



YouTube vs the status quo: Why distribution platform matters for student engagement with lecture videos

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ABSTRACT

CONTEXT

Pre-recorded video lectures are becoming more ubiquitous in higher education – a trend accelerated by the COVID-19 pandemic. With this comes an impetus for educators to design and deliver video content in a way that is engaging and effective for a new generation of ‘digitally-favoured’ learners. Over the last decade, there has been significant research activity focussed on the design of effective lecture video content and video production factors that influence student engagement. There has been far less research effort directed toward the contribution of distribution platforms. Institutions currently favour closed platforms for video distribution (such as Panopto, Kaltura, Echo360) for reasons of privacy, intellectual property control, copyright protection, and integration with learning management systems. However, these inherently impose accessibility restrictions and often lack features that open and platforms (such as YouTube) offer.

PURPOSE

This study seeks to identify the factors impacting student perceptions of open versus closed video distribution platforms for learning in engineering.

APPROACH

We surveyed students enrolled in two undergraduate mechanical engineering courses that extensively utilised pre-recorded lecture content. We asked an open-ended question relating to how the distribution of this content through an open platform (YouTube) in these courses compared to that through the closed platform (Panopto) used in other courses. Thematic analysis was conducted on the 143 resulting survey responses.

OUTCOMES

Students overwhelmingly preferred video lectures delivered via the open platform. Four strong themes emerged from the data to support this preference: ease of content access, service quality, platform features, and ease of use. Students indicated that when lecture material was hosted on YouTube, they were more likely to engage with it and consume it in greater quantity.

CONCLUSIONS

Our data suggests that students have a strong preference toward YouTube as a video distribution platform, which contributes to increased engagement with lecture video content and improved student experience. Use of such platforms is at odds with institutional practices and policies that arise from privacy, intellectual property leakage, and copyright concerns. Administrators and educators must now decide on the cost-benefit analysis – do the associated risks outweigh the demonstrated benefits?

KEYWORDS

YouTube, video distribution platforms, lecture delivery, video lectures

Introduction

As the usage of pre-recorded video lectures continues to rise, educators are faced with a new set of challenges and opportunities in driving student engagement. Highly accessible tools now allow educators to produce and distribute lecture videos efficiently and effectively. This ability was leveraged during the COVID-19 pandemic where online lectures were widely utilised to support remote learning (Martin, 2020); however, the adoption of pre-recorded lectures was already growing pre-pandemic (Karabulut-Ilgü et al., 2018). Whilst there has been significant research effort directed toward video production factors that contribute to student engagement (Guo et al., 2014), considerably less attention has been directed toward the role of the distribution platform. As positive attitudes toward learning in an online environment continue to grow (Ribeiro, 2020) and we look beyond lecture videos being used as an emergency teaching tool, understanding how distribution platform impacts student engagement would be of benefit to institutions procuring technologies and developing policies relating to video content.

Universities frequently employ 'closed' video distribution platforms (e.g., Panopto, Kaltura, and Echo360) that integrate tightly with learning management systems (LMS). Closed platforms help manage institutional issues around intellectual property (IP) leakage, content copyright protection and student privacy (Panopto, 2021). Despite this, 'open' platforms (e.g., YouTube) have seen widespread usage in tertiary education over the last decade, albeit largely to deliver supplementary or supporting content (Almobarraz, 2018; Jaffar, 2012). Throughout the pandemic some educators opted to deliver lecture content primarily through open platforms – potentially for reasons of personal familiarity, institutional unpreparedness, or suitability. With the waters of online video lectures being thoroughly tested and a wealth of data now available, we are in an opportune position to evaluate the contribution that distribution platforms make toward student engagement.

In this paper we aim to identify the factors impacting student perceptions of open and closed video distribution platforms for learning in engineering. We thematically analyse student feedback as captured in a survey of undergraduate engineering students across two multidisciplinary courses at a regional Australian University.

Background

Open and Closed Platforms

A video hosting platform can be described as either 'open' or 'closed' depending on accessibility factors. Open platforms are typically characterised and designed for access with no payment, account creation, or sign-in required to view content; YouTube, TikTok, and Dailymotion all being examples of open video platforms. Their counterparts are closed platforms which restrict service to only customers, often requiring a purchased institutional set up for users to access hosted content. Examples of closed video platforms in the educational sphere are Panopto, Echo360, and Kaltura.

