

Julian Kunkel, Sascha Safenreider  
Carolina Ranfla Jimenez

## KI-Methoden im akademischen Alltag: KI-gestützte Literaturrecherche



# Agenda

- 1 Einführung in die KI-gestützte Literaturrecherche
- 2 Übungsphase: Recherche mit KI-Systemen
- 3 Diskussion im Plenum: Chancen und Risiken

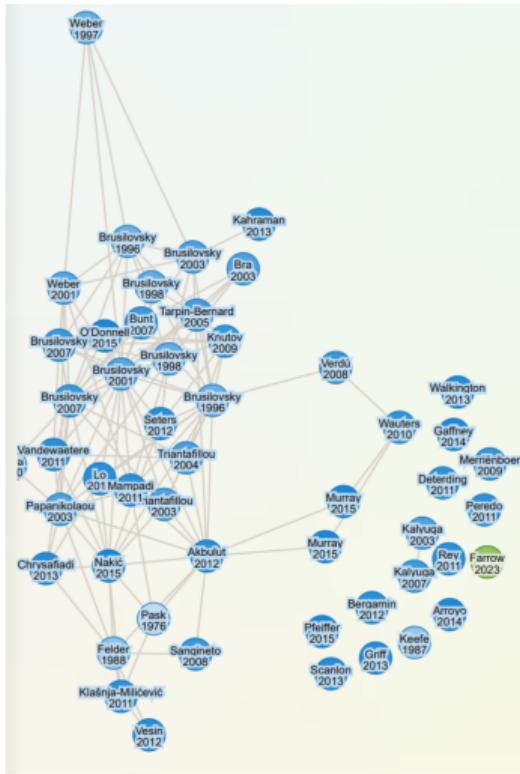
# Lernziele

- Verständnis für KI-basierte Recherchetechnologien
- Anwendung typischer Tools in der KI-gestützen Literaturrecherche
- Kritische Bewertung der KI-Ergebnisse

## Was bedeutet KI-gestützte Literaturrecherche?

- Einsatz von KI, um wissenschaftliche Literatur zu identifizieren, zusammenzufassen, zu clustern und zu snowballen
- Ziel: Zeitersparnis, Effizienz und kontextuelle Relevanz

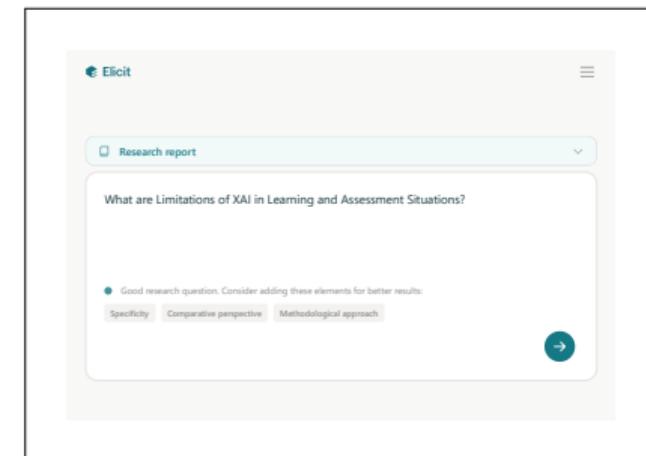
## Was ist Snowballing?



- Methode zur Erweiterung der Literaturrecherche durch Zitierungen.
- Ziel: Aktuell relevante oder lückenhafte Forschungsbereiche entdecken.

Elicit (<https://elicit.com/>)

- Literaturvorschläge auf Fragenbasis
- Kernaussagen und Paper-Extraktion
- Hilfreich für den Einstieg in neue Themen



 **Research report** ▼

What are Limitations of XAI in Learning and Assessment Situations?

- Good research question. Consider adding these elements for better results:

[Specificity](#)[Comparative perspective](#)[Methodological approach](#)

The screenshot shows a user interface for a screening session. At the top, there are navigation tabs: 'Elicit', 'Recent', 'Library', 'Upgrade' (highlighted in green), 'Help', and a user profile 'Sascha'. Below the tabs, the title 'Limitations of XAI in Education' is displayed, along with a 'Paper sources' section and buttons for 'Define screening' and 'Return to report'.

The main content area is titled 'Papers' and contains a table with the following data:

	Sort: Title (alphabetical)	Filter	Search table
<b>Papers</b>			
1	<a href="#">"Why Should I Trust You?": Explaining the Predictions of Any Classifier</a>		
	Marco Tulio Ribeiro, Sameer Singh, Carlos Guestrin		
	<a href="#">North American Chapter of the Association for Computational Linguistics, 2016, 15,362 citations</a>		
	<a href="#">Elicit Search: Abstract Only</a>		
2	<a href="#">A comparison of causal discovery and explainable AI (XAI) for image datasets</a>		
	A. Rawal, Adrienne Raglin, Qianlong Wang, Ziying Tang		
	<a href="#">Defense + Commercial Sensing, 2024, 0 citations</a>		
	<a href="#">Elicit Search: Abstract Only</a>		
3	<a href="#">A Critical Survey on Fairness Benefits of Explainable AI</a>		
	Luca Deck, Jakob Schoeffer, Maria De-Arteaga, Niklas Kühl		
	<a href="#">Conference on Fairness, Accountability and Transparency, 2023, 4 citations</a>		
	<a href="#">Elicit Search: Abstract Only</a>		
4	<a href="#">A Critical Survey on Fairness Benefits of XAI</a>		
	Luca Deck, Jakob Schoeffer, Maria De-Arteaga, Niklas Kühl		

On the right side of the table, there is a sidebar titled 'Papers' with the following content:

- Choose papers for screening**  
Elicit has some initial suggestions, and you can add any relevant PDFs, which will stay in your library.
- Next, we'll develop screening criteria to rigorously assess whether any of these should be part of the review.
- [Hide](#)

Below this, there is a 'Research question' section with the text: 'What are Limitations of XAI in Learning- and Assessment Situations?'. At the bottom of the sidebar, there is a call to action: 'Upgrade to PRO to edit this step'.

Limitations of XAI in Education

Screening criteria View only

Elicit

Recent Library

Upgrade Help Sascha

Sort: Title (alphabetical) Search table

Paper Educational XAI Context XAI Limitations Focus Explainability Component

"Why Should I Trust You?": Explaining the Predictions of Any Classifier

No Maybe Yes

Marco Túlio Ribeiro, Sameer Singh, Carlos Guestrin

North American Chapter of the Association for Computational Linguistics, 2016; 15,362 citations

Elicit Search: Abstract Only

A comparison of causal discovery and explainable AI (XAI) for image datasets

No Yes Yes

A. Rawal, Adrienne Rieglin, Qianlong Wang, Ziyang Tang

Defense + Commercial Seminar, 2024, 0 citations

Elicit Search: Abstract Only

A Critical Survey on Fairness Benefits of Explainable AI

No Yes Yes

Luca Dede, Jakob Schöffler, María De-Arteaga, Niklas Kühl

Conference on Fairness, Accountability and Transparency, 2023, 4 citations

Elicit Search: Abstract Only

A Critical Survey on Fairness Benefits of XAI

No Yes Yes

Luca Dede, Jakob Schöffler, María De-Arteaga, Niklas Kühl

arXiv.org, 2023, 4 citations

Elicit Search: Abstract Only

A Survey on Explainable AI Using Machine

No Yes Yes

Julian Kunkel, Sascha Safenreider, Carolina Ranfla Jimenez

Columns

Add screening columns

Use our suggested screening criteria or add your own. Elicit will evaluate the papers on these criteria, then move on to screening decisions in the next step.

Hide

Columns

Educational Implementation

Educational XAI Context

Explainability Component

Study Type

XAI Application Area

XAI Limitations Focus

Upgrade to PRO to edit this step

Elicit   Recent   Library   ★ Upgrade   Help   Sascha

Limitations of XAI in Education   Screening recommendations   View only   Define extraction   Return to report

Sort: Relevance   Search table

Paper	Screening recommendation
<p>Designing for Student Understanding of Learning Analytics Algorithms Catherine Yeh, Noah Q. Cowit, Iris K. Howley International Conference on Artificial Intelligence in Education, 2023, 0 citations Elicit Search: Abstract Only</p>	<p>Include</p> <p>This study comprehensively addresses explainable empirical investigation of learning analytics, focusing on limitations. By employing Cognitive Task Analysis a systematic approach explores the challenges of making educational decisions in learning analytics applications.</p> <p>Educational XAI Context   XAI Limitations Study Type   Educational Implementation</p> <p>Show criteria evaluations</p> <p>Include</p> <p>This study comprehensively explores explainable A systematic review of XAI tools, their capabilities, and limitations. The research addresses critical aspects of AI transparency and guidelines for incorporating XAI in educational settings, mitigating the risks of AI decision-making. While uncertainty regarding specific application areas is mentioned.</p>
<p>Explainable artificial intelligence for education and training K. Fiok, F. Farahani, W. Karwowski, T. Ahram The Journal of Defence Modeling and Simulation: Applications, Methodology, Technology, 2021, 49 citations Elicit Search: Abstract Only</p>	<p>Include</p> <p>This study comprehensively explores explainable A systematic review of XAI tools, their capabilities, and limitations. The research addresses critical aspects of AI transparency and guidelines for incorporating XAI in educational settings, mitigating the risks of AI decision-making. While uncertainty regarding specific application areas is mentioned.</p>

Screening results

Review screening recommendations  
Evaluate screening decisions for selected papers. Check detailed reasoning and override recommendations as needed.

