Quality Assessment Plan on the GeoGebra Materials Platform

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GeoGebra Global Gathering 2017
Quantity vs. Quality

• Dynamic material - Dynamic Mathematics Software GeoGebra (Hohenwarter 2006)

• Large number of user-generated OERs (for instance, GeoGebra, 2017; LearningApps, 2017)

• Not supported by an editorial team

https://www.geogebra.org/search

Example of a large repository
Quantity vs. Quality

- **Inconsistent quality** (Camilleri, Ehlers & Pawlowski 2014; Ott & Hielscher 2014)

- **Difficult for teachers to find high-quality materials**

- **Quality assessment on platforms**  
  (for instance, questionnaire, Trgalova et al. 2011, I2Geo 2017)

https://www.geogebra.org/search

Example of a large repository
Research Questions

Q1: What quality criteria for dynamic materials exist according to experts?

Q2: How do experts describe the educationally valuable use of dynamic materials?
Q3: How could the conclusions from research questions 1 and 2 contribute to the conceptual design of a new review system and the further development of platforms, e.g. “GeoGebra Materials”? 
Research Design

• Qualitative and quantitative approach (Cohen, Manion & Morrison 2011)


• Theoretical and detailed quality catalogue (Research Questions 1 & 2)

• New ideas for material sharing platforms (Research Question 3)
"Quality seems to be a complex concept, specifically in the field of learning, education, and training."

(Pawlowski et al., 2007, p. 1)
Findings

Orthocenter of a triangle

Move point C and observe!
Three altitudes pass through a common point called the orthocenter of the triangle.

In what kind of triangles do the three altitudes intersect inside the triangle?
- lie on a vertex?
- intersect outside the triangle?

Original Pöchtrager (translated in English)

(Interview 2014-11-12, teacher B, http://ggbm.at/mXFpXfza)
Aspects for Quality Assessment of Dynamic Material

Experts name different quality criteria for dynamic materials and educationally valuable use.
Aspects for Quality Assessment of Dynamic Material

(Interview 2014-11-12, Teacher B)

<table>
<thead>
<tr>
<th>Quality criterion</th>
<th>Question</th>
<th>How?</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Supporting the learning of mathematics”</td>
<td>“Does the dynamic material support the learning of mathematics?”</td>
<td>Allows students to explore with the dynamic construction</td>
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<tr>
<td></td>
<td></td>
<td>Allows discovering mathematics</td>
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<td></td>
<td></td>
<td>Encourages students to conduct their own assumptions</td>
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<td></td>
<td></td>
<td>Encourages students to formulate insights</td>
</tr>
</tbody>
</table>
**Aspects for Quality Assessment of Dynamic Material**

**AUTHOR**
- Author
- Integration into teaching

**USER**

**MATERIAL**
- Mathematical content
- Resource type
- Supporting the learning of mathematics
- Advantages of dynamic material
- Design and presentation
- Technical aspects

Experts name different quality criteria for dynamic materials and educationally valuable use.
Interview 2015-07-15 (Mathematics educator H)

Mentioned an author, whose “materials are brilliant and if you see something of [...] then it is a guarantee of quality.”

„If you get to know people who produce quality materials, they don’t tend to produce quality materials by accident. Once, you find one or two things by somebody which is good, you can expect pretty much more materials with high quality.”
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User

- Language
- Target group
- Education level, type of school
- Available technology
- View on learning
- …

High-quality author A
- Primary school

High-quality author B
- University

„GeoGebra Materials“

Follower Badge („The Who to Follow Service at Twitter“, Gupta, Goel et al. 2013)

Recommending users and materials
Questions

Thank you for listening!

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References


Material platforms


Figure

Dynamic worksheet, orthocenter of a triangle, Interview 2014-11-12, teacher B, http://ggbm.at/mXFpXfza