

Julian Kunkel, Sascha Safenreider  
Carolina Ranfla Jimenez

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



# Agenda

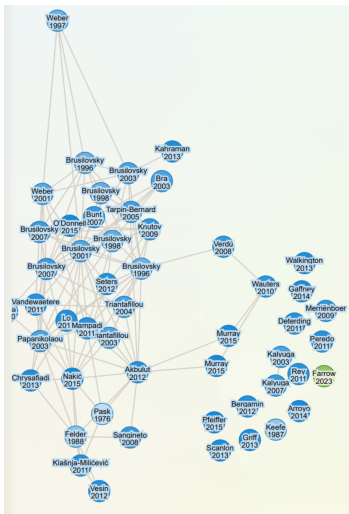
- 1 Einführung in die KI-gestützte Literaturrecherche
- 2 Übungsphase: Recherche mit KI-Systemen
- 3 Diskussion im Plenum: Chancen und Risiken

- Verständnis für KI-basierte Rechertechologien
- Anwendung typischer Tools in der KI-gestützten Literaturrecherche
- Kritische Bewertung der KI-Ergebnisse

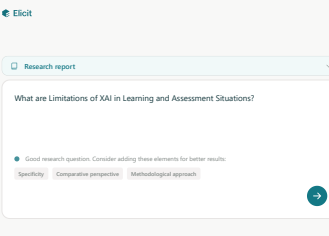




## Was ist Snowballing?



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

- 
- The screenshot displays the Elicit AI web interface. At the top left is the Elicit logo, and at the top right is a hamburger menu icon. Below the header is a light blue bar with a document icon and the text "Research report" on the left, and a downward arrow icon on the right. The main content area is a white rounded rectangle containing the question "What are Limitations of XAI in Learning and Assessment Situations?". Below the question, a blue dot icon is followed by the text "Good research question. Consider adding these elements for better results:". Underneath this text are three light blue buttons: "Specificity", "Comparative perspective", and "Methodological approach". In the bottom right corner of the white area is a dark blue circular button with a white right-pointing arrow.

 Elicit

Research report



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

### Methodological approach



The screenshot displays the Elicit web application. At the top, there's a navigation bar with "Elicit", "Recent", "Library", "Upgrade", "Help", and a user profile "S Sascha". Below this, a header section shows the current topic "Limitations of XAI in Education" with a dropdown menu, progress indicators, and links to "Paper sources" and "View only". A secondary bar contains filters like "Sort: Title (alphabetical)", "Filter", and "Search table".

The main area lists several paper suggestions, each with a title, authors, source information, citation count, and a link to the abstract. The papers listed are:

- "Why Should I Trust You?": Explaining the Predictions of Any Classifier** by Marco Tulio Ribeiro, Sameer Singh, Carlos Guestrin. Source: North American Chapter of the Association for Computational Linguistics, 2016, 15,362 citations.
- A comparison of causal discovery and explainable AI (XAI) for image datasets** by A. Rawal, Adrienne Raglin, Qianlong Wang, Ziyang Tang. Source: Defense + Commercial Sensing, 2024, 0 citations.
- A Critical Survey on Fairness Benefits of Explainable AI** by Luca Deck, Jakob Schaeffer, Maria De-Arteaga, Niklas Kühl. Source: Conference on Fairness, Accountability and Transparency, 2023, 4 citations.
- A Critical Survey on Fairness Benefits of XAI** by Luca Deck, Jakob Schaeffer, Maria De-Arteaga, Niklas Kühl.

On the right side, a sidebar titled "Papers" provides instructions: "Choose papers for screening", explaining that initial suggestions can be added to the library and that screening criteria will be developed next. It includes a "Hide" button and a "Research question" section with the text "What are Limitations of XAI in Learning- and Assessment Situations?". At the bottom of the sidebar, it prompts the user to "Upgrade to PRO to edit this step".