Hide

Overview

✓ 50 papers evaluated  
● 5 papers included  
● 45 papers excluded

Score threshold ①  
2.7

Papers with screening scores above this value will be included and below this value will be excluded.

Upgrade to PRO to edit this step

**Elicit** Recent Library Limitations of XAI in Education Extraction definition View only

Sort: Title (alphabetical) Search table

Paper	Study Design Type	Experimental Conditions and In...	Participant Characteristics
<b>Be careful what you explain: Benefits and costs of explainable AI in a simulated medical task</b> Tobias Rieger, D. Manzey, Benigna Meussling, L. Ornitsach, Eileen Roseler	Experimental (e.g., controlled experiment, randomized controlled trial) *	<ul style="list-style-type: none"> <li>- Specific XAI manipulation: Participants were informed about the error-prone color of bacteria (50% reliability). *</li> <li>- Control/comparison conditions: NonXAI condition where participants were not informed about the error-prone color.</li> <li>- Detailed description of how XAI was implemented or explained: * Participants in the XAI condition were told about the AI's limitation regarding the error-prone color, while those in the nonXAI condition were not.</li> </ul>	<ul style="list-style-type: none"> <li>- Total sample size: 128</li> <li>- Demographic information: n</li> <li>- Participant domain or context</li> <li>- Recruitment method: not reg</li> </ul>
<b>Designing for Student Understanding of Learning Analytics Algorithms</b> Catherine Yeh, Noah Q. Corbett, Iris K. Howley	Experimental (controlled experiment) *	<ul style="list-style-type: none"> <li>- Specific XAI manipulation: Varying the transparency of limitations of BKT. *</li> <li>- Control/comparison conditions: Providing some information on the algorithm's limitations vs. providing no information. *</li> <li>- Detailed description of how XAI was implemented or explained: Not mentioned in the abstract. *</li> </ul>	<ul style="list-style-type: none"> <li>- Total sample size: not report</li> <li>- Demographic information: n</li> <li>- Participant domain or context</li> <li>- Recruitment method: not reg</li> </ul>
<b>Explainable artificial intelligence for education and training</b> K. Firok, F. Farahani, W. Karnowski, T. Ahram	Theoretical/Review *	Not mentioned * (the abstract does not describe any experimental conditions or interventions. *)	Not mentioned (the abstract does not information on participant characteristics)

Upgrade to PRO to edit this step

Elicit   Recent   Library   Upgrade   Help   Sascha

Limitations of XAI in Education   Extraction results   View only

Sort: Title (alphabetical)   Search table

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<b>Explainable artificial intelligence for education and training</b> K. Firok, F. Farahani, W. Karnowski, T. Ahram The Journal of Defence Modeling and Simulation: Applications, Methodology, Technology, 2021, 49 citations Elicit Search: Abstract Only	Theoretical/Review *	Not mentioned * (the abstract does not describe any experimental conditions or interventions. *)	Not mentioned (the abstract does not contain any information on participant characteristics)

Extraction details

Review and export extraction  
Elicit will extract data from screened-in papers and continue processing them even if you close this tab. When finished, you can export the extraction results as a CSV.

Status

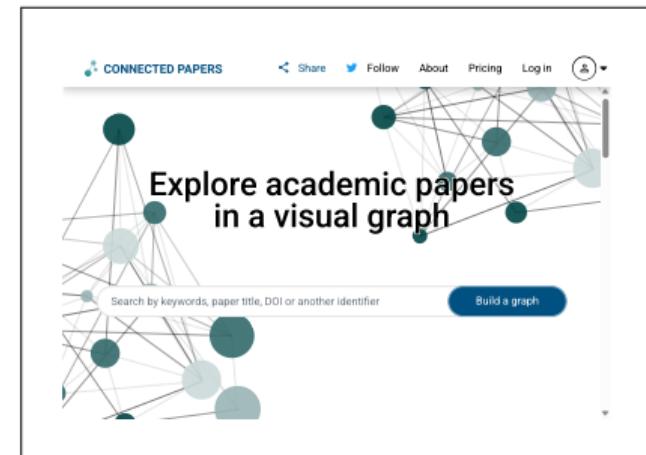
Extraction complete

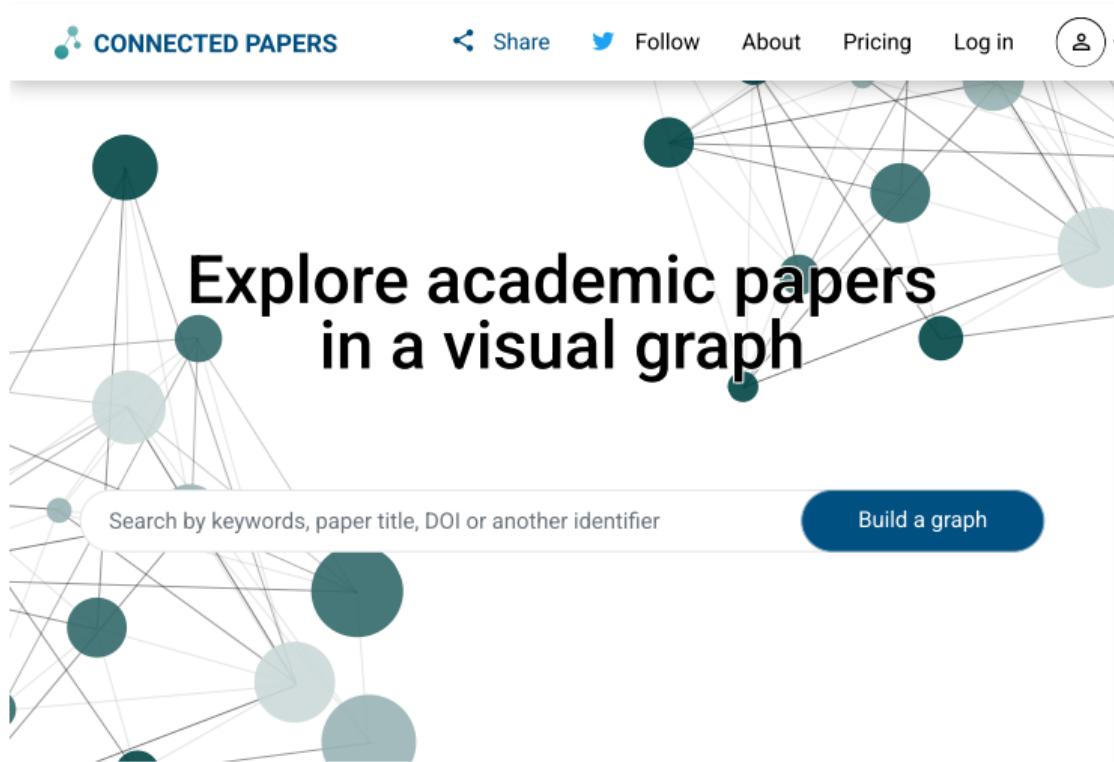
Upgrade to PRO to edit this step

The screenshot shows a web-based application interface for 'Elicit'. At the top, there are navigation tabs: 'Elicit' (with a gear icon), 'Recent' (with a clock icon), and 'Library' (with a folder icon). On the right, there are buttons for 'Upgrade' (with a star icon), 'Help' (with a question mark icon), and a user profile for 'Sascha' (with a person icon). The main content area displays a 'Research report' titled 'Limitations of XAI in Education' (View only). The report was created on APRIL 21, 2025. The title is 'What are Limitations of XAI in Learning- and Assessment Situations?'. The text states: 'XAI faces limitations in transparency, implementation, user comprehension, trust calibration, and ethical considerations when applied to learning and assessment contexts.' Below this is an 'ABSTRACT' section. The abstract discusses five studies in educational and medical settings that describe limitations of explainable AI. It mentions Farrow (2023), Fiolk et al. (2021), Rieger et al. (2023), Spitzer et al. (2024), and Yeh et al. (2023). The abstract notes that while visual explanations can improve learning performance, they may exclude borderline cases and are subject to hardware limitations. It also states that partial disclosure of a Bayesian Knowledge Tracing algorithm's limitations does not necessarily enhance comprehension or assessment accuracy. The abstract concludes by identifying five key limitation types: 1. Algorithm transparency, 2. Implementation challenges, 3. User comprehension barriers, 4. Trust calibration issues, and 5. Ethical concerns. The text ends with a note that XAI in learning and assessment is hindered by technical, interpretative, and ethical challenges. On the right side of the report, there is a 'Report' sidebar with sections for 'Status' (Gather papers, Screen papers, Extract data, Generate report), 'Chat' (Ask anything about the report or its underlying data), and a 'Save PDF' button.

