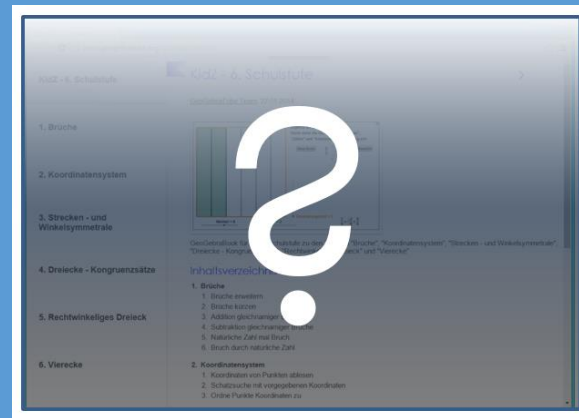


# Quality Assessment Plan on the GeoGebra Materials Platform

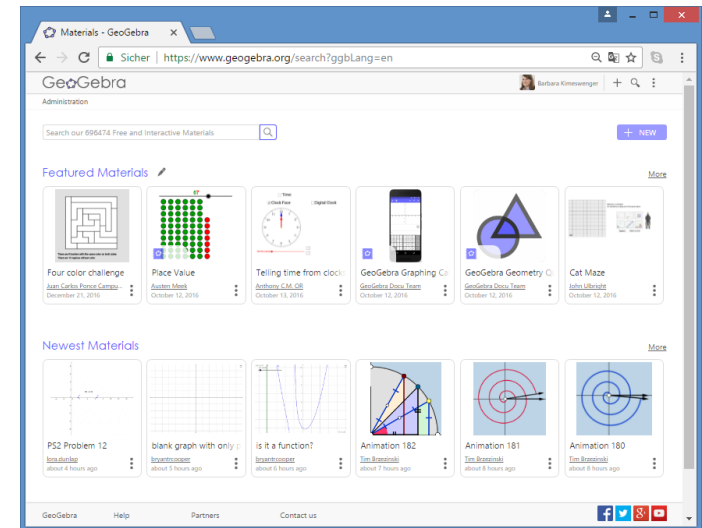


Barbara Kimeswenger

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

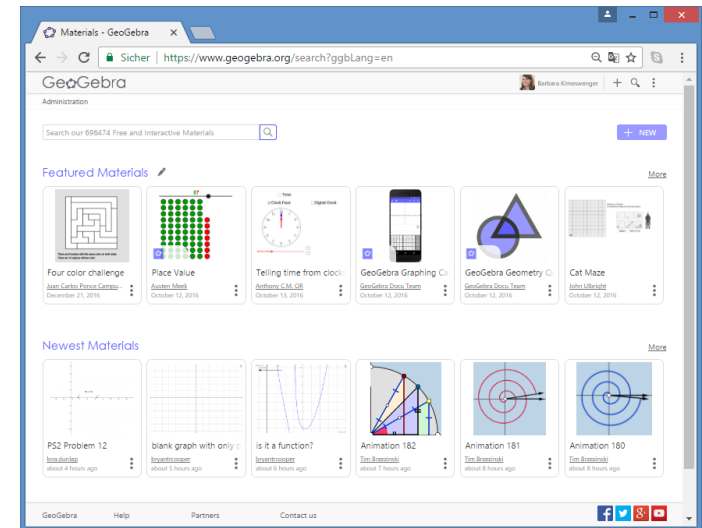


<https://www.geogebra.org/search>

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)



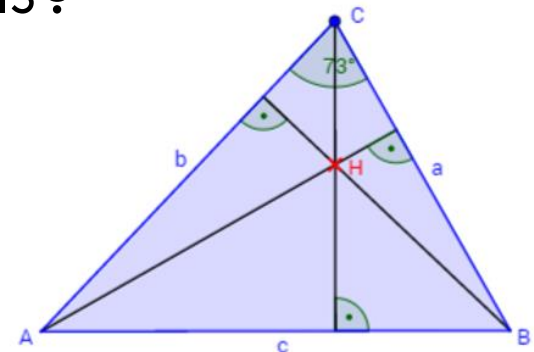
<https://www.geogebra.org/search>

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?