Elicit
Recent Library

★ Upgrade Help ↗
5 Search 🔍

### Limitations of XAI in Education 📄 ▾

● ● ● ● ● Screening criteria View only ▾

< Evaluate screening >
 Return to report >>

Paper	Educational XAI Context	XAI Limitations Focus	Explainability Component
<b>"Why Should I Trust You?": Explaining the Predictions of Any Classifier</b> Marco Tulio Ribeiro, Sameer Singh, Carlos Guzmán <small>North American Chapter of the Association for Computational Linguistics, 2016, 15,362 citations</small> <small>Elicit Search: Abstract Only</small>	No	Maybe	Yes
<b>A comparison of causal discovery and explainable AI (XAI) for image datasets</b> A. Raveel, Adrienne Raglin, Qianlong Wang, Ziyang Tang <small>Defense + Commercial Sensing, 2024, 0 citations</small> <small>Elicit Search: Abstract Only</small>	No	Yes	Yes
<b>A Critical Survey on Fairness Benefits of Explainable AI</b> Luca Deck, Jakob Schaeffer, Maria De-Arteaga, Niklas Kühl <small>Conference on Fairness, Accountability and Transparency, 2023, 4 citations</small> <small>Elicit Search: Abstract Only</small>	No	Yes	Yes
<b>A Critical Survey on Fairness Benefits of XAI</b> Luca Deck, Jakob Schaeffer, Maria De-Arteaga, Niklas Kühl <small>arXiv.org, 2023, 4 citations</small> <small>Elicit Search: Abstract Only</small>	No	Yes	Yes
<b>A Survey on Explainable AI Using Machine Learning</b> ...	No	Yes	Yes

**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

10 / 52

Recent

Library

Limitations of XAI in Education

Extraction definition

View only

Run extraction

Return to report

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, Birgitta Meusling, L. Onnasch, Edlen Roessler Computers in Human Behavior, 2023, 4 citations Elicit Search: Abstract Only	Experimental (e.g., controlled experiment, randomized controlled trial) *	- Specific XAI manipulation: Participants were informed about the error-prone color of bacteria (50% reliability). * - Control/comparison conditions: NonXAI condition where participants were not informed about the error-prone color. - 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. *	- Total sample size: 128 - Demographic information: n - Participant domain or context - Recruitment method: not reported
<b>Designing for Student Understanding of Learning Analytics Algorithms</b> Catherine Yeh, Noah Q. Cowitt, Iris K. Howley International Conference on Artificial Intelligence in Education, 2023, 0 citations Elicit Search: Abstract Only	Experimental (controlled experiment) *	- Specific XAI manipulation: Varying the transparency of limitations of BKT. * - Control/comparison conditions: Providing some information on the algorithm's limitations vs. providing no information. * - Detailed description of how XAI was implemented or explained: Not mentioned in the abstract. *	- Total sample size: not reported - Demographic information: n - Participant domain or context - Recruitment method: not reported
<b>Explainable artificial intelligence for education and training</b> K. Fiolek, F. Farshani, W. Karaszewski, T. Ahrum 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 information on participant characteristics)

Columns

Add extraction columns

Use suggested extraction columns or add your own. Evaluate extraction results and refine column definitions as needed.

Hide

Columns

Study Design Type

Experimental Conditions and Interventions

Participant Characteristics

Study Setting and Context

Key Outcomes Related to XAI Limitations

Trust and Understanding Outcomes

Upgrade to PRO to edit this step

Recent
Library

Upgrade
Help
Sascha

Limitations of XAI in Education
Extraction results View only

Sort: Title (alphabetical)
Search table

Paper	Study Design Type	Experimental Conditions and Interv...	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 Meusling, L. Onnasch, Eileen Roessler Computers in Human Behavior, 2023, 4 citations Elicit Search: Abstract Only	Experimental (e.g., controlled experiment, randomized controlled trial) *	- Specific XAI manipulation: Participants were informed about the error-prone color of bacteria (50% reliability). * - Control/comparison conditions: NonXAI condition where participants were not informed about the error-prone color. - 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. *	- Total sample size: 128 - Demographic information: n - Participant domain or context - Recruitment method: not reported
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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.  
Hide

Status  
✓ Extraction complete

Upgrade to PRO to edit this step



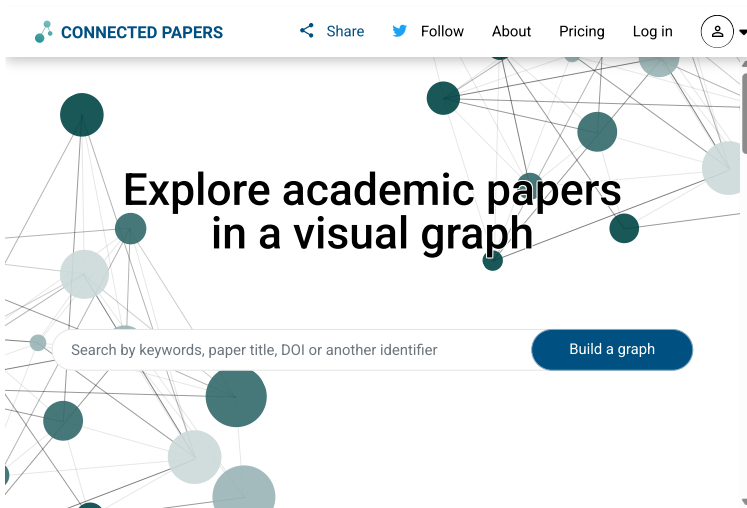
## What are Limitations of XAI in Learning- and Assessment Situations?


