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The development of video analysis instrument to determine teacher's character

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Abstract. This study aims to develop a valid and reliable video analysis instrument to determine teachers' character in the opening lesson in terms of its utterances and produce video analysis on micro-teaching that will be used in training related to artificial intelligence (AI). The type of research used is research and development. The subject of this research is the micro-teaching video of class E students' batch 2019, Mathematics Education Study program at Sanata Dharma University. The product of this research is a video analysis instrument to find out the character of the prospective teachers such as confidence, enthusiasm, and happiness in terms of voice utterances. This study uses the ADDIE research model. The results show that the video analysis instrument has a validity value of 4.80 which means it's very valid, video analysis instrument to find out the enthusiastic character has a value of validity 4.70 which means it's very valid, video analysis instrument to find out the character of happiness has validity value of 4.60 which means it's very valid, the practicality of the developed video analysis instrument meets the required criteria with a practicality value of 4.31 and overall, the video analysis instrument developed belongs to an effective category.

1. Introduction

Quality education is also determined by qualified and professional teachers. The quality of a teacher is also shown when managing learning activities. Some of the characteristics of qualified prospective teachers include self-confidence, enthusiasm, and fun. One of the efforts to prepare prospective teachers who are skilled in teaching students with the above characteristics is by holding a Microteaching lecture. According to Helmiati [1], micro-teaching is an activity designed in such a way as to develop the professional experience of prospective teachers, especially teaching skills by minimizing learning aspects such as the number of students, time, the focus of teaching materials, and limiting the application of certain teaching skills, so that various advantages can be identified. and weaknesses in prospective teachers accurately. According to Djamarah [2], four components must be met to open lessons, namely attracting student attention, generating motivation, providing references, and conveying connections. The four components are indicators of skills in opening lessons. When students practice teaching, they are documented in a video and given feedback from both the lecturer and their peers.

Video analysis has been used in several fields of science and research topics. Among them is the field of sociology [3] and the topic of business intelligence [4]. Meanwhile, Artificial Intelligence tools are

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Video analysis has been used in several fields of science and research topics. Among them is the field of sociology [3] and the topic of business intelligence [4]. Meanwhile, Artificial Intelligence tools are

now developing which can potentially be used to analyze video. These Artificial Intelligence (AI) tools include gait recognition [5–10], voice recognition [11,12], and face or image recognition [13–19]. These three tools can be used to analyze videos based on family planning, where each of the three can be developed to assess and provide feedback related to the three characters of prospective teachers, namely confidence, enthusiasm, and fun while managing to learn.

The use of video recording and analysis to help improve the competence of prospective teachers has been widely used [20]. Video recording in micro-teaching lectures is also used as a means to perceive oneself from a point of view outside of oneself [21]. Artificial intelligence-based video analysis is already in use. However, they are still widely used and developed in the business sector. This artificial intelligence-based video analysis is commonly called video analytics . Senior et al. [22], discussed analytical videos for the retail sector (retail trade). This article discusses a set of tools for retail analysis based on a combination of video understanding and transaction logs. Tools are provided for loss prevention (return fraud and cashier fraud), store operations (customer count), and sales (display effectiveness). Gorodnichy et al. [23], discussed video analytics technology, which is in the form of basics and market analysis.

Everyone is expected to have self-confidence because it is important to do both work and life. According to Lindenfield [24], there are two types of self-confidence, namely inner self-confidence and inner self-confidence. Being confident that someone is born makes it possible to appear and behave by showing the outside world that this person believes in himself. According to Iswindharmanjaya & Agung in [25], the characteristics of people who have self-confidence include being responsible for the decisions they make and easily adapting to the environment.

Enthusiasm or comes from the Greek language which means Entheos "God in" or "inspired by God". Ruly Mujahid in [26] argues that enthusiasm is joy, a surge of passion, a great interest in doing something. According to Carr [27], happiness is defined as a positive psychological condition, which is characterized by high satisfaction with the past, high positive emotions, and low negative emotions.

According to Wahyuningtyas [28], non-verbal communication is communication that is carried out by a person because of stimulation when communicating even without making a sound (verbal communication) that has a special meaning. Non-verbal communication can be through tone of voice, gestures, and facial expressions. (Nofrion, 2018) formulates a good voice is a sound that can make listeners feel comfortable or what is better known as a smiling voice. A gesture is a form of non-verbal communication with bodily actions that seem to communicate certain messages. Susan G. Buckley [29] identifies the parts of the body that are directly related to body language. Humans can display emotions in the form of facial expressions. There are six basic human facial expressions: sad, happy, angry, disgusted, afraid, and surprised [30]. Each of these expressions has a difference in the pull of the facial muscles [22]. Facial expressions are the result of facial fast signals [30]. According to Paul Ekman and Wallace V. Friesen in [31], psychological scientists classify facial expressions universally into six main forms of expression. However, expression is a dynamic process that involves various factors including expression, psychological condition, and personal feelings [32].

