Quality of learning materials, a minimum model for Wikiwijs

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Abstract
In the Netherlands, Wikiwijs has to be the place where all teachers of the Netherlands, ranging from primary education to higher education, can (co)develop, share, rework and use digital learning materials, published under an open license. Concerning the quality of the learning materials, Wikiwijs does not present a minimum threshold for learning materials from the philosophy that teachers are the best capable of judging the quality of these materials. Therefore, Wikiwijs only offers rating and review possiblities to make quality visible. Since the launch of Wikiwijs, several complaints were made about the quality of the learning materials, ranging from non accessibility caused by dead links, wrong metadata, to bad quality of the content. We therefore decided to define a model to assess a minimal quality of learning resources. This model had to take into account both the philosophy of Wikiwijs (as low a treshold as possible) and the practical application of it (efficient assessment of learning materials should be possible). The model is built up by several requirements, divided into the categories Must have and Nice to have. The model was used by editors during the last months of 2011, leading to some adjustments of the model.

Keywords
Quality of open learning resources, Wikiwijs, community

Introduction
In the Netherlands, Wikiwijs has to be the place where all teachers of the Netherlands, ranging from primary education to higher education, can (co)develop, share, rework and use digital learning materials, published under an open license. Since the launch of the first version of this portal in 2009, several 100,000s learning materials are made available through Wikiwijs. Although Wikiwijs has its own repository, most of the learning materials that can be found through the Wikiwijs search engine resides in collections elsewhere. The metadata of the learning materials in these repositories are harvested and thereby made available to the search engine of Wikiwijs. When a user wants to access these materials, they leave Wikiwijs and enter the repository in which the learning material resides.

Concerning the quality of the learning materials, Wikiwijs does not present a minimum threshold for learning materials from the philosophy that teachers are the best capable of assessing the quality of these materials. An important issue in an open setting like Wikiwijs is the great number of contexts in which the learning materials can be used. This makes it difficult for Wikiwijs, not being part of these contexts, to assess the quality. Instead, Wikiwijs offers rating and review possiblities to users of Wikiwijs to make quality visible.

Since the launch of Wikiwijs, several complaints were made about the quality of the learning materials, ranging from non accessibility caused by dead links, wrong metadata, to bad quality of the content (without specifying what was meant by "quality"). Mid 2011 it was therefore decided to formulate a minimum model for quality to be used by Wikiwijs. This model was used by a

number of editors to evaluate learning materials. In this paper the model is presented and the results of the evaluation are described.

The quality model
The quality model had to meet the following demands
- Applying the model to assess learning materials should be easy and not time consuming
- Contextual requirements will not be part of the model

In this sense, the aim was to define a minimal quality model to have the treshold as low as possible but still describe the aspects of the learning resource that are the source of most of the complaints of the users of Wikiwijs. The model consists of requirements and per requirement an operationalization to be used by the editors to assess whether or not the learning material fulfills the given requirement.

Sources for the requirements were a study to quality requirements for e-learning (Ubachs, 2007), a study to automating OER assessments (Leary et al, 2011), several internal publications from the Open Universiteit and a conversation with the director of Klascement, a platform for sharing learning resources in Belgium. After formulating a first version, the editors (being teachers in primary and secondary education) were asked to comment on it, leading to adjustments to the model.

The requirements are divided into two categories:
- **Must-have**. A learning resource has to comply to all requirements into this category to pass the assessment. Most of the complaints from users of Wikiwijs are about not complying to requirements from this category.
- **Nice to have**. Only those resources that comply to all Must haves are assessed for the requirements in this category. Not complying to one or more of the requirements from this category gives direction to improvement activities for the learning resource. The resource passes the assessments

Table 1 lists the requirements and its operationalizations.