These studies indicate that XAI in learning and assessment is hindered by technical, interpretative, and ethical challenges that require context-sensitive approaches to transparency and explanation design. \*





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Showing paper suggestions for "XAI in Education".

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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

[Show more](#)

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

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

PKDD/ECML Workshops 2023.

.. More

2023

Yaganteswarudu Akkem, S. K. Biswas, Anura... 2024

Elvia Melo, I. Silva, Dan Costa, Carlos M. D... 2022

Jinglu Jiang, S. Kahai, Ming Yang 2022

Yaganteeswarudu Akkem, Biswas Sarpi Kumar... 2023

Mohammed Sagr, Sonsoles López-Pernas, Elvis Melo

Yaganteeswarudu Akkem, S. Biswas, Aruna... 2024

Uppal Ehsan, Mark D. Riedl 2021

Moritz Benfle, Holger Trittenbach, M. Poczniak... 2022

Ossama H. Embarak 2023



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While contextual data plays an important role for the outputs generated by AI models, it has not been fully considered when providing explanations about how and why those models generated such outputs. In the current paper we delve into previous research studies in order to provide an overview about the different uses of contextual data when enhancing the explanations for AI models. The inclusion and exclusion criteria are presented and a brief review of previous papers is captured, categorized by different ways to include contextual data into AI models. This paper pretends to foster research in leveraging the potential of contextual information for enhancing AI explainability.

[Prior works](#)   [Derivative works](#)    [List view](#)    [Filters](#)    [More](#)

Ronal Singh, Upol Ehsan, M. Cheong, Mark O... 2021



To make Explainable AI (XAI) systems trustworthy, understanding harmful effects is just as important as producing well-designed explanations. In this paper, we address an important yet unarticulated type of negative effect in XAI. We introduce explainability pitfalls (EPs), unanticipated negative downstream effects from AI explanations manifesting even when there is no intention to manipulate users. EPs are different from, yet related to, dark patterns, which are intentionally deceptive practices. We articulate the concept of EPs by demarcating it from dark patterns and highlighting the challenges arising from uncertainties around pitfalls. We situate and operationalize the concept using a case study that showcases how, despite best intentions, unsuspecting negative effects such as unwarranted trust in numerical explanations can emerge. We propose proactive and preventative strategies to address EPs at three interconnected levels: research, design, and organizational.

## 19/52







⑤ = 1 query



Pro Analysis of 10 papers



⊗ = a query

### 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.

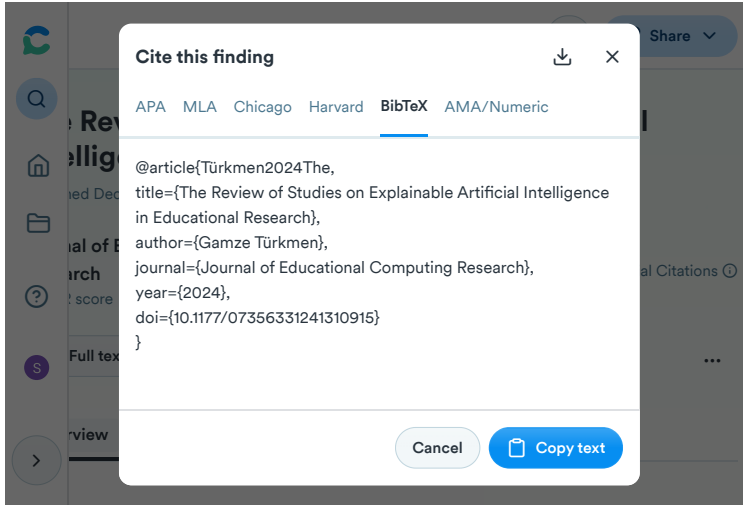
### 3 Explainable Artificial Intelligence in Education: A Comprehensive Review

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

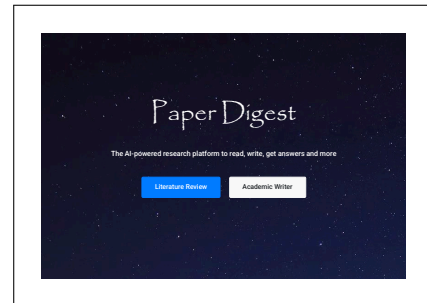
2023 · 7 citations · Elerta Abazi Chaushi et al.

