Critical Evaluation and Comparison of MS-Teams and BigBlueButton for University Teaching

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Research Direction (Questions)

? What are Conferencing Systems and what technologies are they composed of?

? What are the general advantages and disadvantages of Distance Learning, with means of digital Conferencing Cools, compared to in-class learning?

? How does MS-Teams and BigBlueButton work, what are each`s advantages and disadvantages and what is more suitable for University Teaching and why?

Comprehensive Research Methodology

The focus of the work is on qualitative data, implementing a systematic literature review. The aim is to explore differences between MS-Teams and BigBlueButton, using description and narration methods.

For information gathering, mainly primary data was used, which originates from various scientific works. In addition, selected scientific articles are used as sources of information, most of which are already based on primary data. The WU catalog and the special search engines Google Scholar and Elsevier are the main origin of the collected sources, as well as the respective Webpages and Forums of the Conferencing Tools.

The chosen approach is based on the research problem mentioned before. Existing literary sources are to be linked in order to gain new insights into MS-Teams and BigBlueButton for University Teaching.

Introduction

- Iniobong Fred Akpan and Atim Edet Itighise (2019) assessed the usage of ICT-Tools for Communication at university level

- Use of Conferencing Tools for University Teaching was insufficient

- Finally, current situation leverages use of digital Conferencing Tools

- Therefore Universities need to choose most appropriate tool

Conferencing Tools 1/2

- Synchronous Communication Tools

- Synergy of market relevance and progressive technical development increase importance

- According to Symonenko (2020) Cloud Computing *„is the delivery of applications, platforms, data storage, operating systems, and other computing resources over the Internet instead of over on-premises infrastructure."*

- Microsoft Teams (cloud-based) vs. BigBlueButton (web-based)
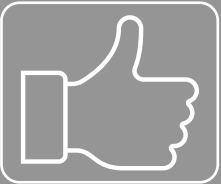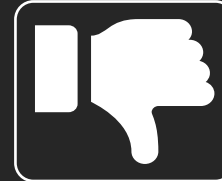
Microsoft Teams General Information
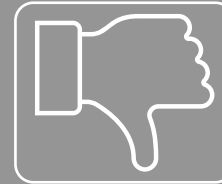
- Proprietory Software Application

- Aggregation of Microsoft technology

- 3-way accessibility

- Up to 250 teams, membership in 1,000 teams, 300 simultaneous participants, availability of recordings up to 20 days

- Security Features – Two-Factor Authentication (2FA), Advanced Threat Protection (ATP), Microsoft Azure Active Directory

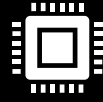# Microsoft Teams in University Teaching

Pros

- 👍 Outlook Integration
- 👍 Private Activity Channel
- 👍 Joint Editing of Documents

Cons

- 👎 Overwhelming Functionality
- 👎 Missing Document Structure
- 👎 Data Security/Privacy Issues (GDPR)

BigBlueButton General Information

- Open-source Conferencing Tool designed to enable web-based interactions with peers

- Based on web real-time communication libraries (webRTC)

- Most recent versions use HTML5

- 100 simultaneous participants possible

- Operator responsible for implementing security measures such as SSL

BigBlueButton in University Teaching

Pros

👍 Device Independence

👍 Deployable in Less Than 15 Minutes

👍 One-Click Link Distribution

Cons

👎 Considerably Long Processing Time of Recordings

👎 Mobile Configuration Issues

👎 Security Threats

Summary: Checklist MS-Teams vs. BigBlueButton

Microsoft Teams	BigBlueButton	General Facts
➢ Up to 300	➢ Up to 100	Simultaneous Participants/Meeting
➢ Up to 20	➢ Unlimited	Recordings Availability (days)
➢ Up to 1000	➢ Unlimited	Different Channels/Rooms
➢ Yes	➢ Yes	Breakout Rooms
➢ No	➢ Yes	Interactive Whiteboard
➢ Yes	➢ No	Custom Backgrounds
➢ 500kbps/1Mbps (Upload/Download)	➢ 500kbps/1Mbps (Upload/Download)	Bandwidth requirements (of a Group Video Call)
➢ Different 365 Licenses	➢ Free of Charge	Licensing Cost
➢ 24/7 Commercial Support	➢ GitHub	Customer Service
➢ Yes	➢ Yes	Mobile Support
➢ No	➢ Yes	Learning Platform Integration
➢ Yes	➢ No	Application Share
➢ Yes	➢ No	File Transfer
➢ Yes	➢ No	Integrated Calendar
➢ Every member by default	➢ Room Owner by default	Start Meeting
➢ Yes	➢ No	Reactions (Emotes)
➢ No	➢ No	End-to-end Encryption
➢ Yes	➢ No	Two-Factor Authentication
➢ Yes	➢ Yes	Polls

