# Article information:

Developing a learning progression for scientific modeling: Making scientific modeling accessible and meaningful for learners - Schwarz - 2009 - Journal of Research in Science Teaching - Wiley Online Library
<https://onlinelibrary.wiley.com/doi/10.1002/tea.20311>

# Article summary:

1. The article presents a learning progression for scientific modeling that aims to make the practice accessible and meaningful for learners.

2. The learning progression includes two dimensions: scientific models as tools for predicting and explaining, and models change as understanding improves.

3. Classroom examples from 5th and 6th graders engaged in modeling illustrate how students progress along the learning progression, developing increasingly accurate models with powerful explanatory mechanisms.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article titled "Developing a learning progression for scientific modeling: Making scientific modeling accessible and meaningful for learners" by Schwarz et al. (2009) presents a learning progression for scientific modeling that aims to make the practice more accessible and meaningful for learners. While the article provides valuable insights into the development of scientific modeling skills in students, there are some potential biases and missing points of consideration that should be addressed.

One potential bias in the article is the focus on 5th and 6th graders as the target audience for the learning progression. By focusing on this specific age group, the authors may be overlooking important considerations for learners at different developmental stages. It would be beneficial to explore how the learning progression applies to learners of different ages and educational backgrounds.

Additionally, the article primarily focuses on classroom examples from 5th and 6th graders engaged in modeling. While these examples provide useful illustrations of how students can progress along the learning progression, they may not fully represent all learners' experiences or abilities. Including a broader range of examples from different grade levels and contexts would strengthen the validity of the claims made in the article.

Furthermore, while the article highlights students' progress in constructing and revising increasingly accurate models, it does not thoroughly address potential challenges or limitations of scientific modeling. For example, it does not discuss instances where students may struggle with understanding complex scientific concepts or encounter difficulties in applying their models to real-world phenomena. Including these considerations would provide a more comprehensive analysis of scientific modeling as a learning practice.

The article also lacks exploration of counterarguments or alternative perspectives on scientific modeling. By presenting only one viewpoint on how scientific modeling can be taught effectively, it fails to acknowledge potential criticisms or limitations of this approach. Including a discussion of alternative approaches or addressing potential counterarguments would enhance the overall balance and objectivity of the article.

Moreover, while the authors claim that their learning progression makes scientific modeling accessible and meaningful for learners, there is a lack of evidence or empirical data to support this claim. The article would benefit from including more concrete examples or studies that demonstrate the effectiveness of the proposed learning progression in improving students' understanding and application of scientific modeling.

In terms of promotional content, the article does not appear to have any overt biases or promotional elements. However, it is important to note that the authors are affiliated with Michigan State University, which could potentially introduce some institutional bias.

Overall, while the article provides valuable insights into the development of a learning progression for scientific modeling, there are potential biases and missing points of consideration that should be addressed. By exploring alternative perspectives, providing more diverse examples, and supporting claims with empirical evidence, the article could offer a more comprehensive and balanced analysis of scientific modeling as a learning practice.

# Topics for further research:

* Challenges in teaching scientific modeling to students of different ages and educational backgrounds
* Limitations of scientific modeling in understanding complex scientific concepts
* Difficulties in applying scientific models to real-world phenomena
* Alternative approaches to teaching scientific modeling
* Criticisms of the learning progression for scientific modeling presented in the article
* Empirical evidence supporting the effectiveness of the proposed learning progression for scientific modeling

# Report location:

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