



Systematic Review of Online Collaborative Whiteboard Platforms for Higher Education

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Introduction

In recent years, due to advancements in technology, higher education has moved towards a more online, blended and hybrid learning and teaching. This has proved extremely beneficial during times like the Covid-19 pandemic where universities have had to move their courses online due to lockdown restrictions and social distancing measures. It involves making a variety of changes to teaching methods, including replacing traditional whiteboards with Online Collaborative Whiteboard Platforms (OCWP) [1]. However, as of now, there are a large number of different OCWPs available, each providing a different range of features and coming in at different prices, which means it can be difficult for educators to choose a tool best suited for their requirements.

This research project aimed at **identifying the best OCWP according to educational benefits in the context of Higher Education and desirable features from the literature, by conducting a systematic review based on the PRISMA statement.**

Main steps

- 1) A literature review of the possible educational benefits of OCWPs for Higher Education, as well as the features which were found and promoted to help achieve these benefits. The features became the criteria to evaluate OCWPs against.
- 2) A systematic review of OCWPs using an adaptation of the PRISMA [2] statement for reviewing software tools. The systematic review involved identifying all existing OCWPs and testing the ones that passed the eligibility criteria against an evaluation criteria in order to find the best one for higher education.

Evaluation Criteria

1. Recordings
2. Shape Tool
3. Pen
4. Canvas
5. Premade Templates
6. Arrows
7. Text Tool
8. Select tool
9. Files
10. Users not needing to be connected to the same Wi-Fi network to collaborate
11. Pointer allowing to make a temporary mark on the whiteboard
- 12: Virtual sticky notes
- 13: Synchronisation
14. Screen sharing
15. Name tags and different cursors to see position of participants on the board
16. Changing the visibility setting of certain objects to be only be viewed by certain users
17. Activity tracking
18. Students do not need an account to access OCWP
19. Voting
20. Chat
21. Videoconferencing, and sub-criteria

Eligibility Criteria

- Websites or papers describing online whiteboards or synonyms to this term:
 - English only
 - Reliable source
 - If article, published in last 5 years, available via a university license or free
- Software referred to by website/article:
 - Standalone online whiteboard
 - Fully developed and ready to use
 - Free account, free version, free trial or with University of Edinburgh license
 - Written in English
 - Having characteristics of OCWPs
 - If mobile application, downloadable
 - Secure account creation/download page
 - Updated in the last two years;
 - Relevant for higher education

Search keywords in both Google[3] and Google Scholar[4]:

("online whiteboard" OR "digital whiteboard" OR "collaborative whiteboard" OR "whiteboard app" OR "whiteboard application" OR "shared whiteboard" OR "visual online collaboration tool" OR "online visual collaboration tool") AND "higher education"

Results: best Online Collaborative Whiteboard Platforms

1. Systematic review

Place	Software name	Place	Software name
1	Miro [5]	6	Google Jamboard [13]
2	ConceptBoard [6]	7	BitPaper [14]
3	ExplainEverything [7]	8	Microsoft Whiteboard [15]
3	InVision Freehand [8]	9	Limnu [16]
3	Tutorsbox [9]	10	SCRIBBLAR [17]
3	Sketchboard [10]	11	TWIDDLA [18]
4	ZITEBOARD [11]	12	GroupBoard [19]
5	Prowise Presenter [12]	13	Flinga [20]

The best OCWP Tools

The best OCWP was identified as Miro [5] (meeting 85% of Evaluation criteria) followed by ConceptBoard [6] (71%), despite both lacking recording features, a pointer and other features. It was found that both ExplainEverything [7] (69%) and Sketchboard [10] (69%) provided users with most of the features that Miro and ConceptBoard lacked. Tutorsbox [9] and InVision Freehand [8] obtained similar results but for different reasons.

References:

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 [5] <https://miro.com/login/>
 [6] <https://conceptboard.com/>
 [7] <https://explaineverything.com/>
 [8] <https://www.invisionapp.com/freehand>
 [9] <https://tutorsbox.com/en/>
 [10] <https://sketchboard.io/>

References (continued):

- [11] <https://ziteboard.com/>
 [12] <https://presenter10.prowise.com>
 [13] <https://jamboard.google.com/>
 [14] <https://www.bitpaper.io/>
 [15] <https://www.microsoft.com/en-gb/microsoft-365/microsoft-whiteboard/digital-whiteboard-app>
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 [20] <https://flinga.fi/>