

## Preface

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This year, the workshop on Intelligent Textbooks is organized for the fourth time. It builds on the success of the three previous workshops conducted as parts of the satellite programs of the International Conferences on Artificial Intelligence in Education in 2019<sup>1</sup>, 2020<sup>2</sup> and 2021<sup>3</sup>.

At the first workshop in 2019, most accepted submissions have focused on various aspects of making textbooks adaptive through navigation, recommendation, or problem-solving support. Other popular topics were integration of interactive content, orchestration of learning around digital textbooks and automated analysis of the textbook content for various purposes.

In 2020, adaptivity and interactivity remained important aspects of intelligent textbooks. However, the trend on leveraging machine learning, natural language processing and semantic technologies to automate processing or construction of textbook content became much more prevalent. Several papers and demos have presented approaches for textbook generation, transformation, linking to external content and extraction of knowledge from textbooks.

The third workshop explored a variety of topics. Two new trends that separated it from its predecessors were: demonstration-based papers presenting prototypes of domain-oriented textbook applications and projects exploring automated approaches to extract from textbooks different kinds of learning objects.

This year, the accepted contributions have been broadly categorized into the two main groups. Group 1 focuses on the usage of the textbooks' content to generate various forms of Assessment and Interactive material. Group 2 covers a broad set of topics that explore textbooks enrichment with external content and the use of such enriched textbooks in real educational contexts.

Overall, the workshop has received 13 submissions (7 full papers, 4 short papers, and 2 demo papers). 9 submissions have been accepted (5 full papers, 3 short papers,

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<sup>1</sup> <http://ml4ed.cc/2019-AIED-workshop/>

<sup>2</sup> <https://intextbooks.science.uu.nl/workshop2020/>

<sup>3</sup> <https://intextbooks.science.uu.nl/workshop2021/>

and 1 demo paper); 1 full paper submission has been downgraded to a short paper. The workshop program consists of two sessions that cover its two main themes:

1. Assessment and Interactivity Generation

- Introduction
- Full paper: Reading Comprehension Quiz Generation using Generative Pre-trained Transformers. Ramon Dijkstra, Zülküf Genç, Subhradeep Kayal, and Jaap Kamps.
- Short paper: Automatic Question Generation for Evidence-based Online Courseware Engineering. Machi Shimmei, Noboru Matsuda.
- Demo: Kwame for Science: An AI Teaching Assistant Based on Sentence-BERT for Science Education in West Africa. George Boateng, Samuel John, Andrew Glago, Samuel Boateng, and Victor Kumbol.
- Short paper: YAI4Edu: an Explanatory AI to Generate Interactive e-Books for Education. Francesco Sovrano, Kevin Ashley, Peter Brusilovsky, Fabio Vitali.
- Short paper: Parallel Construction: A Parallel Corpus Approach for Automatic Question Generation in Non-English Languages. Benny G. Johnson, Jeffrey S. Dittel, Rachel Van Campenhout, Rodrigo Bistolfi, Aida Maeda, and Bill Jerome.

2. Enriched Textbooks: from Linking to Learning

- Full paper: Towards a Pedagogical Framework for Designing and Developing iTextbooks. Chaohua Ou, Ashok Goel, David Joyner.
- Full paper: Interactions of reading and assessment activities. Niels Seidel, Dennis Menze.
- Full paper: Augmenting Digital Textbooks with Reusable Smart Learning Content: Solutions and Challenges. Jordan Barria-Pineda, Arun Balajiee Lekshmi Narayanan, Peter Brusilovsky.
- Full paper. Enriching Intelligent Textbooks with Interactivity: When Smart Content Allocation Goes Wrong. Alireza Javadian Sabet, Isaac Alpizar-Chacon, Jordan Barria-Pineda, Peter Brusilovsky, Sergey Sosnovsky.
- Discussion.

The workshop takes place in Durham, UK and online on 27 July, 2022. The workshop website (<https://intextbooks.science.uu.nl/workshop2022/>) provides additional information regarding the announced calls for papers and used submission procedures.

In conclusion, we would like to thank the program committee members of iTextbook'2022 that helped prepare the workshop program:

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