Abstract. The performance objectives used for the formative assessment of complex skills are generally set through text-based analytic rubricsc[1]. Moreover, video modeling examples are a widely applied method of observational learning, providing students with context-rich modeling examples of complex skills that act as an analogy for problem solving [1]. The purpose of this theoretical paper is to synthesize the components of video modeling and rubrics to support the formative assessment of complex skills. Based on theory, we argue that application of the developed Video Enhanced Rubrics (VER) fosters learners' development of mental models, quality of provided feedback by various actors and finally, the learners mastery of complex skills.

My name is Kevin Ackermans, a vocational teacher educator from Fontys University of Applied Science. Also, I am a Ph.D. researcher from the Open University of the Netherlands, researching Video Enhanced Rubrics for the formative assessment of complex skills in Dutch secondary education. Generally, I believe video modeling examples are a powerful medium to facilitate learning when employed correctly [2, 3]. Specifically, videos provide tacit knowledge and contextual visual representation of complex skills that are essential to our research [4, 5]. Our research utilizes Mayer's [6] cognitive theory of multimedia learning to synthesize the components of video and rubrics into instructional elements which are accompanied by a peer assessment tool to facilitate formative assessment [7]. The aforementioned educational elements are implemented according to van Merriënboer's [8] 4CID model to foster the learners' development of complex skills, specifically presentation, collaboration and informational literacy skills. The project focusses on designing, developing and testing the video enhanced rubrics and accompanying formative assessment tool to foster the development of the learners' mental models, feedback quality and mastery of complex skills. Cognitive load is of pivotal importance in the combination of video and rubrics. If implemented incorrectly, the combination of video and rubrics hampers learning by causing extraneous processing, increasing intrinsic load and preventing effective use of germaine load, thereby hampering mental model creation. My research aligns with the focus of IV4VET because vocational education is centered around the accumulation of complex skills that lead to the vocational proficiency of the learner. Educationally effective use of video calls for a wide array of interactive functionality, such as cueing, segmentation, and learner-adaptability through training wheels principles and part-task videos. In our project, 'hypervideo' is used by learners at varying levels. Novices are facilitating by showcasing simple whole tasks and video-embedded procedural information. Experts are facilitating through self- directed video selection, fading the guidance provided by the video and introducing more complex video modeling examples.

One of the main questions that need answering is the mastery level for effective implementation of hypervideo. Various insight on pre-training principles, self-directed goal selection and simple to complex sequencing require a certain level of mastery in the implementation of hypervideo and the choices of imbedded media that comes with it. Personally, I would love to present and discus how our project tackles learner input.

I will present my theoretical paper on the development of the video enhanced rubric, in which I revisit rubrics for the specific use of fostering complex skills by introducing video and formative assessment. Developmental guidelines for practical implementation of video will also be presented. During the presentation of my theoretical paper, I will present a prototype of the digital feedback tool, incorporating video and rubrics into a learner-ready digital solution.
The project is developed in close collaboration with three schools for secondary education in the Netherlands, who provide several teachers for a bi-weekly meeting focusing on practical educational implementation. Students from aforementioned research schools are involved in the development of the student front-end, in the effort to create an engaging interface.

References

1. Van Merriënboer JJG, Kirschner PA (2007) Ten Steps to Complex Learning. Lawrence Erlbaum Associates, Inc., New Jersey
2. Bjerrum AS, Hilberg O, van Gog T, et al (2013) Effects of modelling examples in complex procedural skills training: A randomised study. Med Educ 47:888–898. doi: 10.1111/medu.12199
3. Hoogerheide V, Loyens SMM, van Gog T (2014) Effects of creating video-based modeling

examples on learning and transfer. Learn Instr 33:108–119. doi: 10.1016/j.learninstruc.2014.04.005
4. Westera W (2011) Reframing Contextual Learning: Anticipating the Virtual Extensions of Context. 14:201–212.
5. Rohbanfard H, Proteau L (2013) Live vs. video presentation techniques in the observational learning of motor skills. Trends Neurosci Educ 2:27–32. doi: 10.1016/j.tine.2012.11.001
6. Mayer RE (2009) Multimedia learning (2nd ed.). Cambridge Univ Press. doi: 10.1007/s13398-014-0173-7.2
7. Clark I (2012) Formative Assessment: Assessment Is for Self-regulated Learning. Educ Psychol Rev 24:205–249. doi: 10.1007/s10648-011-9191-6
8. Van Merriënboer JJG, Kester L (2005) The four-component instructional design model: Multimedia principles in environments for complex learning. Cambridge Handb …. doi: 10.1017/CBO9781139547369.007