Student Preferences for Open Platforms

Students already frequently use the open platform YouTube (Auxier & Anderson, 2021). Hosting a diverse library of educational content, it serves as an important informal learning resource for students (Pires et al., 2021). The platform is also frequently utilised by students on their own initiative to support learning in university courses (Almobarraz, 2018; Jaffar, 2012), with students advocating for educators to use it as a supplementary resource in class and to additionally produce their own supplementary content on the platform (Faye, 2014).

Ease of use is a driving force behind the success of many digital technologies and services (Davis et al., 1989), and this extends to educational platforms. University students have demonstrated a preference for open platforms for team collaboration technologies due to factors of ease of use and accessibility (Jang, 2015). Similarly, ease of use and convenience have been identified as factors influencing student choice in non-video e-learning materials (Bringman-Rodenbarger & Hortsch, 2020).

With the wide student adoption of mobile technology (Pew Research Center, 2019), a unique opportunity is now presented for lecture content to be consumed through mobile devices; an experience largely facilitated through dedicated apps which provide a mechanism for video distribution platforms to curate an optimised mobile-centric experience for learners. Competing in a high-value industry and serving a large user base (Aslam, 2018), open platforms like YouTube have enormous incentives to provide a robust mobile viewing experience across a wide range of devices. Serving far smaller audiences, closed platforms may not have the same impetus. User reviews of these platforms on major app stores in Table 1 support this.

Table 1: A comparison of selected open and closed platforms based on data the Google Play Store and Apple App Store. Ratings are an average out of 5 stars. (App Store, 2022; Google Play, 2022)

Platform	Type (Open or Closed)	App Store Rating	Google Play Store Rating	Estimated Google Play Store Downloads
YouTube	Open	4.6	4.2	10,000,000,000+
Dailymotion	Open	4.5	4.4	50,000,000+
Panopto	Closed	2.6	2.4	100,000+
Echo 360	Closed	1.9	2.5	50,000+
Kaltura	Closed	1.6	1.8	50,000+

Open platforms may also offer a more refined and feature-rich experience for users – a result of being in a larger and competitive market. YouTube for example, has released a wealth of features over the last decade to improve user experiences (Marquardt, 2016; Nguyen, 2012; YouTube Blog, 2021). Limited existing literature suggests that provided features of a platform are important to students in supporting their learning. Player controls have been reported to be helpful in studying (McAlister, 2014) and allowed students to consume educational materials according to their self-determined needs (Dart et al., 2020). Linkable videos and YouTube’s video recommendation system has been reported by students to be a supportive feature (Kaw & Garapati, 2011). The comments feature has also been reported to be a forum to raise questions and provide feedback (Dart et al., 2020; Tisdell, 2016). It should be noted however that these student preferences for the platform and its features have been through its usage as a platform for supplementary course resources.

Institutional Incentives for Closed Platforms

Open platforms face a range of issues that closed platforms have been purposed to address. With a need to monetise a free-to-use experience, YouTube has come to rely largely on targeted advertising and data collection, posing a distraction and ethical concern when employed in a learning environment – all issues addressed by closed platforms (Panopto, 2021). These platforms also help manage issues relating to preservation of institutional IP and copyright protection with their ‘walled’ nature (Pinder-Grover et al., 2011).

Closed platforms also possess features not available on open platforms including advanced integration into university LMS, customised deployment options, and integrated live lecture recordings with automatic uploading. They also enable the collection of data analytics for individual students, an important feature for educators and researchers not available on YouTube (Dart, 2022; Panopto, 2021). Finally, while open platforms like YouTube may provide a potentially advantageous environment now, they may not have the impetus to provide this environment indefinitely.

Method

This study seeks to identify the factors impacting student perceptions of open versus closed video distribution platforms for learning in engineering. We focused on two engineering courses delivered at a regional Australian university in 2020 and 2021. These courses were “Engineering Materials” and “Modelling and Control” which typically enrol approximately 300 students each. Each is multidisciplinary, collectively teaching into mechanical, mechatronics, electrical, aerospace and

medical engineering programs. The courses utilised YouTube as the distribution platform for video lecture content. Pre-recorded lecture content was designed in-line with recommendations from Guo et al. (2014), utilising short and highly segmented videos. These videos were uploaded to an open distribution platform (YouTube) where they were organised into playlists of weekly content and published with unlisted privacy settings. This meant content was only accessible through the course channel's playlists page or direct links distributed to students through the LMS, digital textbook, and other communication channels. Through concurrent and prior studies, enrolled students had substantial exposure to lecture content hosted on the institutional closed platform (Panopto).

