetensi Lulusan Teknologi Pendidikan, 2018.

[4] E. Safitri and U.T. Sontani, "Keterampilan Mengajar dan Komunikasi Interpersonal Guru sebagai Determinan terhadap Motivasi Belajar Siswa (Teachers Teaching Skills and Student Learning Motivation as a Determinant of the Learning Skills)," Jurnal Pendidikan Manajemen Perkantoran, 2016.

[5] W.I. Sitorus and J. Sojanah, "Meningkatkan Motivasi Belajar Siswa Melalui Keterampilan Mengajar Guru," Jurnal Pendidikan Manajemen Perkantoran, 2018.

[6] D. Alwiyah and N. Imaniyati, "Keterampilan Mengajar Guru Dan Kesiapan Belajar Siswa Sebagai Determinan Terhadap Hasil Belajar Siswa Teachers Teaching Skills And Student Learning Readiness As A Determinant of The Student Learning Outcomes," Jurnal Manajerial, 2018.

[7] F. Budiman and A. Irianto, "Pengaruh Motivasi Mengajar Guru dan Keterampilan Mengajar Guru terhadap Hasil Belajar Siswa SMA Negeri di Kota Bukittinggi," Jurnal Kajian Pendidikan Ekonomi, 2015.

[8] B.D. Theodora, "Pengaruh Keterampilan Mengajar Guru Terhadap Hasil Belajar Siswa SMA Se-Kota Malang Yang Di Kontrol Dengan Variasi Sumber Belajar," Journal of Accounting and Business Education, 2016.

[9] M.R.D. Wahyulestari, Keterampilan Dasar Menagajar Di Sekolah Dasar. Prosiding Seminar Nasional Penelitian, Pendidikan Dan Penerapan MIPA, 2018.

[10] D. Alwiyah and N. Imaniyati, "Keterampilan Mengajar Guru Dan Kesiapan Belajar Siswa Sebagai Determinan Terhadap Hasil Belajar Siswa Teachers Teaching Skills And Student Learning Readiness As A Determinant of The Student Learning Outcomes," Jurnal Manajerial, 2018.

[11] L. Luzyawati, "Profil Tingkat Penguasaan Keterampilan Dasar Mengajar Mahasiswa Calon Guru Biologi," Jurnal Pengajaran Matematika Dan Ilmu Pengetahuan Alam, 2015.

[12] A. Kurniawan and Masjudin, Pengembangan Buku Ajar Microteaching Berbasis Praktik untuk Meningkatkan Keterampilan Mengajar Calon Guru. Asosiasi Pendidik Dan Pengembang Pendidikan Indonesia (APPPI), 2017.

[13] D.V. Rahayu, "Pembelajaran Dengan Strategi Search-Solve-Create-Share Untuk Melatih Keterampilan Dasar Mengajar Matematika," Mosharafa: Jurnal Pendidikan Matematika, 2018.

[14] R. Lestari, "Pengaruh Model Lesson Study Terhadap Kemampuan Dasar Mengajar Mahasiswa Biologi Universitas Pasir Pengaraian," Bio-Lectura, 2018.

[15] S. Chookaew, S. Howimanporn, P. Pratumsuwan, W. Sootkaneung and C. Wongwatkit, "Improving pre-service engineerng teacher's teaching skills with a blended micro-teaching technique," Proceedings - 2019 International Symposium on Educational Technology, ISET 2019, 2019.

[16] A. Harris and A. Harris, "Models of teaching. In Teaching and Learning in the Effective School, 2019.

[17] M. Ambarawati, "Analisis Keterampilan Mengajar Calon Guru Pendidikan Matematika Pada MataKuliah Micro Teaching," PEDAGOGIA: Jurnal Pendidikan, 2016.

[18] K. Bilen, "Effect of Micro Teaching Technique on Teacher Candidates' Beliefs regarding Mathematics Teaching," Procedia - Social and Behavioral Sciences, 2015.

[19] Z. Arsal, "Microteaching and pre-service teachers' sense of self-efficacy in teaching," European Journal of Teacher Education, 2014.

[20] D.M. Azizah, Sugirin and A. Triastuti, "The beliefs and practices: Teyl microteaching at elementary school in Indonesia [Las creencias y prácticas: La microenseñanza teyl en la escuela primaria en Indonesia]. Opcion, 2019.

[21] I. Setiawan, "Efektivitas Mata Kuliah Pembelajaran Mikro (Microteaching) Terhadap Keterampilan Dasar Mengajar Dan Kesiapan Mengajar," Jurnal Penelitian Pendidikan Dan Ekonomi, 2018.

