Quality Criteria to Create a Good Learning Video for Mathematics Lessons – Creators' Perspective

Metadata:

1. Title of the video: ……………………………………………

2. Theme/s of the content (please tick in the correct box/es):

Arithmetic (Numbers and measurement)	
Algebra	
Geometry including Euclidean Geometry, Analytical Geometry, Linear Algebra	
Statistics and/or probability	
Calculus (Analysis)	
Other (please specify) …………………………………………	

3. Topic and/or subtopic: ……………………………………………

4. Intended target group:

Kindergarten	
Primary	
Junior secondary	
Senior secondary	
Vocational	
Tertiary	
Other (Please specify) …………………………………………	

5. Objectives for the learner: ……………………………………………

6. Expected prior knowledge: …………………………………………

7. Nature (type) of the video (Please tick in the correct box/es):

Conceptual explanation	
Procedural explanation	
Exploration	
Problem-solving	
Diagnostic	
Modelling	
Proofs	
Exercise	
Other (please specify) ……………………………………………	

8. Duration

Time in minutes	
≤ 3	
$3 < t \leq 5$	
$5 < t \leq 10$	
≥ 10	

	Criteria		Description
1	Objectives of the video match with the objectives of the curriculum.		
2	The title adequately announces the content of the video.		When choosing a title to the video it must reflect the content of the video. In other words, the title must not mislead the user.
3	The mathematical content is:	accurate.	
		logically structured.	
		not overloaded.	The mathematical content discussed in the video is not too much for a short video and for the target group. Only a few concepts are discussed in the video. For example, if one video presents too many concepts then the learner may not be able to understand any of them. Thus, a video should focus on one or two concepts that are interconnected and relevant for the learner.
		appropriate for the target group.	The mathematical content matches with the curriculum of the target group. That means the content should fill the gap

		between their existing knowledge and expected knowledge.	
4	The mathematical language and terminology are:	correct.	
		appropriate for the target group.	The use of mathematical language and terminology, including all symbols, is an important practice in teaching mathematics. Thus, in a video it is also crucial to use mathematical language and terminology when and where necessary and must be suitable for the learner.
5	The didactical-conceptual and methodological preparation of learning content:	does not lead to misconceptions.	The way of presenting selected mathematical content is equally important for the learner to understand the concepts correctly. In doing so, the presentation plan needs to be structured in such a way that it does not build any misconceptions for the learner.
		is focused on the goal and connected to the previous and next step in a logical structure.	The whole structure of the video needs to be organized in such a way that each step is connected to the previous step and to the next step in a logical manner. This needs to be focused on the learning objectives.

		has a good sequence of instructions, including mobility of the letters, numbers, images, formulae, equations, etc.	Instructions should be in a logical order to build the mathematical argument accurately and without leading to misconceptions. In doing so the mobility (appearance and disappearance on the screen and moving on the screen, if there's any movement) of letters, numbers, functions, equations and diagrams need to be synchronized correctly.
		has multiple appropriate representations.	Using multiple representations, such as numerical, algebraic, graphical and pictorial representations, is an important factor in teaching mathematics. Including appropriate representations in a meaningful way is an important factor that needs to be considered in a learning video.
		is motivating the learner to watch and learn from the video.	The video should not be boring. There are different ways to improve learners' motivation such as: having a short video rather than a very lengthy one; having clear pronunciation; using attractive colours (but not too many); having dynamic figures (animations, step-by-step

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		handwritten videos) than static pictures, etc.	
		Is appropriate with different learning approaches, different learning preferences, and including appropriate example(s) (if any).	If possible, it is good to have more than one method of approaching the content. Learners may have different learning preferences. So, if possible, addressing learners' different learning preferences would be an added advantage of the video. If the video consists of examples, those examples must be appropriate for the target group and need to be universal examples rather than examples understood by a certain community (country or society, etc).
6	The video is technically good in:	picture quality.	
		appropriate speed of changing the pictures on the screen.	
		correct synchronization of voice and pictures.	
		appropriate speed of explanations.	

		clarity of pronunciation.	
		clarity of writing (letters, mathematical formulae, functions, drawing graphs and diagrams).	
		not overloaded with diagrams, pictures, graphs, formulae, equations, etc.	The screen should not be overloaded with many items that would disturb to focus on important facts. Unnecessary information that was already discussed or would be discussed later in the video may disrupt the learner's focus.
		having an aesthetic blend appropriate for the target group.	If there is any musical, dancing, acting or any aesthetic addition included in the video they need to be appropriate and not distracting from the content and the main goal of the video. It must also be suitable for the target group of learners.
7	Other (please specify): …………………………………		

After creating a video, you can use the following criteria with the given Likert scale for a self-reflection of your video.

Watch the video you created and choose the most relevant response among the four responses in the columns in the right-hand side for each criterion.

Key: SA – Strongly agree, A – Agree, D – Disagree and SD – Strongly disagree.

	Criteria		SA	A	D	SD
1	Objectives of the video match with the goals of the curriculum.					
2	The title adequately announces the content of the video.					
3	The mathematical content is	accurate.				
		logically structured.				
		not overloaded.				
		appropriate for the target group.				
4	The mathematical language and terminology are	correct.				
		appropriate for the target group.				
5	The didactical-conceptual and methodological preparation of learning content	is not leading misconceptions				
		is focused on the goal and connected to the previous and next step in a logical structure.				
		has a good sequence of instructions including mobility of the letters, numbers, images, formulae, equations etc.				
		has multiple appropriate representations.				

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		is motivating the learner to watch and learn from the video.				
		is appropriate with different learning approaches, different learning preferences and including appropriate example(s) (if any).				
6	The video is technically good in	picture quality.				
		appropriate speed of changing the pictures on the screen.				
		correct synchronization of voice and pictures.				
		appropriate speed of explanations.				
		clarity of pronunciation.				
		clarity of writing (letters, mathematical formulae, functions, drawing graphs and diagrams).				
		not overloaded with diagrams, pictures, graphs, formulae, equations, etc.				
		having an aesthetic blend appropriate for the target group.				