# Connected Papers (<https://www.connectedpapers.com/>)

- Snowballing
- Graphische Paper-Vernetzung
- Visualisierung von Literaturkontext
- Nützlich bei State-of-the-Art-Recherchen  
(und Forschungslücken zu erkennen)







Showing paper suggestions for "XAI in Education".

Choose a paper to build a graph:

Search powered by Semantic Scholar

### The possibilities and limits of XAI in education: a socio-technical perspective

R. Farrow

Journal of Educational Media 2023.

21 Citations, 93 References



Save

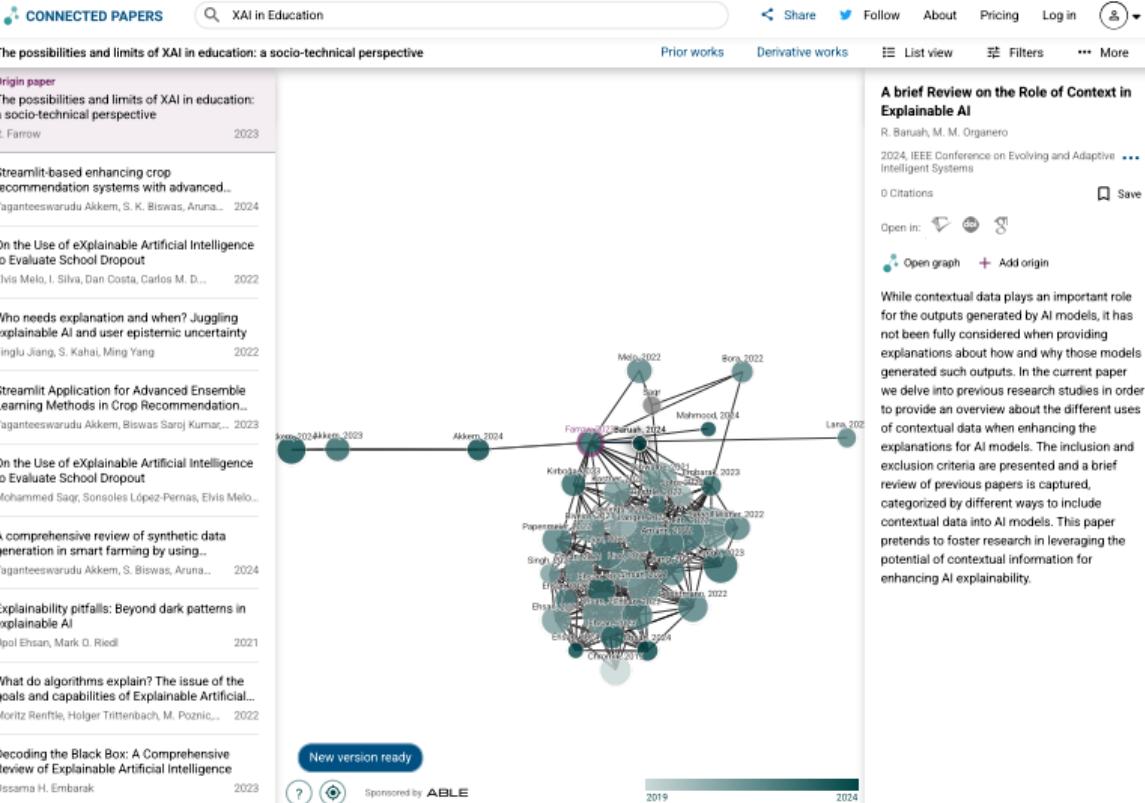
**ABSTRACT** Explicable AI in education (XAIED) has been proposed as a way to improve trust and ethical practice in algorithmic education. Based on a critical review of the literature, this paper argues that XAI should be understood as part of a wider socio-technical turn in AI. The socio-technical perspective is crucial for the development of XAIED. The paper concludes with a call for further research and practical applications of XAIED in education.

Show more

### A 2-Step Methodology for XAI in Education

Francesco Balzan, Andrea Zanellati, Stefano Pio Zingaro, Maurizio Gabbielli

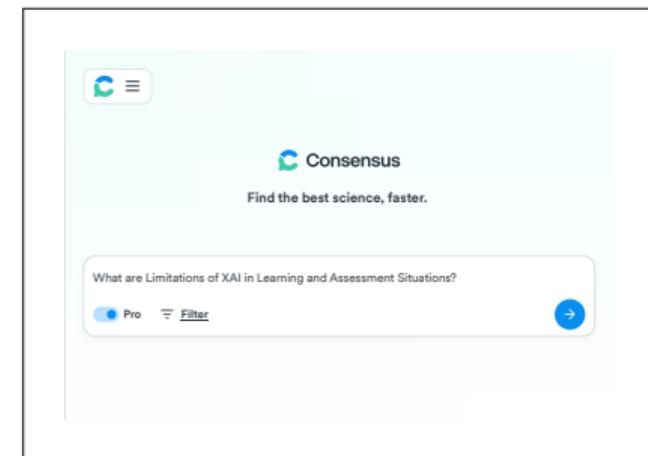
PKDD/ECML Workshops 2023.



The figure is a network graph titled "Explainability Pitfalls: Beyond Dark Patterns in Explainable AI". It visualizes the citation relationships between various research papers. The nodes are represented by circles of varying sizes, indicating the number of citations. A legend at the bottom shows a gradient from small to large circles. The graph is centered around a dense cluster of nodes, with many lines connecting them, representing citations. Nodes are labeled with authors' names and publication years. A legend at the bottom indicates that the size of the nodes represents the number of citations. A "New version ready" button is also visible.

# Consensus (<https://consensus.app/>)

- KI-gestützte Antwort auf Forschungsfragen
- Extrahiert Aussagen direkt aus Studien
- Ideal für schnelle, evidenzbasierte Übersicht
- Fokus auf wissenschaftlich belegte Aussagen



**Consensus**

Find the best science, faster.

What are Limitations of XAI in Learning and Assessment Situations?



Pro



Filter



**XAI in Education**

Explainable Artificial Intelligence (XAI) is increasingly being integrated into educational settings to enhance transparency and trust in AI systems. By making AI models more understandable, XAI aims to improve educational outcomes and facilitate the adoption of AI tools by educators and students.

**Benefits of XAI in Education**

XAI systems are valuable in educational research as they support outcomes like student success, trust, and motivation. They enhance transparency and reliability, particularly in online education systems, by using methods such as SHapley Additive exPlanations (SHAP) and Local Interpretable Model-agnostic Explanations (LIME) to explain model decisions [1](#) [6](#). This transparency is believed to increase trust in AI-based tools, facilitating their adoption by teachers and students [1](#) [2](#).

**Challenges and Solutions**

The integration of XAI in education faces challenges related to the complexity of AI algorithms and the need for transparency and interpretability. Solutions include human-AI collaboration, explainability techniques, and ethical and legal frameworks [3](#). Additionally, there is a need to develop new competencies and skills among students and educators to interact effectively with AI [3](#).

**XAI Frameworks and Tools**

Several frameworks and tools have been developed to incorporate XAI in educational settings. The XAI-ED framework considers key aspects such as stakeholders, benefits, and human-centered designs of AI interfaces [2](#). Additionally, educational tools have been developed to demystify AI processes, such as social media tracking and profiling, enhancing digital literacy and privacy awareness among students [9](#).

**Future Directions**

Future research in XAI for education should focus on expanding datasets to incorporate diverse educational settings and developing real-time educational tools based on interpretability insights [6](#). There is also a need to address research gaps by adjusting XAI methods to provide favorable explanations for students and educators [5](#). Moreover, understanding the impact of user demographics, such as gender and educational background, on the effectiveness of XAI explanations is crucial for tailoring these systems to diverse audiences [10](#).

Follow Up

- Consensus Meter - Does explainable AI improve educational outcomes?
- Explainable AI techniques for personalized learning
- Challenges in implementing XAI in educational systems

Results

1 The Review of Studies on Explainable Artificial Intelligence in Educational Research

Explainable AI systems in educational research enhance transparency and reliability, increasing trust in AI-based tools and facilitating their adoption by teachers and students.

Literature Review

2024 · 1 citation · Gamze Türkmen · Journal of Educational Computing Research

2 Explainable Artificial Intelligence in education

XAI-ED framework helps design and develop educational AI tools by considering stakeholders, benefits, explanation approaches, AI models, human-centered interfaces, and potential pitfalls.

Highly Cited

2022 · 252 citations · Hassan Khosravi et al. · Comput. Educ. Artif. Intell.

3 Explainable Artificial Intelligence in Education: A Comprehensive Review

Explainable AI in education can increase trust and efficacy by providing transparency and interpretability, but requires human-AI collaboration, explainability techniques, ethical and legal frameworks, and new competencies for effective interaction.

Literature Review

2023 · 7 citations · Blerita Abazi Chaushi et al.