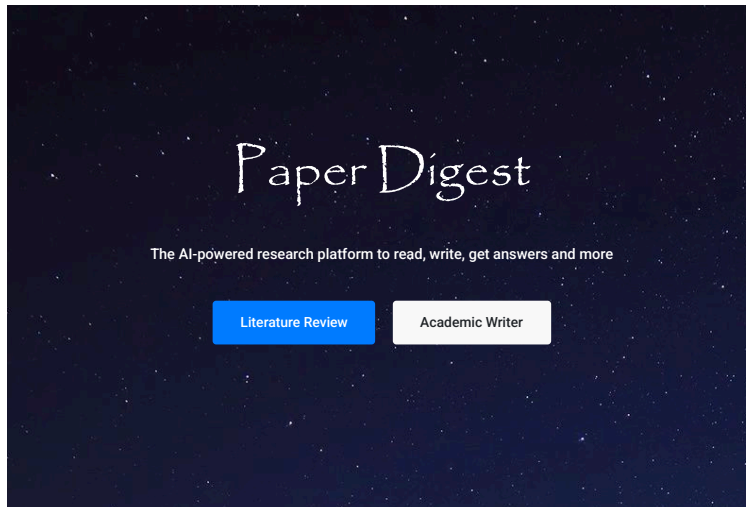




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## Literature Review

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

All Areas

☒ Overview ☐ Research    ☐ Extensive

By: [cyle-trander · covid vaccine · more \(https://www.paperdirect.org/literature-review\)](https://www.paperdirect.org/literature-review) | [review single paper \(https://www.paperdirect.org/reader\)](https://www.paperdirect.org/reader) | [review by venue \(https://www.paperdirect.org/abstract/2020-05-01\)](https://www.paperdirect.org/abstract/2020-05-01)

### Related Sources

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

- | [1]  | An interactive approach to generating explainable   | safety                 |
|------|---|------------------------|
| [2]  | <a href="https://arxiv.org/abs/1808.08147">https://arxiv.org/abs/1808.08147</a>                   |                        |
| [3]  | Explaining AI   | AI                     |
| [4]  | <a href="https://arxiv.org/abs/1808.08147">https://arxiv.org/abs/1808.08147</a>                   |                        |
| [5]  | Separable Artificial Intelligence (SAI): when   | know and what it       |
| [6]  | knows   |                        |
| [7]  | SAI: How an Explainable AI-based  | Using VML to sign      |
| [8]  | the role of explainable Artificial intelligence   | in High-stake decision |
| [9]  | Cloud-based SAI Service for Assessing Open Repository Models - (https://arxiv.org/abs/1808.08147) |                        |
| [10] | Your XAP: Assessing the quality of - Frontiers  |                        |
| [11] | <a href="https://arxiv.org/abs/1808.08147">https://arxiv.org/abs/1808.08147</a>                   |                        |
| [12] | <a href="https://arxiv.org/abs/1808.08147">https://arxiv.org/abs/1808.08147</a>                   | Towards                |
| [13] | AI: A   |                        |
| [14] | <a href="https://arxiv.org/abs/1808.08147">https://arxiv.org/abs/1808.08147</a>                   |                        |
| [15] | Assessing Perceived Trust and Satisfaction with Multiple - (https://arxiv.org/abs/1808.08147)     |                        |

### ■ 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 studies that explore the implications, methodologies (<https://en.wikipedia.org/wiki/curid:620667>), 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 situational awareness [2]. This framework is particularly relevant in high-stakes decision-making scenarios, where the interpretability of AI systems can significantly 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 [2, 7].