[22] Y. Yuanita, "Tingkat Keterampilan Dasar Mengajar Calon Guru Sekolah Dasar Pada Perkuliahan Mikroteaching [Level of Basic Skills for Teaching Prospective Primary School Teachers at Mikroteaching Lectures]," PEDAGOGIA: Jurnal Pendidikan, 2019.

[23] A.H. Lubis and R.A. Siregar, "Efektivitas Sistem Pengelolaan Microteaching Dengan Siklus Penetapan, Pelaksanaan, Evaluasi, Pengendalian Dan Peningkatan (Ppepp) Dalam Meningkatkan Keterampilan Mengajar Calon Guru Institut Pendidikan Tapanuli Selatan," Jurnal Education and Development, 2019.

[24] D. Lase, "Pendidikan di Era Revolusi Industri 4.0," SUNDERMANN Jurnal Ilmiah Teologi Pendidikan Sains Humaniora Dan Kebudayaan, 2019.

[25] U. Kusmawan, "Online microteaching: A multifaceted approach to teacher professional development," Journal of Interactive Online Learning, 2017.

[26] R. Pratama, "Modul Virtual Berbasis Inkuiri Terbimbing Untuk Meningkatkan Kemampuan Berpikir Kritis," EDUSAINS, 2019.

[27] M. Rohmah, S. Ibnu and E. Budiasih, "Pengaruh Real Laboratory Dan Virtual Laboratory Terhadap Kualitas Proses Pada Materi Kesetimbangan Kimia," Orbital: Jurnal Pendidikan Kimia, 2019.

[28] A.I. Juliansyah, A.F. Lukman, and Nana, "Pemanfaatan Bit.Ly Dalam Strategi Pembelajaran Simulasi Virtual Untuk Meningkatkan Penguasaan Konsep Momentum, Impuls, Dan Tumbukan," Jurnal Unnes, 2018.

[29] H. Sine, "Peran Pendidik Dalam Menghadapi Keragaman Gaya Belajar Murid," Pengarah: Jurnal Teologi Kristen, 2019.

[30] H.D. Dinni, "HOTS (High Order Thinking Skills) dan Kaitannya dengan Kemampuan Literasi Matematika," Prisma, 2018.

[31] Suyati, "Meningkatkan Peranan Guru Profesional Dalam Menghadapi Era Revolusi Industri 4.0," Prosiding Seminar Nasional Pendidikan Program Pascasarjana Universitas Pgri Palembang, 2019.

[32] I.D. Kurniasari and D. Rahmawati, "Pengaruh Minat Menjadi Guru Dan Praktik Pengalaman Lapangan (PPL) Terhadap Kesiapan Mengajar," Jurnal Kajian Pendidikan Akuntansi Indonesia Edisi 2, 2016.

[33] B. Sulistyo, M.M. Minarsih and M.M. Warso, "Pengaruh Pendidikan Dan Latihan Profesi Guru (Plpg), Kedisiplinan Guru, Dan Kompetensi Guru Terhadap Kinerja Guru Di Smp Masehi Jepara," Journal of Management, vol. 2, no. 2, 2016.

[34] H. Savolainen, P. Engelbrecht, M. Nel and O.P. Malinen, "Understanding teachers' attitudes and self-efficacy in inclusive education: Implications for pre-service and in-service teacher education," European Journal of Special Needs Education, 2012.

[35] A. Efklides, B.L. Schwartz, and V. Brown, Motivation and affect in self-regulated learning: Does metacognition play a role? Handbook of Self-Regulation of Learning and Performance, 2nd Ed, 2018.

[36] S. Coutinho, "Self-efficacy, metacognition, & performance," North American Journal of Psychology, 2008.

[37] Z. Straková and I. Cimermanová, "Developing reflective skills of student teachers in the virtual learning environment," Electronic Journal of e-Learning, vol. 16, no. 2, pp. 107-121, 2018.

[38] H. Ashoumi and S.S. Mochammad, "Peningkatan Aktifitas Belajar Mahasiswa dengan Media Pembelajaran Kelas Virtual Google Classroom," Prosiding Seminar Nasional Teknologi Dan Sains (SNasTekS), 2019.

[39] E. Nurfalah, "Optimalisasi E-Learning berbasis Virtual Class dengan Google Classroom sebagai Media Pembelajaran Fisika," Physics Education Research Journal, 2019.

[40] B.S. Banindro, "Pengembangan Techno Virtual Berbasis Website sebagai Media Pembelajaran Rekayasa Visual Blender 3D bagi Mahasiswa Desain Produk," ANDHARUPA: Jurnal Desain Komunikasi Visual & Multimedia, 2019.

[41] R. Dixon, C. Hall and F. Shawon, "Using Virtual Reality and Web Conferencing Technologies: Exploring Alternatives for Microteaching in a Rural Region," Northwest Journal of Teacher Education, 2019.