 Cite  Save  Share

## The Review of Studies on Explainable Artificial Intelligence in Educational Research

Published Dec 26, 2024 · Gamze Türkmen

Journal of Educational Computing Research  
Q1 SJR score 

1 0  
Citations Influential Citations

 Full text  Upload paper  Semantic Scholar 

[Overview](#) [References](#) [Citations](#)

### Abstract

Explainable Artificial Intelligence (XAI) refers to systems that make AI models more transparent, helping users understand how outputs are generated. XAI algorithms are considered valuable in educational research, supporting outcomes like student success, trust, and motivation. Their potential to enhance transparency and reliability in online education systems is particularly emphasized. This study systematically analyzed educational research using XAI systems from 2019 to 2024, following the PICOS framework, and reviewed 36 studies. Methods like SHapley Additive exPlanations (SHAP) and Local Interpretable Model-agnostic Explanations (LIME), used in these studies, explain model decisions, enabling users to better understand AI models. This transparency is believed to increase trust in AI-based tools, facilitating their adoption by teachers and students.



### Study Snapshot

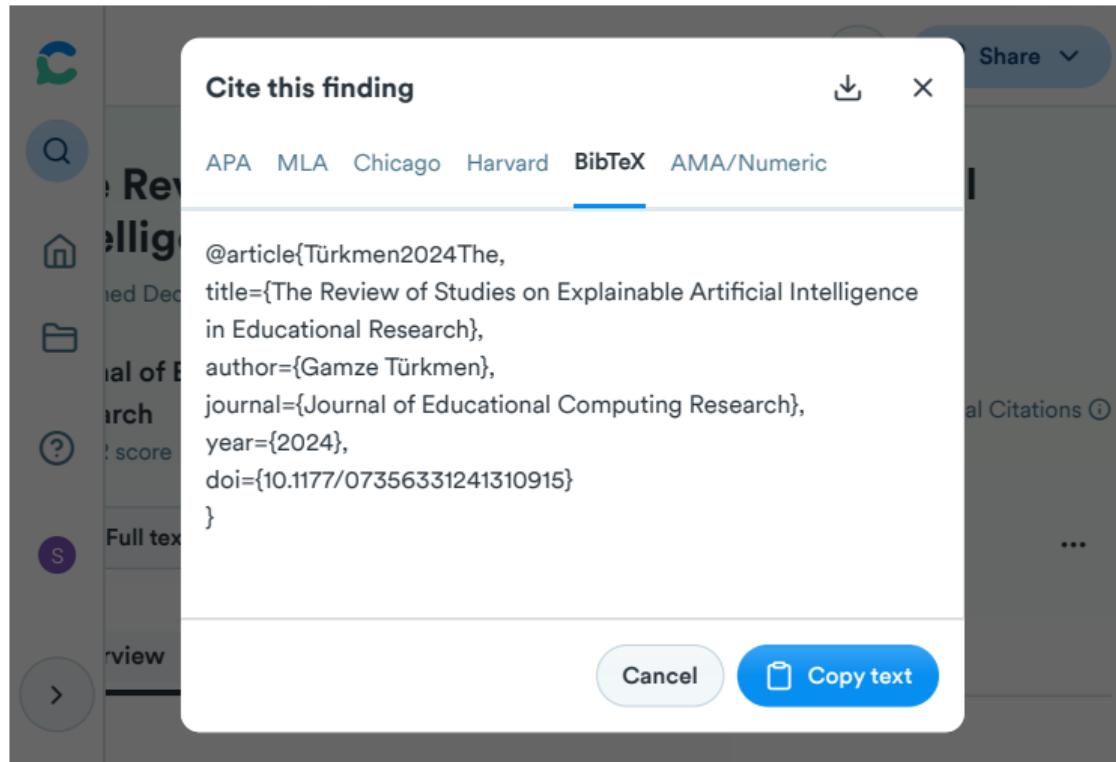
 

Explainable AI systems in educational research enhance transparency and reliability, increasing trust in AI-based tools and facilitating their adoption by teachers and students.

AI Population	Other details to follow
Sample size	10

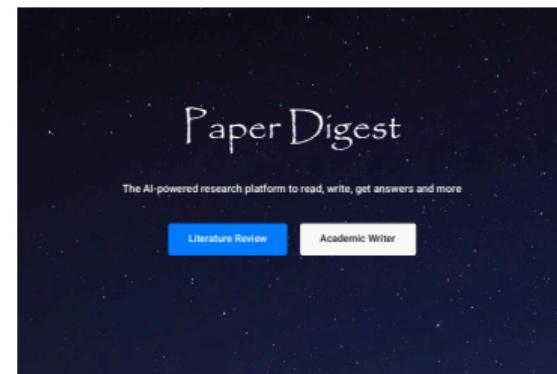
Ask this paper... 

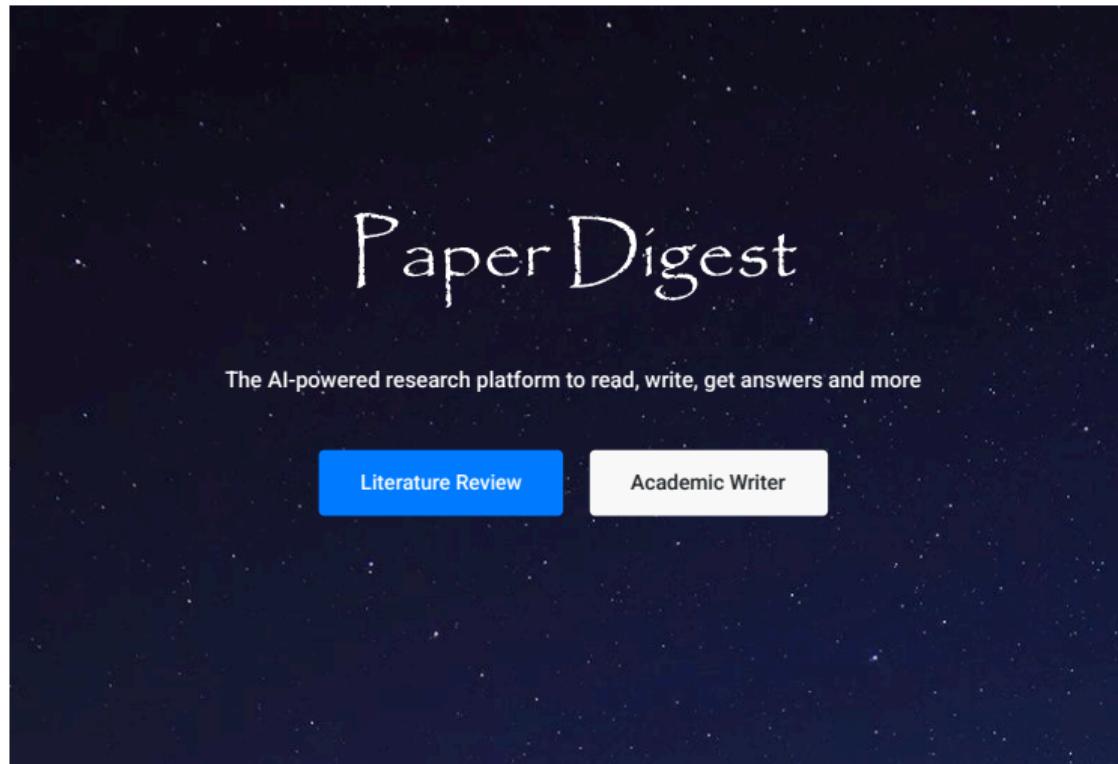
10 Study Snapshots left



# Paperdigest (<https://www.paperdigest.org/>)

- Paper-Zusammenfassungen
- Frage-Antwort-System zu Artikeln
- Gut zum schnellen Verstehen von Studien





**Literature Review**

Review the most influential work around any topic by area, genre & time

All Areas  XAI in Learning and Assessment Situations

Papers  Books  Any Time  Auto  Extensive

Try style transfer - covid vaccine - more (<https://www.paperdigest.org/filter/style/more>) | <https://www.paperdigest.org/search/genre> | <https://www.paperdigest.org/search/author> | <https://www.paperdigest.org/search/type/venue>

**Related Sources**

Literature search does not return great matches, web search results are included as well.

[1] An integrative approach to generating explainable safety – (<https://www.semanticscience.org/article/10.1385/10247178.10201242>)

[2] The Situation Awareness Framework for Explainable AI (SAFE-AI) – (<https://www.semanticscience.org/article/10.1385/10247178.10201149>)

[3] Explainable AI: What it is, how it can help, and what it is not – (<https://www.semanticscience.org/article/10.1385/10247178.10201148>)

[4] Explainable AI: A Machine Learning Scheme Using Vital Signs to – (<https://www.semanticscience.org/article/10.1385/10247178.10201147>)

[5] The role of Explainable Artificial Intelligence in High-Stakes decision – (<https://www.semanticscience.org/article/10.1385/10247178.10201146>)

[6] Cloud-based XAI Services for Assessing Open Repository Models – (<https://www.semanticscience.org/article/10.1385/10247178.10201145>)

[7] How informative is your XAI? Assessing the quality of XAI – Frontiers in psychology – (<https://www.semanticscience.org/article/10.1385/10247178.10201144>)

[8] Explainable AI: Model Simple Techniques, Tools & How To Tutorials – (<https://www.semanticscience.org/article/10.1385/10247178.10201143>)

[9] XAI: AI that can explain the anything. – (<https://www.semanticscience.org/article/10.1385/10247178.10201142>)

[10] XAI: Perceived Trust and Satisfaction with Multiple – (<https://www.semanticscience.org/article/10.1385/10247178.10201141>)

**Review of the Related Sources**

The integration of Explainable Artificial Intelligence (XAI) in learning and assessment contexts has garnered significant attention in recent literature. This review synthesizes findings from various sources to provide an overview of the state-of-the-art technologies ([https://en.wikipedia.org/wiki/Explainable\\_AI](https://en.wikipedia.org/wiki/Explainable_AI)), and applications of XAI in these domains.