In practical applications, XAI has been utilized to improve safety assessments in various contexts, such as autonomous vehicles, where 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://en.wikipedia.org/wiki/Curid:2250081>), thereby enhancing the decision-making process in

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/wiki/Curid:487132>) by providing insights into student performance and engagement (<https://en.wikipedia.org/wiki/Curid:292386>), which in turn fosters a more personalized learning experience (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 acceptance and trust in AI systems (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 up Research (<https://www.paperdigest.org/research/>)

qriAI\_in\_Learning\_and\_Assessment\_Situations)  [https://www.paperkit.net/search?q=qriAI\\_in\\_Learning\\_and\\_Assessment\\_Situations](https://www.paperkit.net/search?q=qriAI_in_Learning_and_Assessment_Situations)  Share

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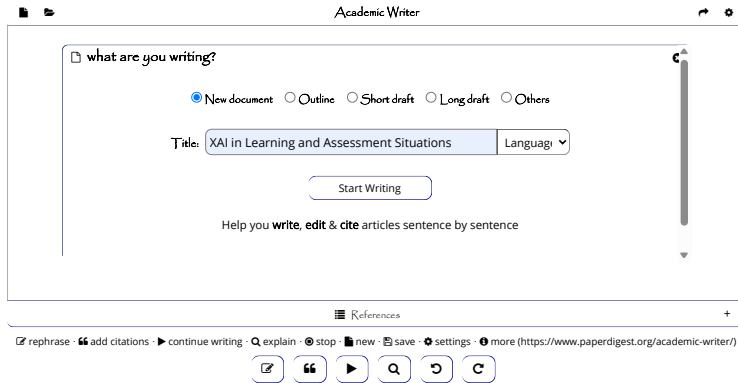
☐ Very Good ☐ Good ☒ Average ☐ Bad ☐ Very Bad

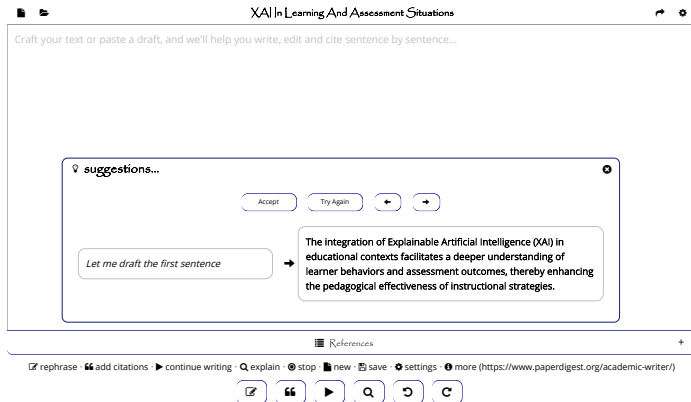
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**XAI In Learning And Assessment Situations**

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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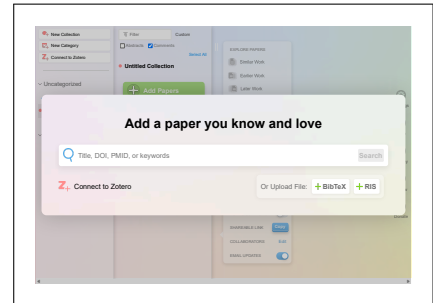
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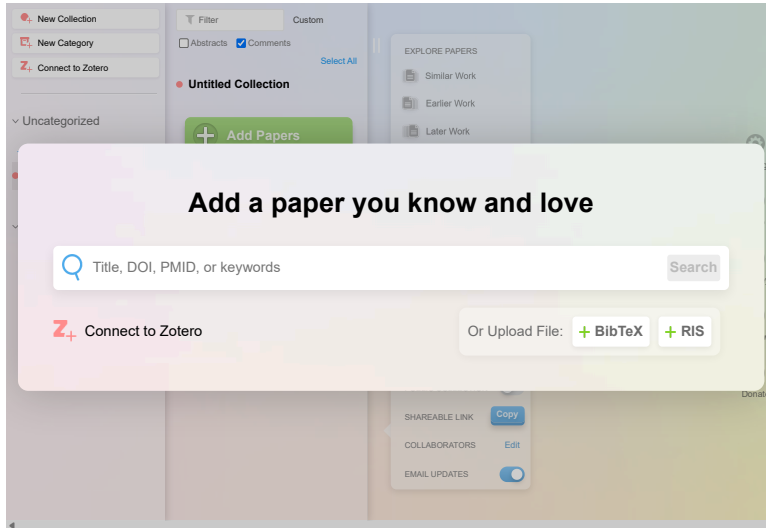
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Sharma et al. Gupta 2024

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

Struthi et al. 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 (AIIoT)