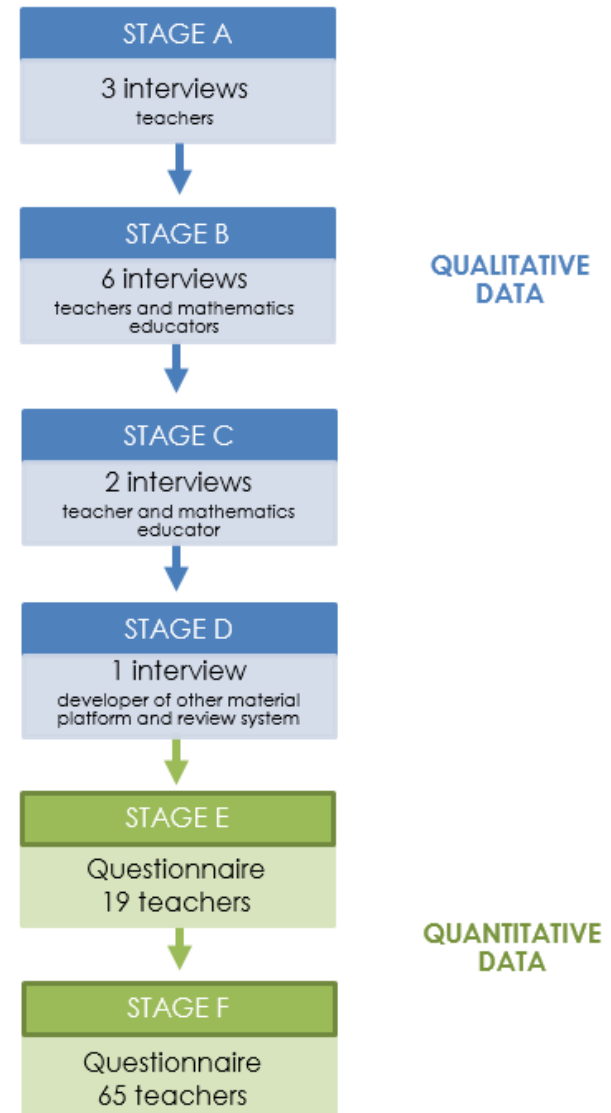


# Research Questions

**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”?



- Qualitative and quantitative approach (Cohen, Manion & Morrison 2011)
- Flexible design, Grounded theory (Creswell 2012, Glaser & Strauss 2009, Strauss & Corbin 1996, Corbin & Strauss 2014, Goulding 2002, Oktay 2012, Charmaz 2006, Krotz 2005, Mey & Mruck 2011)
- Expert interviews (Besser 2014, Cohen, Manion & Morrison 2011, Gläser & Laudel 2009, Helfferich 2011)
- Theoretical and detailed quality catalogue (Research Questions 1 & 2)
- New ideas for material sharing platforms (Research Question 3)



# Quality

*“Quality seems to be a complex concept, specifically in the field of learning, education, and training.”*

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

Orthocenter of a triangle - X

<https://www.geogebra.org/m/mXFpXfza>

GeoGebra

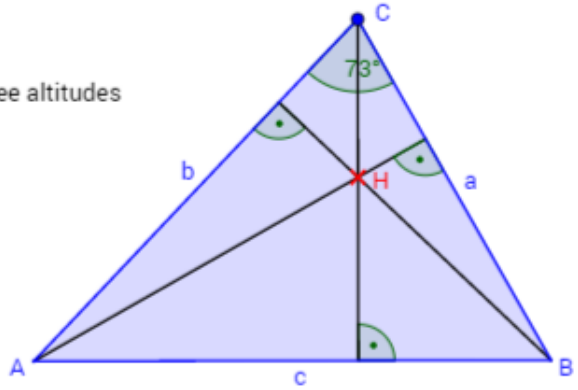
## Orthocenter of a triangle

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?