One of the foundational frameworks for understanding XAI in learning and assessment is the Situation Awareness Framework for Explainable AI (SAFE-AI), which emphasizes the importance of explanation quality in enhancing situation awareness (2). This framework is particularly relevant in high-stakes decision-making contexts where XAI can help users quickly and accurately impact outcomes (5). The need for effective assessment methods and tools is underscored by the growing complexity of machine learning models, which necessitate robust evaluation mechanisms to ensure their explainability (4, 7).

In practical applications, XAI has been utilized to improve safety assessments in various contexts, such as healthcare and transportation. In these logical safety assessment scenarios are generated through data preprocessing techniques (1). Similarly, XAI has been applied in health-related assessments, providing accurate predictions and interpretable insights based on vital signs (<https://www.semanticscience.org/article/10.1385/10247178.10201146>), thereby enhancing the decision-making process in medical settings (4, 6).

Moreover, the role of XAI in educational settings is becoming increasingly prominent. Studies have shown that XAI can enhance learning analytics ([https://en.wikipedia.org/w/index.php?title=Learning\\_analytics&oldid=871132](https://en.wikipedia.org/w/index.php?title=Learning_analytics&oldid=871132)) by providing insights into student performance and engagement (<https://www.semanticscience.org/article/10.1385/10247178.10201145>), which in turn fosters more positive learning experiences (10). The assessment of perceived trust and satisfaction with different explanation techniques in XAI-enhanced learning analytics has also been explored, indicating that the quality of explanations can significantly influence user satisfaction and trust in these technologies (10).

In summary, the literature highlights the multifaceted role of XAI in learning and assessment situations, emphasizing the need for frameworks that prioritize explanation quality and situational awareness. The ongoing development of assessment methods and tools tailored to XAI applications is crucial for ensuring that these technologies are effectively integrated into various domains, from education to healthcare and beyond.

**Follow**  **Search** ([https://www.paperdigest.org/research/?q=XAI\\_in\\_Learning\\_and\\_Assessment\\_Situations](https://www.paperdigest.org/research/?q=XAI_in_Learning_and_Assessment_Situations))  **Print** ([https://www.paperdigest.org/print/?q=XAI\\_in\\_Learning\\_and\\_Assessment\\_Situations](https://www.paperdigest.org/print/?q=XAI_in_Learning_and_Assessment_Situations))  **Share** ([https://www.paperdigest.org/share/?q=XAI\\_in\\_Learning\\_and\\_Assessment\\_Situations](https://www.paperdigest.org/share/?q=XAI_in_Learning_and_Assessment_Situations))

**Rate & Cite**

Very bad  Good  Average  Bad  Very bad

**Research Copilot**

**User:** XAI in Learning and Assessment Situations

**Expert:** The integration of Explainable Artificial Intelligence (XAI) in learning and assessment contexts has garnered significant attention in recent literature, particularly in high-stakes decision-making environments. The Situation Awareness Framework for Explainable AI (SAE-AI) provides a foundational approach to evaluating the quality of explanations generated by XAI systems, emphasizing the importance of situation awareness in assessing the effectiveness of these explanations (1). This framework is particularly relevant in educational settings where understanding the rationale behind AI-driven decisions can enhance learning outcomes.

In the realm of deep learning, the TCAV (Testing with Concept Activation Vectors) algorithm exemplifies how XAI can be utilized to interpret model behavior by assessing user-defined concepts against random examples (2). This method not only aids in understanding model predictions but also has implications for educational assessments, where clarity in AI reasoning can support learners in grasping complex concepts.

The role of XAI extends to disaster risk management, where it is employed to enhance decision-making processes. For instance, a situation awareness machine learning approach has been applied to assess flood disaster risks, highlighting the necessity of explainability in critical scenarios (3). This application underscores the potential of XAI to inform learners and decision-makers about the underlying factors influencing risk assessments, thereby fostering a more informed approach to learning and evaluation.

Moreover, the use of XAI in disaster risk management cycles illustrates its versatility across various assessment types, including spatial landslide susceptibility assessments (4). This adaptability suggests that XAI can be effectively integrated into diverse learning environments, providing insights that are crucial for both learners and educators.

In educational analytics, the assessment of perceived trust and satisfaction with multiple explanation techniques has been explored, indicating that learners' experiences with XAI can significantly influence their engagement and understanding (5). This highlights the necessity for XAI systems to not only provide accurate predictions but also to ensure that explanations are comprehensible and trustworthy.

The ongoing discourse around the reliability of machine learning models, particularly in the context of XAI, points to the challenges of ensuring that these systems perform consistently across different learning and assessment situations (6). As the field evolves, it is essential to address these reliability concerns to enhance the credibility of XAI applications in educational contexts.

In summary, the literature indicates a growing recognition of the importance of XAI in learning and assessment situations. By enhancing situation awareness, providing interpretable insights, and fostering trust among users, XAI has the potential to significantly improve educational outcomes and decision-making processes across various domains.

[1] The Situation Awareness Framework for Explainable AI (SAE-AI) ...  
<https://www.sciencedirect.com/scientific/10.1080/0647318.2022.2081382>

[2] Explainable artificial intelligence (XAI) in deep learning-based ...  
<https://www.sciencedirect.com/scientific/10.1016/j.jcogres.2020.100177>

[3] The role of explainable Artificial Intelligence in high-stakes decision ...  
<https://link.springer.com/article/10.1007/s12653-023-04594-w>

[4] Explainable artificial intelligence in disaster risk management ...  
<https://www.sciencedirect.com/science/article/pii/S221242922300639>

[5] Explainable AI Made Simple: Techniques, Tools & How To Tutorials (<https://ipointelligence.com/2024/01/15/explainable-ai/>)

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XAI In Learning And Assessment Situations

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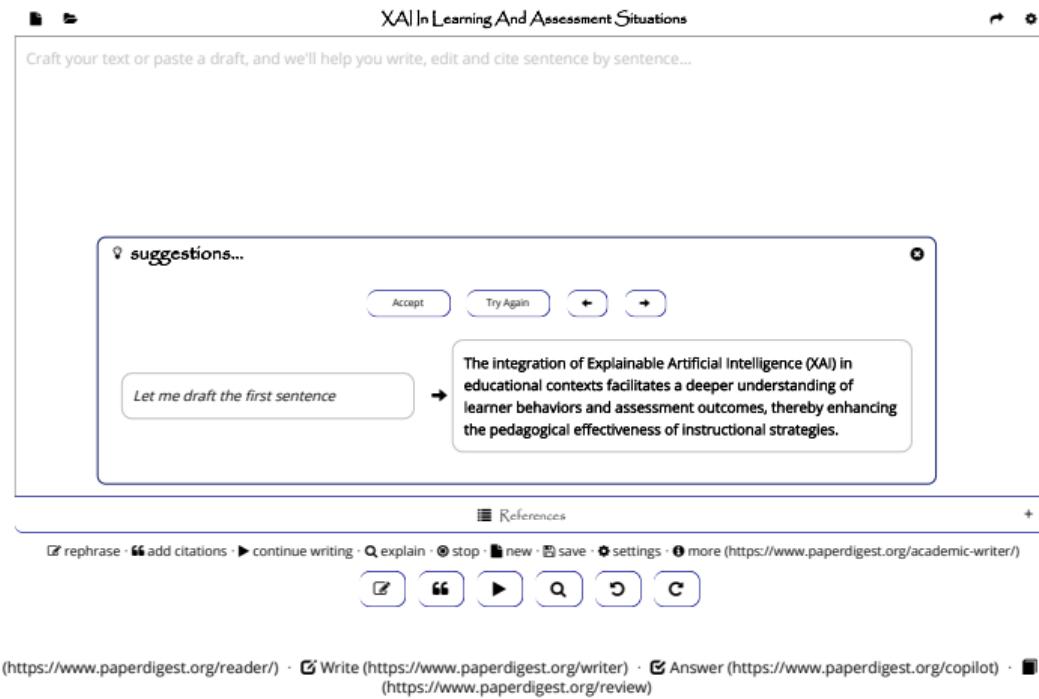
Let me draft the first sentence → The integration of Explainable Artificial Intelligence (XAI) in educational contexts facilitates a deeper understanding of learner behaviors and assessment outcomes, thereby enhancing the pedagogical effectiveness of instructional strategies.

References +

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XAI In Learning And Assessment Situations

The integration of Explainable Artificial Intelligence (XAI) in educational contexts facilitates a deeper understanding of learner behaviors and assessment outcomes, thereby enhancing the pedagogical effectiveness of instructional strategies.

suggestions...

Accept Try Again → →

The integration of Explainable Artificial Intelligence (XAI) in educational contexts facilitates a deeper understanding of learner behaviors and assessment outcomes, thereby enhancing the pedagogical effectiveness of instructional strategies.