In preparing qualified teacher candidates, artificial intelligence (AI) also plays an important role. One form of applicative artificial intelligence is a video system that can be found in micro-teaching. The video system in question is a video recording of activities during the micro-teaching of students in the form of audio-visual information. Video recordings contain information about the mastery of subject matter, harmonized movement stimuli (cognitive domains), information on attitudes and emotions (affective domain), and skills information concerning motion, sound, and facial expressions (psychomotor domain). Based on the researcher's experience in the field regarding micro-teaching practice activities, the readiness of prospective teachers is insufficient. There are several problems underlying product development in this research. These problems include the character of prospective teachers when teaching is still weak, including low self-confidence, less enthusiasm, and less fun when teaching.

This problem is sometimes very difficult to realize when the prospective teachers handle the classes so they need a video analysis instrument that can help prospective teachers to know their quality when

teaching. These video analysis instruments will be used in the development of techniques and systems that allow computers to receive input in the form of voice utterances to find out the character of prospective teachers through voice utterances. Realizing the aforementioned facts, the researcher conducted the investigation related to the quality of prospective teachers in micro-teaching practices by focusing on the character profiles of prospective teachers in opening lessons based on video analysis in terms of the sound spoken. The aim is to develop a valid and reliable video analysis instrument to determine the character profile of prospective teachers in opening lessons based on video analysis in terms of the spoken voice and produce video analysis on micro-teaching that will be used in training related artificial intelligence.

2. Research Methodology

The type of research developed in this study is research and development. Product development in this research development uses the ADDIE model which consists of five stages which include analysis, design, development, implementation, and evaluation [33]. The subjects in this study are the micro-teaching videos of Mathematics' students batch 2019 E Classes at Sanata Dharma University. The research was carried out in the micro-teaching room, a mathematics education study program at the Sanata Dharma University. In accordance with the ADDIE development model, the instrument development procedure consists of five stages [34], namely:

2.1 Analysis Phase

Education Policy Analysis. At this stage, an analysis of government policies is carried out in educating competent and qualified teacher candidates.

Syllabus analysis and micro-teaching course guides. At this stage, an analysis of several syllabi and books related to this lecture was carried out in various universities. It will be seen how micro-teaching is designed and implemented.

Reference analysis. At this stage an analysis of references that have been collected from various sources regarding non-verbal communication related to voice and public speaking

2.2 Design Stage

Determining indicators. Determining indicators related to the assessment of one's voice in teaching.

Designing video analysis instruments. In this stage, a video analysis instrument is designed, which includes the anatomy of the instrument, groups of indicators, and relevant scoring.

2.3 Development Stage

At this stage, the instrument is arranged in detail and thoroughly with guidelines for use and scoring to the conclusion. From this result, the draft instrument was then tested in a limited way to see the aspects of readability and practicality of its use. Then a discussion forum is held in a group to obtain suggestions and improvements. From this draft instrument after revision, an effective and practical instrument will be obtained.

2.4 Implementation Stage

Instruments that have been tested for effectiveness and practicality are then trialed for relatively large videos. Trials include:

Use of video analysis instruments. At this stage, instruments that have been produced for each aspect will be applied to analyze videos involving 3 examiners.

The effectiveness of the instrument. From the results of the assessment by the three examiners, it will then be tested whether the average assessment results of the three are the same or statistically different using the Kruskal Wallis test or the One Way Anova test.

2.5 Evaluation Stage

From the results of the instrument validation test above, if it is not yet valid, a group discussion forum, an appraiser with expert colleagues, is used to find out the aspects of invalidity which are subsequently revised and tested for instrument effectiveness to obtain a valid, practical and effective instrument that is acceptable to the relevant parties.