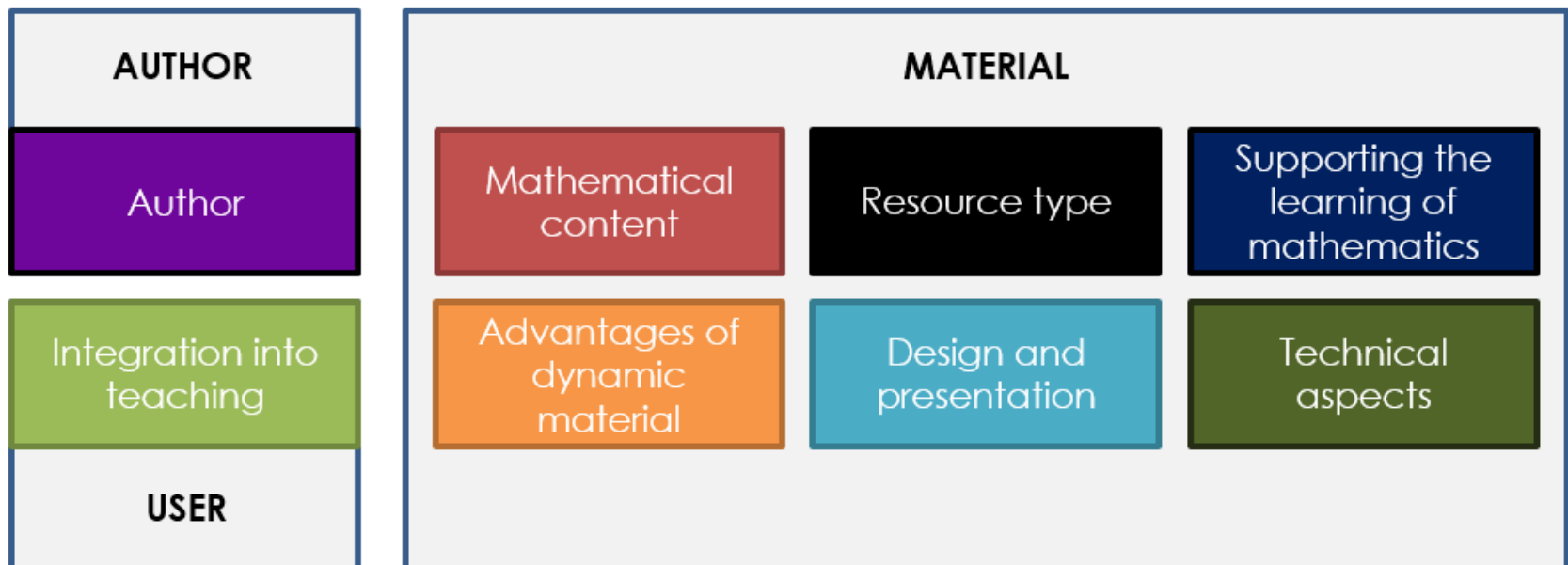


Original Pöchtrager (translated in English)

(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

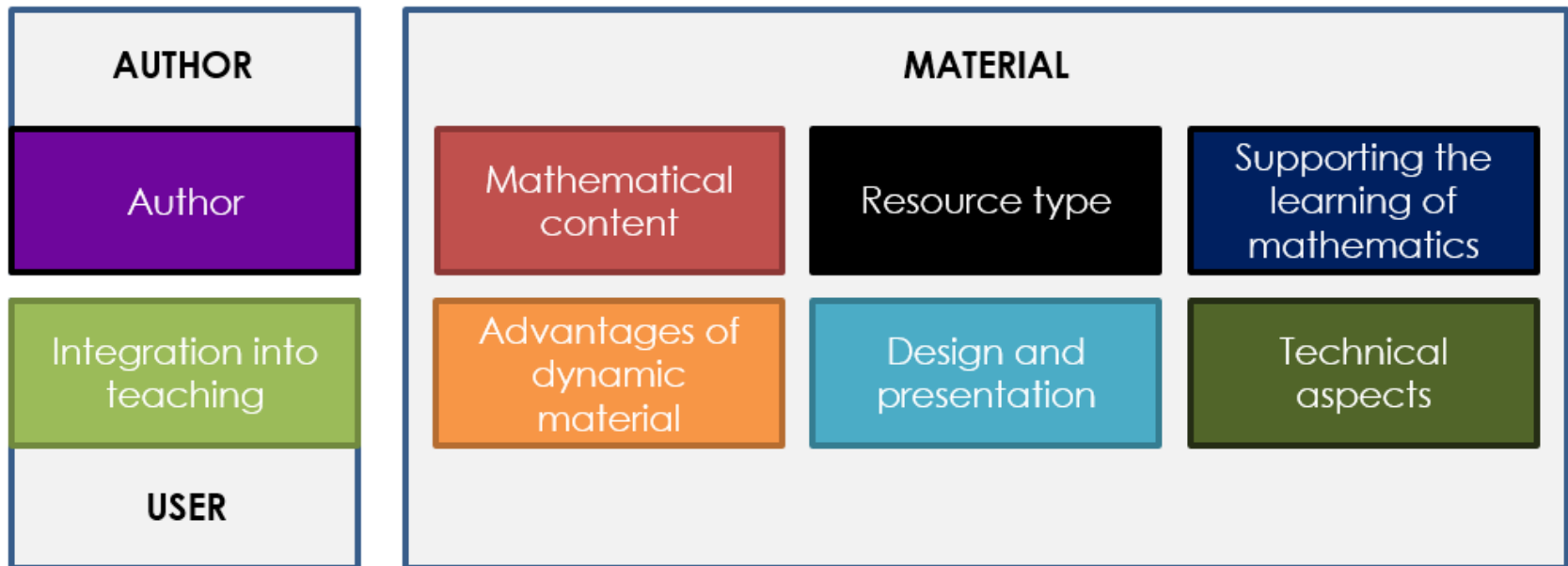
Criterion

Supporting the  
learning of  
mathematics

(Interview 2014-11-12, Teacher B)