→ The integration of Explainable Artificial Intelligence (XAI) in educational contexts facilitates a deeper understanding of learner behaviors and assessment outcomes, thereby enhancing the pedagogical effectiveness of instructional strategies. Moreover, the implementation of XAI frameworks promotes transparency in algorithmic decision-making processes, enabling educators to tailor interventions that are responsive to individual learning needs and preferences.

References +

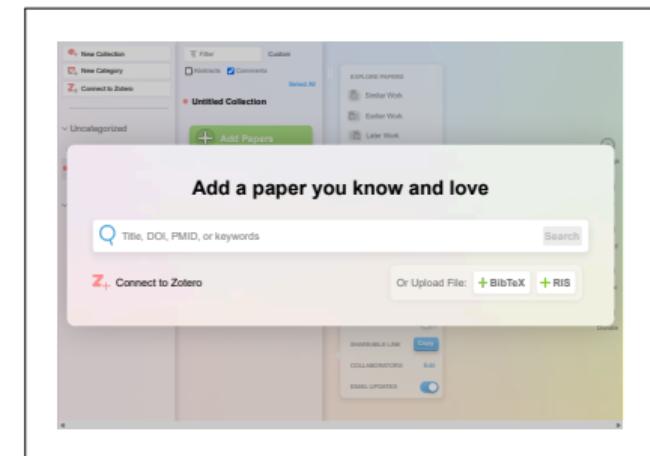
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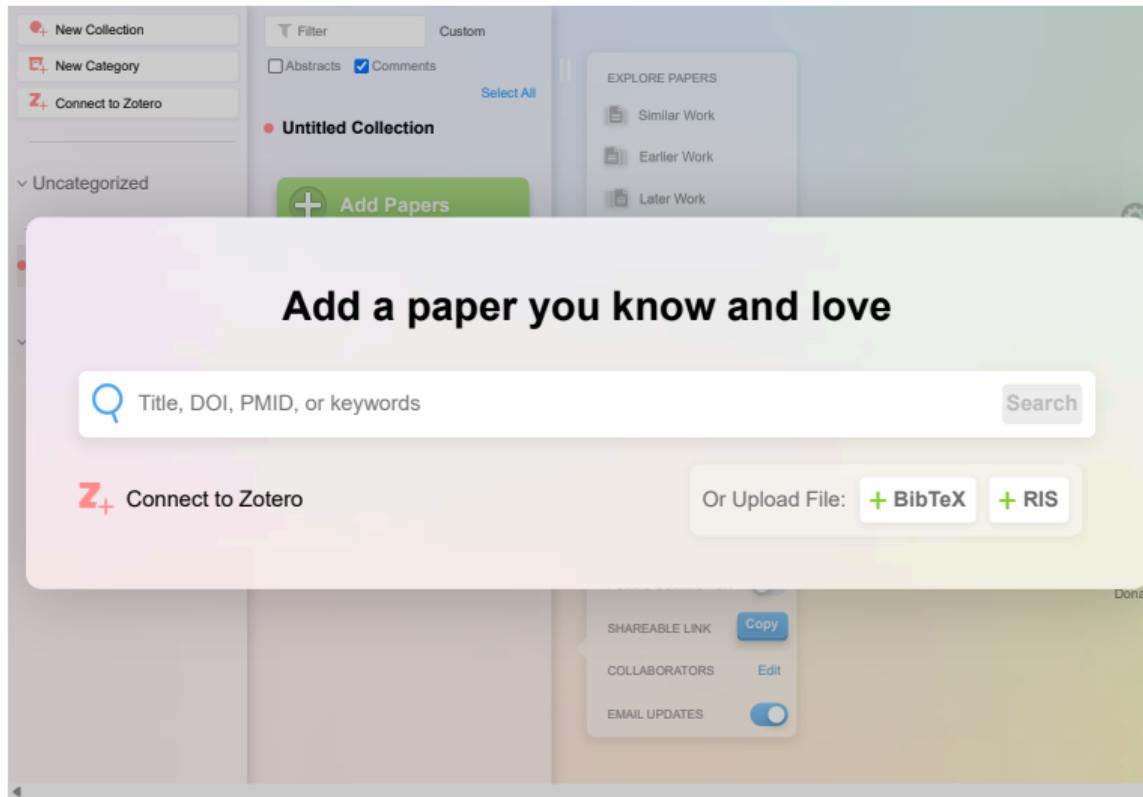
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# ResearchRabbit (<https://www.researchrabit.ai/>)

- Snowballing
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The screenshot shows a search interface for 'XAI in Learning and Assessment Situations'. The search bar contains the query. Below it, there are filters for 'Biomedical & Life Sciences' and 'All Subject Areas'. A large, bold title 'Choose Papers to Power ResearchRabbit's Recommendations' is displayed. The results are powered by SemanticScholar. The first result is a paper by Sharma and Gupta from 2024 titled 'XAI-VSDoA: An Explainable AI-Based Scheme Using Vital Signs to Assess Depth of Anesthesia'. It discusses the challenges of assessing depth of anesthesia and proposes an explainable AI model using vital signs. The second result is by Sruthi and Srivaman from 2024 titled 'Enhancing Zero-Day Attack Detection with XAI-Driven ML Models and SMOTE Analysis'. It addresses zero-day attack detection and uses XAI and SMOTE analysis. Both results have an 'Add to Collection' button.

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New Category

Abstracts  Comments

Q XAI in Learning and Assessment Situations

Biomedical & Life Sciences All Subject Areas

Search

Choose Papers to Power ResearchRabbit's Recommendations

Results powered by SemanticScholar

Sharma, Gupta 2024

XAI-VSDoA: An Explainable AI-Based Scheme Using Vital Signs to Assess Depth of Anesthesia

IEEE Access

Administration of anesthesia is essential in surgical procedures, ensuring patient unconsciousness and safety. Traditional Depth of Anesthesia (DoA) assessment methods rely heavily on the clinical expertise of anesthesiologists and patient physiological responses, which can vary widely due to age, weight, and ethnicity. This variability poses significant challenges in maintaining appropriate anesthesia levels and making timely decisions in critical situations. To address these challenges, we propose XAI-VSDoA, an explainable AI model using vital signs designed to augment DoA assessment by providing accurate predictions and interpretable insights. In this work, we experimented with various machine learning classifiers, including XGBoost, CatBoost, LightGBM, Random Forest, ResNet, and Feed-forward Neural Networks. Among these, the XGBoost model achieved the highest accuracy, with 99.34% on the University of Queensland dataset and 93.07% on the VitalDB dataset. Statistical testing confirmed that XGBoost outperformed the other models. We employed explainable AI techniques such as LIME and SHAP to identify the top 10 features significantly influencing the model's predictions, ensuring the model's transparency and reliability. These methods consistently highlighted the same influential features, reinforcing the model's interpretability. Our proposed scheme demonstrated exceptional performance using numeric vital signs, with XAI techniques validating the key features. This interpretability boosts confidence in the model, enhancing its utility to augment and support the clinical observations of anesthesiologists in anesthesia management. Our findings underscore the potential of XAI-VSDoA as a valuable tool for clinical use, enhancing patient safety and decision-making in anesthesia.

Add to Collection

Sruthi, Srivaman 2024

Enhancing Zero-Day Attack Detection with XAI-Driven ML Models and SMOTE Analysis

2024 3rd International Conference on Artificial Intelligence For Internet of Things (AIoT)

Zero-day attacks, which are defined by their abrupt appearance without any previous detection mechanisms, present a substantial obstacle in the field of network security. To address this difficulty, a wide variety of machine learning and deep learning models have been used to identify and minimize zero-day assaults. The models have been assessed for both binary and multi-class classification situations. The objective of this work is to do a thorough comparison and analysis of these models, including the impact of class imbalance and utilizing SHAP (SHapley Additive exPlanations) explainability approaches. Class imbalance is a prevalent problem in cybersecurity datasets, characterized by a considerable disparity between the number of attack cases and non-attack instances. By equalizing the dataset, we guarantee equitable depiction of both categories, so preventing prejudice towards the dominant category throughout the training and assessment of the model. Moreover, the application of SHAP XAI facilitates a more profound comprehension of model predictions, empowering analysts to analyze the fundamental aspects that contribute to the detection of zero-day attacks.

Add to Collection

The screenshot displays a digital library interface with a sidebar and a main content area. The sidebar on the left includes sections for 'New Collection', 'New Category', 'Import Zotero Collection', 'Uncategorized', 'Collection', 'Untitled Collection', 'Shared with Me', and 'Add Papers'. The main content area is divided into two main sections: 'Similar Work' and 'Connections between your collection and 38 papers'.