3. Result And Discussion

In the assessment of instrument validation by expert lecturers, as for aspects assessed such as aspects of clarity, the accuracy of content, relevance, the validity of the content, there is no bias and language accuracy. In the assessment of this validity, a Likert scale system from 1 to 5 for the aspect was used. The validity criteria used are 1 - 1.5: very invalid; 1.5 - 2.5: invalid; 2.5 - 3.5: valid enough; 3.5 - 4.5: valid; 4.5 - 5: very valid. Based on the validity assessment of the instrument, it was found that the video analysis instrument to determine the character of confidence had a validity value of 4.80, which means it was very valid, a video analysis instrument to find out the enthusiastic character had a value of validity 4.70, which means very valid, and a video analysis instrument to find out the character happiness has a validity value of 4.60 which means it is very valid. Whereas in the assessment of the practicality of the instrument by the peer examiner, as for aspects assessed such as language and content eligibility. Based on practicality assessment, In the preparation of video analysis instruments, there are indicators used to determine human character based on sound. As for the indicators to determine the character of self-confidence such as intonation, volume, articulation, tempo, power, breath, accentuation, pauses, and pitch. accentuation, breath, and pitch. While indicators to determine the character of happiness such as intonation, volume, articulation, tempo, power, and accentuation [35,36]. In the video analysis instrument, there are 5 statements on the assessment, Sl information means always, Sr means often, KK means sometimes, J means rarely and TP means never [37].

Table 1. Analysis of SPSS output on characters

Character Instruments (level of education)	Normality test	Homogeneous Test	Anova One Way Test	Kruskal Wallis Test	Conclusion (there are different mean/not each examiner)
Confidence (elementary)	Not	-	-	0.489	There is no
Enthusiastic (elementary)	Not	-	-	0.874	There is no
Happiness (elementary)	Not	-	-	0.052	There is no
Confidence (midlde)	Not	-	-	0.377	There is no
Enthusiastic (middle)	Not	-	-	0.505	There is no
Happiness (middle)	Normal	0.927	0.026	-	There is
Confidence (high)	Not	-	-	0.173	There is no
Enthusiastic (high)	Not	-	-	0.191	There is no
Happiness (high)	Normal	0.327	0.006	-	There is
Confidence	Not	-	-	0.334	There is no
Enthusiastic	Not	-	-	0.742	There is no
Happiness	Not	-	-	0.002	There is

In the *video analysis instrument to determine the character of confidence* with a linkerd scale from 1 to 5, the statements of the sound indicators are described to determine the character of self-confidence which consists of positive and negative statements. In the *video analysis instrument to determine the enthusiastic character* with a linkerd scale from 1 to 5, the statements of the sound indicators are described to find out the enthusiastic character consisting of positive and negative statements. In the

video analysis instrument to determine the character of happiness with a linkerd scale from 1 to 5, the statements of the sound indicators are described to determine the character of happiness which consists of positive and negative statements. After the validation and practicality assessment has been carried out, it is continued by conducting an instrument trial using 10 micro-teaching videos at the elementary level. The output of this initial trial shows that the instruments of confidence, enthusiasm, and happiness have been effective with a significance value of more than 0.05 so that video analysis instruments can be tested on a larger scale. The instrument test was then performed using 23 elementary-level micro-teaching videos, 23 middle-level micro-teaching videos, and 23 high-level micro-teaching videos. At this stage, an analysis of character instrument output was analyzed using the SPSS V20 program. The use of the SPSS program aims to determine whether there are differences in the average of each examiner or not. Analysis of SPSS output can be seen in Table 1 above.

Based on the analysis in Table 1, it is known that the SPSS output for the instrument of confidence and enthusiasm character does not have a significant average difference whereas in the character of happiness in junior and senior high school levels, there is an average difference between the three examiners, so a review of the character instrument happiness.

On checking stage, there is a significant difference in the final score on subject 12 (S12) which is located on the sound strength indicator and word/sentence accentuation, so that the happiness character instrument is then revised without using sound strength indicator and word/sentence accentuation. After the happiness character instrument has been revised, it is continued by testing the instrument through the SPSS V.20 program to see the effectiveness of the revised instrument. Based on the SPSS output, it is found that the SPSS output of the Kruskal Wallis test, the revision of the instrument of happiness character at the junior high level has an Asymp value the significance is 0.107 and the senior high school level has an Asymp value Significance of 0.089. This means that the revision of the happiness character instrument does not have a significant average difference, so the happiness character instrument is no longer updated.

4. Conclusion

The results of research and development show that the video analysis instrument to determine the character of confidence has a validity value of 4.80 which means it is very valid, a video analysis instrument to find out the enthusiastic character has a value of validity of 4.70 which means it is very valid, a video analysis instrument to find out the character of happiness has a validity value of 4.60 which means it is very valid, the practicality of the developed video analysis instrument meets very practical criteria with a practicality value of 4.31 Based on the analysis and description above, it is found that the instruments of confidence, enthusiasm, and happiness have fulfilled the validity, practicality, and effectiveness aspects so that it can be said that the products that have been developed are feasible and can be used.

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