Quality criterion	Question	How?
“Supporting the learning of mathematics”	“Does the dynamic material support the learning of mathematics?”	Allows students to explore with the dynamic construction
		Allows discovering mathematics
		Encourages students to conduct their own assumptions
		Encourages students to formulate insights

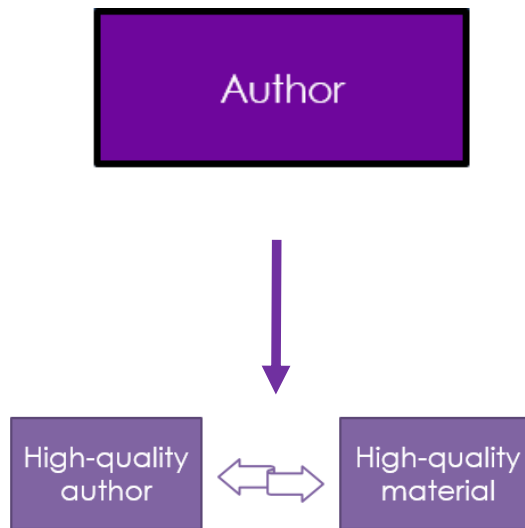
## Aspects for Quality Assessment of Dynamic Material



Experts name different quality criteria for dynamic materials and educationally valuable use

## Interview 2015-07-15 (Mathematics educator H)

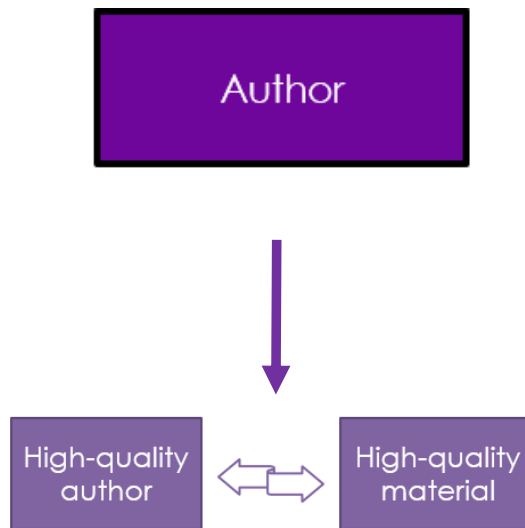
Mentioned an author, whose *“materials are brilliant and if you see something of [...] then it is a guarantee of quality.”*



*„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.”*

## 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.”

# User

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



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

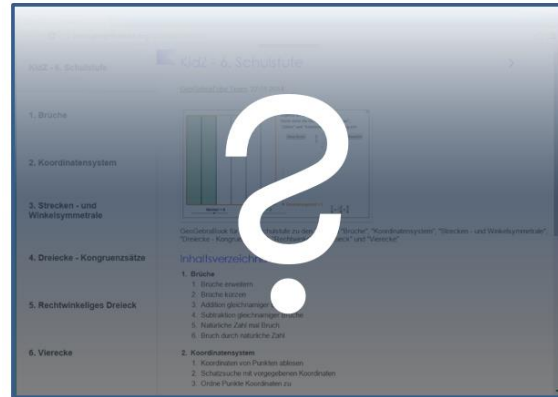
**Recommending users and materials**

High-quality  
author A

Primary school

High-quality  
author B

University



# Questions

# Thank you for listening!

Barbara Kimeswenger  
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[barbara.kimeswenger@geogebra.org](mailto:barbara.kimeswenger@geogebra.org)

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I2Geo (2017). Material platform. <http://i2geo.net>, retrieved on 2017-07-11

LearningApps (2017). Material platform. <https://learningapps.org/>, retrieved on 2017-07-11.

Orthocenter of a triangle - x

<https://www.geogebra.org/m/mXFpXfza>

GeoGebra

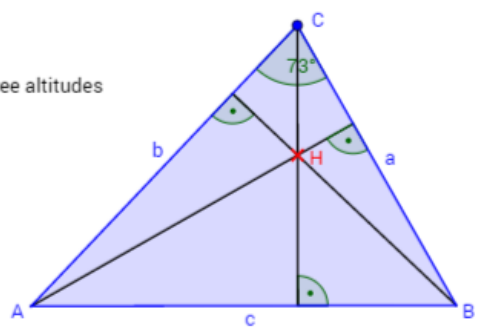
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Original Pöchtrager (translated in English)

Figure

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