**Similar Work:**

- 2024 - **DAV/Dok: An Explainable AI-Based Scheme Using Vital Signs to Assess Depth of Anesthesia** (with 1000 views)
- 2023 - **Enhancing Zero-Day Attack Detection with XAI-Driven ML Models and SMOTE Analysis** (with 1000 views)
- 2023 - **Expligo: An interactive Tool that Helps you Select Appropriate KAI-Methods for your Explainability Needs** (with 1000 views)
- 2023 - **The possibilities and limits of KAI in education: a socio-technical perspective** (with 1000 views)

**Connections:**

Connections between your collection and 38 papers

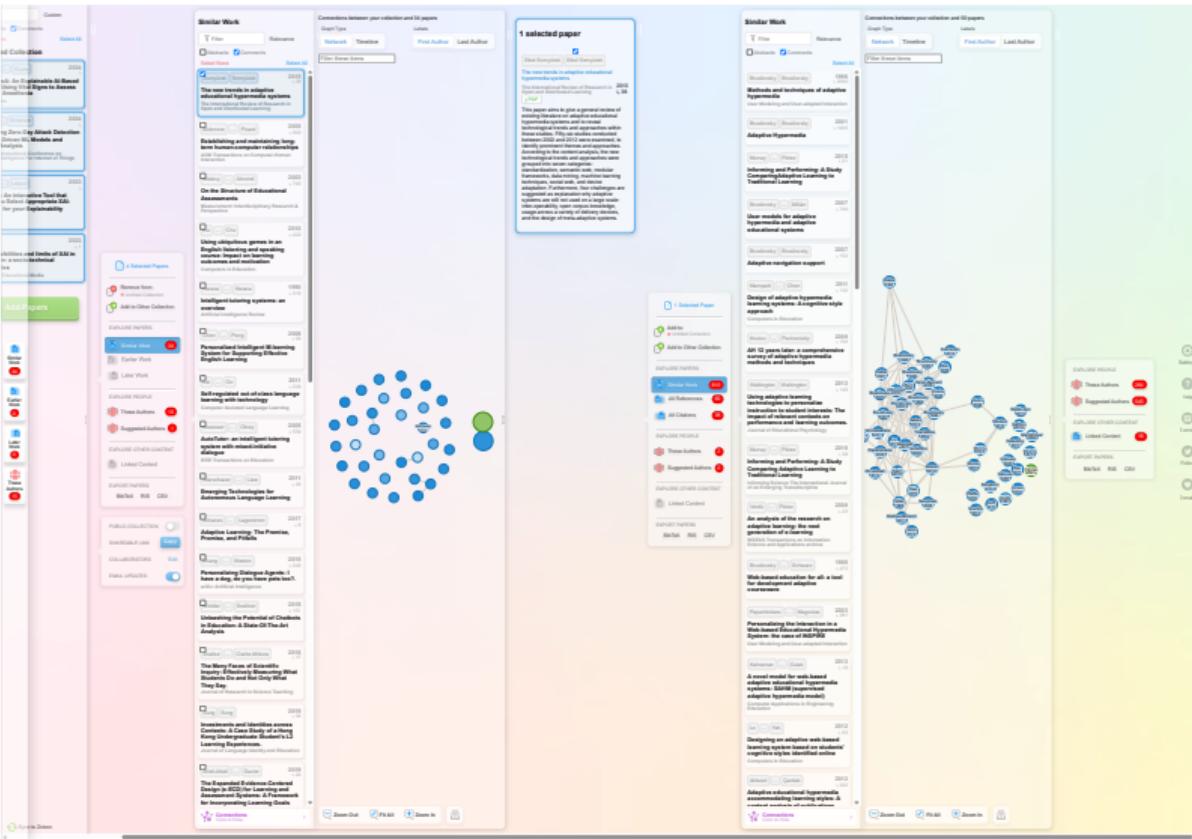
Graph Type: Network, Timeline, First Author, Last Author

Filter these items

The network graph shows a cluster of 38 papers, with two specific papers highlighted: 'Farrow 2023' and 'Zawacki-Richter 2019'. The graph includes controls for 'Zoom In', 'Zoom Out', 'Fit All', and 'Fit Selection'.

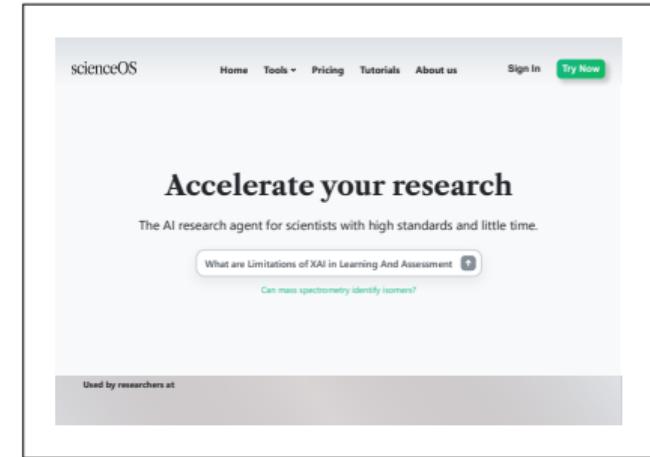
Right sidebar:

- Explore People: These Authors (20), Suggested Authors (40)
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- Snowballing
- Fokussiert auf inhaltliche Relevanz
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## What are Limitations of XAI in Learning And Assessment Situations?

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What are Limitations of XAI in Learning And Assessment Situations?

SM

Explainable AI (XAI) faces several limitations in learning and assessment situations:

1. **Cognitive Overload:** XAI explanations can be too complex for learners or educators to understand, especially when dealing with intricate AI models like deep learning. This complexity may hinder effective learning and decision-making [AI, 2025](#) ; [Rachha, 2023](#) .
2. **Trade-off Between Accuracy and Interpretability:** Simplifying models to make them explainable often reduces their predictive accuracy, which can compromise the quality of assessments [González-Alvay, 2023](#) ; [Yeng, 2023](#) .
3. **Contextual Misalignment:** Explanations generated by XAI may not align with the specific needs of learners or educators, making them less useful in educational contexts [Rachha, 2023](#) .
4. **Mistaking Explanations for Causality:** Users may incorrectly interpret explanations as causal relationships, leading to flawed conclusions in learning scenarios [González-Alvay, 2023](#) .
5. **Evaluation Challenges:** There is no standardized method to evaluate the effectiveness of XAI explanations in educational settings, making it difficult to measure their impact [AI, 2025](#) ; [Rachha, 2023](#) .

These limitations highlight the need for tailored XAI approaches in education to ensure usability and effectiveness.

100 sources

Citation network

How can XAI be tailored to better suit educational contexts?

Are there any successful implementations of XAI in learning environments?

What methods exist to evaluate the effectiveness of XAI explanations?

Expand this answer



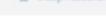
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What are Limitations of XAI in Learning And Assessment Situations? [Download PDF](#)

Replaceable AI (XAI) faces several limitations in learning and assessment situations.

1. **Cognitive Overload:** XAI explanations can be too complex for learners or educators to understand, especially when dealing with intricate AI models (like deep learning). This complexity may hinder effective learning and decision-making. [\[AI Generated\]](#) [\[Review\]](#) [\[Edit\]](#)
2. **Trade-off Between Accuracy and Interpretability:** Simplifying models to make them explainable often reduces their predictive accuracy, which can compromise the quality of assessments. [\[AI Generated\]](#) [\[Review\]](#) [\[Edit\]](#)
3. **Continual Monitoring:** Explanations generated by XAI may not align with the specific needs of learners or educators, requiring frequent updates and re-explanations. [\[AI Generated\]](#) [\[Review\]](#) [\[Edit\]](#)
4. **Marketing Implications for Credibility:** Users may incorrectly interpret explanations as causal relationships, leading to biased conclusions in learning scenarios. [\[AI Generated\]](#) [\[Review\]](#) [\[Edit\]](#)
5. **Evaluation Challenges:** There is no standardized method to evaluate the effectiveness of XAI explanations in educational settings, making it difficult to measure their impact. [\[AI Generated\]](#) [\[Review\]](#) [\[Edit\]](#)

These limitations highlight the need for tailored XAI approaches in education to ensure validity and effectiveness.

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**Authors:**

- 66 This editorial explores the various methods employed in XAI, the challenges faced in achieving interpretability, and potential future directions for the field. [\[2025, Ahmed Hassan\]](#) [\[2025, Junaid Riaz\]](#) [\[aggregation share and review\]](#)
- 66 It is asserted that while XAI in education shares some characteristics with the wider application of explainability approaches in other domains, it also has its own distinctive stipulations that differ from other domains. [\[2025, Junaid Riaz\]](#) [\[summarization\]](#)
- 66 This scoping review critically analyzes the existing literature regarding the explainability and interpretability of AI systems in various academic domains with the objective of identifying limitations that hinder the advancement of Explainable Judicial Intelligence (XJI) in the field of medicine. [\[2025, R. Gordan Abig\]](#) [\[aggregation\]](#)
- 66 A comprehensive overview of recent research on XAI approaches from three well-defined taxonomies is presented, and an in-depth analysis and summary of the status and prospects of XAI applications in several key areas where reliable explanations are urgently needed to avoid mistakes in decision-making is offered. [\[2025, Meng Hong\]](#) [\[Home-Grown Model Survey\]](#)
- 66 The need for more adaptable and interpretable AI systems that can be seamlessly integrated into different educational scenarios while maintaining patient data privacy and ethical standards is highlighted. [\[2025, Meng Hong\]](#) [\[Cite this document\]](#)
- 66 A comprehensive review of the state-of-the-art XAI techniques concerning healthcare applications, including large datasets, and textual explanations, and a range of evaluation metrics for assessing the effectiveness of XAI solutions are provided. [\[2025, Md. Imran Hassan\]](#) [\[AI Computing Survey\]](#)
- 66 This survey serves as a comprehensive exploration of the state-of-the-art in XAI methods and their practical applications, and endeavors to cultivate a deeper understanding of transparency in AI decision-making, empowering stakeholders to navigate the intricate interplay between accuracy, interpretability, and ethical considerations. [\[2025, Junaid Riaz\]](#) [\[advice on Model Selection\]](#)