Figure 1: Checklist MS-Teams vs. BigBlueButton, Own figure

Discussion and Comparison

BigBlueButton

- Developed for teaching purposes

- The integration with various learning platforms, primarily Moodle, makes BigBlueButton a very viable tool for University Teaching

- The Interactive Whiteboard and Breakout Rooms are suitable for providing good substitutes for physical classes

- Simple handling of Greenlight and little functionality characterize system

- However, the capacity for conferences with larger numbers of participants is lacking, thus reducing the applicability of BigBlueButton to smaller courses

- Furthermore, processing of recordings takes 24 hours

MS-Teams

- Developed for universal commercial purposes

- Great functionality for digital teaching (Outlook integration, joint file editing, …)

- Applicable for larger courses at university (up to 300 participants)

- Digital Innovations (TogetherMode)

- Sophisticated Security Features

- Evaluation functionality with Microsoft Productivity Score

- However, users might be overwhelmed by functionality

- Missing possibility for structuring of office documents in channels

- Issues regarding handling of user data

Cost Comparison Teams vs BBB 1/3

- Total Cost of Ownership (TCO)

- Assumption: Microsoft Teams (Software as a Service) vs. BigBlueButton (on-premises Implementation)

- McKinsey (2007) describes different cost factors for comparing on-premises Software and Software as a Service:

  1. Installation/Implementation Cost
  2. Operations Cost
  3. Licensing Cost for actual Software
  4. Maintenance, Administration

- For our comparison we apply these cost factors to an Office 365 TCO Survey of Forrester (2015), to generate cost estimation

- Reference: Survey was conducted among 7 midsize companies. According to Gartner (2020) a midsize company comprises 100 to 999 employees

Cost Comparison Teams vs BBB 2/3

Costs	Initial	Year1	Year2	Year3	Total
Initial Planning and Implementation	$16,833				$16,833
Hardware	$ 7,000	$ 900	$ 900	$ 900	$ 9,700
Microsoft Subscription and Licenses		$ 44,400	$ 44,400	$ 44,400	$ 133,200
Training	$ 12,500				$ 12,500
Administration		$ 48,750	$ 48,750	$ 48,750	$ 146,250
Additional Bandwidth		$ 5,000	$ 5,000	$ 5,000	$ 15,000
Total	**$ 36,333**	**$ 99,050**	**$ 99,050**	**$ 99,050**	**$ 333,483**

Figure 2: Total Cost of Ownership (TCO) Microsoft Office 365, based on Forrester, 2015

Cost Comparison Teams vs BBB 3/3

- Based on Figure 2, we can now evaluate in what aspects the cost breakdown of the BigBlueButton would differ from the one of Microsoft Teams.

1. BigBlueButton eliminates any licensing costs
2. However, this in turn results in costs, especially for hardware, since on-premises software must be hosted on local servers
3. Requires longer initial planning and implementation phase and more time-consuming training
4. No mutual Service Level Agreements, therefore additional Administration and Maintenance Cost may occur

- Conclusion: Considerations listed must be individually adapted in the specific case of Universities to evaluate which variant would be preferred by the respective University.
  However, Universities must not make mistake to assume that open-source software always generates lower costs overall.

Conclusion and Contribution

- Focus on Research Question: Which Conferencing System is more suitable for University Teaching?

- Answer:
  - Cost comparison must be conducted for individual cases
  - In terms of functionality and capacity Microsoft Teams should be clearly given priority
  - Microsoft`s Service Level Agreements assure that universities can focus on own core areas

  - However, if a university attaches more importance to independence in terms of data storage and data management, selection of hardware and software, and selection of security measures, the use of the BigBlueButton system is recommended.

- Outlook: Based on the findings of this thesis, it is also possible to go into more detail on individual sub-areas, such as Data Privacy in connection with Conferencing Systems.

Limitations

This paper does not compare the technical aspects of communication technologies, but only their usability in the context of remote work.

It links existing primary data/secondary data but does not generate new empirical data.

Sources

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Thank You for Your Attention!