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

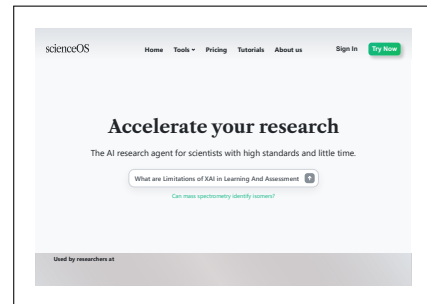
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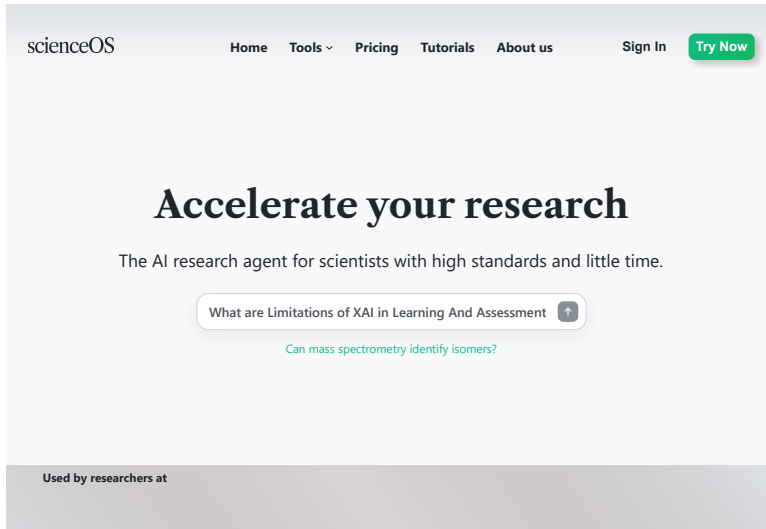




# ScienceOS (<https://scienceos.ai/>)

- Beantwortet Forschungsfragen mit Quelle
- Snowballing
- Fokussiert auf inhaltliche Relevanz
- Gut zur Hypothesenprüfung





The screenshot shows the homepage of scienceOS, an AI research agent for scientists. The header includes the scienceOS logo, navigation links (Home, Tools, Pricing, Tutorials, About us), and a Sign In button. A prominent green Try Now button is also present. The main heading is "Accelerate your research", followed by the tagline "The AI research agent for scientists with high standards and little time." Below this is a search bar containing the query "What are Limitations of XAI in Learning And Assessment" and an upward arrow icon. A green link "Can mass spectrometry identify isomers?" is displayed below the search bar. At the bottom, a section titled "Used by researchers at" is partially visible.

scienceOS

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# Accelerate your research

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What are Limitations of XAI in Learning And Assessment ↑

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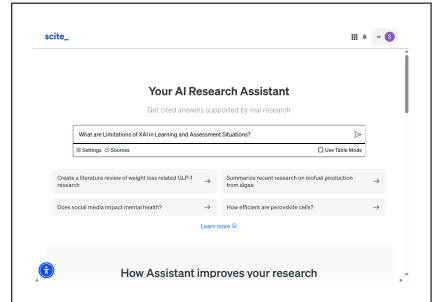


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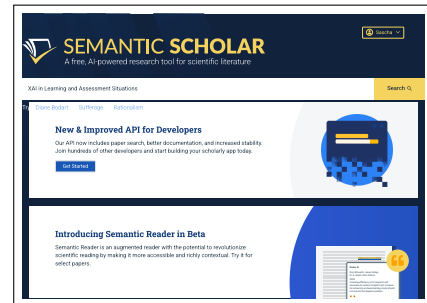
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**XAI-VSDoA: An Explainable AI-Based Scheme Using Vital Signs to Assess Depth of Anesthesia**

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.

[Expand](#) 1  PDF  IEEE  Save  Cite**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](#)

 IEEE  Save  Cite**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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# Retracted: Quality Assessment of Vocational Education Teaching Reform Based on Deep Learning

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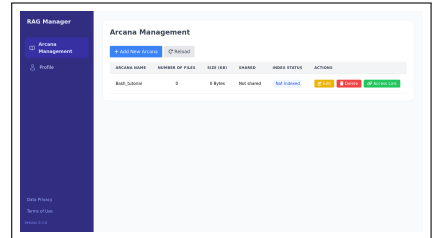
## Quality Assessment of Vocational Education Teaching Reform Based on Deep Learning

Zaiwen Ni    Fei Wang    Computer Science, Education - Computational and Mathematical Methods in... - 2022

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

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- Kritische Reflexion der Ergebnisse bleibt zentral
- Datenschutz & Quellenvielfalt sind Schlüsselfaktoren