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Explainable AI (XAI) faces several limitations in learning and assessment situations:

- Cognitive Overload:** XAI explanations can be too complex for learners or educators to understand, especially when dealing with intricate AI models like deep learning. This complexity may hinder effective learning and decision-making. [AI\\_2021](#) | [Kunkel\\_2022](#)
- Trade-off Between Accuracy and Interpretability:** Simplifying models to make them explainable often reduces their predictive accuracy, which can compromise the quality of assessments. [Gorodetsky\\_2022](#) | [Song\\_2023](#)
- Contextual Misalignment:** Explanations generated by XAI may not align with the specific needs of learners or educators, making them less useful in educational contexts. [Kunkel\\_2022](#)
- Mistaking Explanations for Causality:** Users may incorrectly interpret explanations as causal relationships, leading to flawed conclusions in learning scenarios. [Gorodetsky\\_2022](#)
- Evaluation Challenges:** There is no standardized method to evaluate the effectiveness of XAI explanations in educational settings, making it difficult to measure their impact. [AI\\_2021](#) | [Kunkel\\_2022](#)

These limitations highlight the need for tailored XAI approaches in education to ensure usability and effectiveness.

100 sources | Citation network

Sources | Foundational papers | Subsequent papers | Click for details

How can XAI be tailored to better suit educational contexts?

Are there any successful implementations of XAI in learning environments?

What methods exist to evaluate the effectiveness of XAI explanations? [Expand this answer](#)

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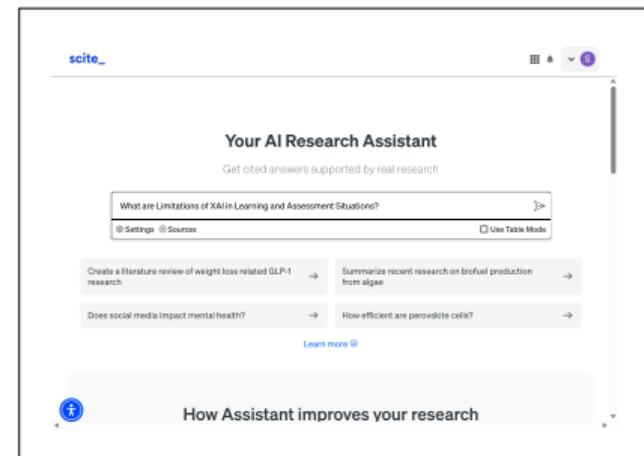
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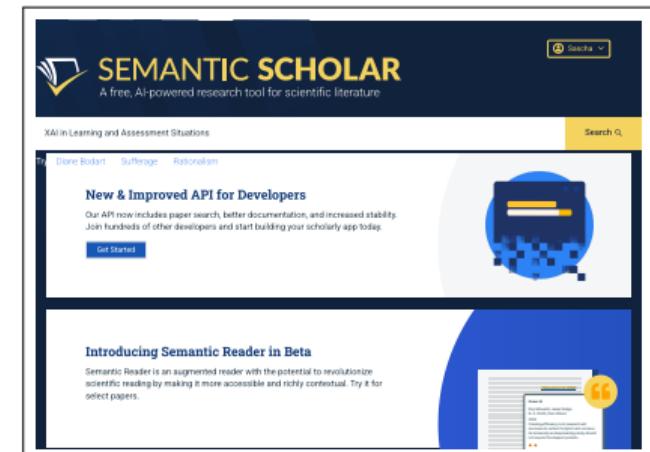
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- Differenzierung zwischen stützenden/kritischen Zitaten
- Eignet sich zur Quellenbewertung



# Semantic Scholar (<https://www.semanticscholar.org/>)

- KI-gestützte Literatursuche
- Filter- und Analysefunktionen
- Breite Datenbasis



The screenshot shows the Semantic Scholar homepage. At the top, the logo and the text "SEMANTIC SCHOLAR" are displayed, followed by the subtitle "A free, AI-powered research tool for scientific literature". A user profile for "Sascha" is shown in the top right. Below the header, a search bar contains the placeholder "Search Q". A navigation bar includes links for "XAI in Learning and Assessment Situations", "Try", "Diane Bodart", "Suffrage", and "Rationalism".

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### XAI-VSDoA: An Explainable AI-Based Scheme Using Vital Signs to Assess Depth of Anesthesia

Neeraj Kumar Sharma Sakeena Shahid +4 authors Rakesh Kumar Gupta

Medicine, Computer Science · IEEE Access · 2024

**TLDR** The proposed XAI-VSDoA, an explainable AI model using vital signs designed to augment DoA assessment by providing accurate predictions and interpretable insights, demonstrated exceptional performance using numeric vital signs, with XAI techniques validating the key features.

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### Enhancing Zero-Day Attack Detection with XAI-Driven ML Models and SMOTE Analysis

C.K. Sruthi A. Ravikumar Harini Sriraman Computer Science ·

2024 3rd International Conference on Artificial... · 3 May 2024

**TLDR** A thorough comparison and analysis of a wide variety of machine learning and deep learning models, including the impact of class imbalance and utilizing SHAP (SHapley Additive exPlanations) explainability approaches are done. [Expand](#)

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### eXplego: An interactive Tool that Helps you Select Appropriate XAI-methods for your Explainability Needs

Martin Jullum Jacob Sjødin Robindra Prabhu Anders Løland Computer Science · xAI · 2023

The growing demand for transparency, interpretability, and explainability of machine learning models and AI systems has fueled the development of methods aimed at understanding the properties and... [Expand](#)

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Zaiwen Ni, Fei Wang, Computer Science, Education - [Computational and Mathematical Methods in Medicine](#) - 2022  
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Computational and Mathematical Methods in Medicine • Published in Computational and Mathematical Methods in Medicine on 26 July 2023 • Education, Computer Science

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  author={Zaiwen Ni and Fei Wang},
  journal={Computational and Mathematical Methods in Medicine},
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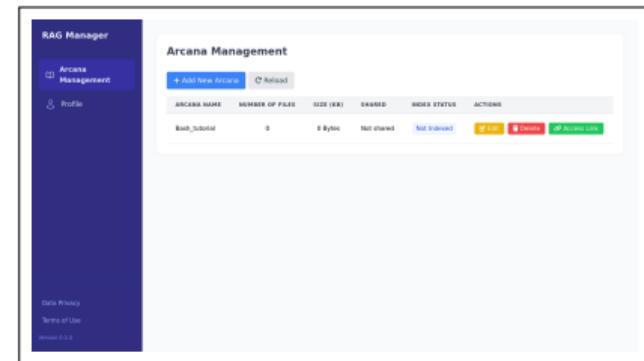
Zaiwen Ni Fei Wang Computer Science, Education • Computational and Mathematical Methods in Medicine • 2022

TLDR An evaluation approach for the quality of vocational education that is based on a thorough investigation of vocational education is provided and research has demonstrated that this approach is capable of objectively and fairly evaluating a teacher's teaching quality. [Expand](#)

10 [PDF] Save

# Arcana (<https://docs.hpc.gwdg.de/services/arcana/>)

- RAG-basierte Suche mit eigenen Quellen
- PDF-Verarbeitung und Annotation



The screenshot shows the Arcana Management interface. On the left is a sidebar with a dark blue background and white text, containing the RAG Manager logo, 'Arcana Management', and 'Profile' options. On the right is the main content area with a light gray background. The title 'Arcana Management' is at the top, followed by a button for 'Add New Arcana' and a 'Reload' button. Below this is a table with the following data:

Arcana Name	Number of Files	Size (KB)	Shared	Index Status	Actions
test_tutorial	0	0 Bytes	Not shared	Not indexed	<span>Get</span> <span>Update</span> <span>Get Arcana</span>

# Typische Anwendungsfälle

- Literatur-Reviews effizient erstellen
- Forschungstrends erkennen
- Paper-Inhalte clustern und bewerten
- Hypothesen mit Studien abgleichen

# Workshop: Literaturrecherche mit KI

- Thema eurer Wahl
- Nutzt mind. ein Tools zur Recherche
- Notiert: Was wurde gefunden? Welche Treffer waren relevant?
- Reflektiert: Welche Limitationen hattet ihr?
- Erstellt eine kurze Präsentation mit Live-Demo

# Diskussion im Plenum

## ■ Präsentation mit Diskussion

## Take-Home-Message

- KI kann Recherche prozesse effizienter gestalten
- Kritische Reflexion der Ergebnisse bleibt zentral
- Datenschutz & Quellenvielfalt sind Schlüsselfaktoren