Table 1. Requirements of the quality model

#	Requirement	Operationalization
Category 1: Must have		
1.1	No spelling mistakes	Max 3 spelling mistakes in a sample of 100 words
1.2	Good contrast (in webpages)	Light background with sufficiently dark characters
1.3	Playable on a regular PC or Mac	Not necessary to install extra tools to be able to use the learning resource
1.4	No 404 links	No 404 links in a sample of a maximum of 10 links in the resource. Also when a 404 link is discoverd apart from the sample, the resource does not pass the assessment.
1.5	Correct metadata	The values for Context, Title, Description, Costs and Aggregation

		level should be correct.
1.6	Copyright cleared	The learning resource should not clearly violate copyright laws
1.7	Not outdated	Learning material contains elements that are outdated
Category 2: Nice to have		
2.1	Grammatically correct sentences	A maximum of 5 grammatical mistakes in a sample of 100 words. Spelling mistakes are not taken into account (category 1)
2.2	Correct punctuation	A maximum of 5 punctuation mistakes in a sample of 10 sentences. Only clear mistakes like no period at the end of a sentence or no captial after a period at the start of a new sentence.
2.3	Presence of a table of contents	With large resources, a table of contents is preferable
2.4	Learning goals present	For resources of aggregation level 3 or 4 (course or series of courses) the learning goals should be clear
2.5	Necessary prerequisites present	It is formulated which knowledge and skills is expected to be already mastered by the student when using the resource.
2.6	Original sources are described	When other sources are used in the learning resource, the origin of those sources are described.

Some remarks to these requirements
- The operationalization of requirement 1.3 is not unambiguous. E.g. a learning resource meant for a digital schoolboard can only be viewed on a PC or Mac after installing of a viewer. Some content is especially made for one platform (e.g. a Mac), so editors not using this device could not assess this requirement. Editors using this model have interpreted the operationalization to their own insights.
- After some experimentation with this model, some editors slightly adapted requirement 1.4. A 404 link in a list of sources for background material was not considered severe enough to reject the resource at all.
- Requirement 1.5 assesses the metadata elements where false values have a large impact on the satisfaction of the users.
- Requirement 1.6 only counts for learning resources in the Wikiwijs repository. Having an editors process in place gives the obligation to also check the own repository on copyright infringements (source: a conversation with the director of Klascement).
- Requirement 1.7 is about elements for which being out of date is annoying. Example: using the "florin" currency instead of "euro" in calculus tasks.
- Requirement 2.5 is about the not-so-clear preknowledge. E.g. knowledge about some mathematical subjects when the resource treats a subject of physics in another way than usually is the case.

Experiences in using the model
In the period of September to December 2011, 7 editors used the model to assess learning resources found in Wikiwijs. When the resource failed the assessment (at least 1 Must have was not met), they gave it a rating of 1 star (the lowest rating possible in Wikiwijs) and notified the author of the resource about their findings so s/he was able to improve the resource. When the resource passed the assessment, it was rated with 3 to 5 stars, depending on the assessment on the Nice to have requirements.

Each editor was expert in a specific subject (e.g. History, Mathematics). Each editor assessed resources of their own field of expertise. Resources were chosen at random. When a resource passed the assessment, they also quickly looked into the content and wrote a review in Wikiwijs with their findings. The editors reported average assessment times per resource from 1 - 2 minutes when not writing a review.

Table 2 gives a result about how the resources performed on the requirements of the Must have category.

Table 2. Results of the editor assessments (N=1548)

#	Requirement	Aantal	%
1.1	No spelling mistakes	1193	77%
1.2	Good contrast	1112	72%
1.3	Playable on regular PC or Mac	1128	73%
1.4	No 404 links	1139	74%
1.5	Copyright cleared	1100	71%
1.6	Not outdated	1146	74%
1.7	Correct metadata	1062	69%

827 learning resources (53%) met all requirements.

Future plans
Based on this minimal quality model, we will continue to assess learning resources. We will also monitor if adding the reviews and the ratings by the editors will lead to an increase in rating and reviewing by other users. We have noticed a small increase the last period, but it is too early to draw a conclusion about the effect of more ratings and reviews visible on the willingness of other users of Wikiwijs to add their rating or review.

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