Data was collected through an anonymous, end-of-semester survey, which was part of a larger study focusing on factors influencing student engagement with lecture videos. Ethics approval was received from the University of Newcastle's Human Research Ethics Committee (approval H-2020-0363). In total, 142 responses were received to the survey question representing a 23% response rate. In this study we focus on student responses to the open-ended question: "How did the distribution of the pre-recorded videos via YouTube compare with the distribution methods used in other subjects (such as Panopto)?"

Thematic analysis was performed on these comments using an inductive approach (Braun & Clarke, 2006). Two researchers independently coded comments addressing the research question in the data. They then iteratively developed themes from the recurring patterns in the codes. Conflicting codes and themes were resolved in a post-theming review to come to a consensus. This generated a set of themes that both researchers deemed reflective of key platform perceptions as reported by students. The final four themes arising from this process were ease of content access, service quality, platform features, and ease of use. Each piece of coded student feedback was then categorised as either positive or negative toward each platform, with each comment able to be counted under all four of these categories for each subtheme, but not more than once in a subtheme's category.

Results

Overall, there was a clear student preference toward video distribution through the open platform (YouTube) compared to the university-supported closed platform (Panopto). Analysis of the open-ended responses reveals the reasoning for this preference, which was divided into four major themes. These are shown in Table 2 along with supporting subthemes. Each is discussed below in no particular order alongside illustrative quotes supporting the theme.

Table 2: Themes drawn from thematic analysis, including the frequency of comments by platform.

Major Theme	Subtheme	YouTube		Panopto	
		# Positive Comments	# Negative Comments	# Positive Comments	# Negative Comments
Ease of Content Access	Hindrance-Free Access	32	1	0	7
	Mobile Accessibility	17	0	0	5
	Content Shareability	7	0	0	0
Platform Features	Video Controls	16	0	0	4
	Progress Persistence	7	0	0	0
	Continuous Viewing	8	0	0	0
	Tangential Content	1	7	1	0
Service Quality	Quality Video Playback	7	0	0	1
	Site performance	12	0	0	7
Ease of Use	Platform Design	31	0	0	5
	Familiarity	20	0	0	3

Ease of Content Access

Students noted that ease of access to content was a key contributor to their engagement, which increased the likelihood of viewing and re-viewing video materials. They highlighted that a platform which introduces additional hurdles, such as needing to navigate multiple pages and lengthy or temperamental log-in process, had a negative impact on their engagement:

"I found it [Panopto] was a hassle to go find the videos as the loading times were annoying as you had to log in and navigate through a bunch of different pages."

Easy mobile access was also identified as a key factor in engagement, with a large population of students appreciating the ability to access a platform on a variety of devices including tablets, phones, and smart televisions: "Using youtube made the experience so much better because it works well with all devices". This mobile friendliness reportedly allowed students to learn more flexibly by enabling easy viewing of lecture content during breaks at work, while commuting, and in free time:

"Mobile viewer friendly is a massive bonus. I found myself watching the [YouTube] videos during spare moments in the day such as while eating lunch due to their accessibility."

The ability to easily share educational materials was found to positively influence engagement. Students valued a platform that allowed them to easily generate shareable links to certain lecture videos and to specific points within a video:

"It can take around 5 mins to get to the appropriate lecture using black board. while with the [Course] website and links to the lectures and the livestreams, it takes seconds."

Platform Features

Player controls were identified to be a significant feature in supporting student learning, with students most frequently reporting video playback speed controls as useful in supporting their learning:

"Consuming lecture material in particular requires being able to scroll and seek for particular moments, needs to be able to speed up and slow down."

Video progress persistence (i.e., the ability of the platform to track and remember viewing progress) was also identified as an important factor as students found that it reduced the difficulty in resuming a lecture after taking a break; this also helped to track course material progress:

"[YouTube] Made it a lot easier to watch the videos and come back to them at a later time, easier to see where i [sic] was up to."

As lecture videos in this course were short and highly segmented (following recommendations of Guo, et al.,(2014)), features such as playlists and auto-playing were perceived favourably. YouTube's features allowed weekly content to be organised and played in chunks or continuously one large lecture, retaining student engagement:

"Heaps better, autoplay of playlists also made it easier to "binge watch" lectures. Quite amazing how easy it is to stop watching when you have to click onto the next video."

There was negative sentiment reported toward tangential content provided by a platform. Students often found the video recommendation feature and advertising on YouTube to be a source of distraction:

"The prominent positioning of the recommended videos feed, and other social media type features acted as a distraction from engaging with course content"

"Google as an advertising platform frequently interrupted my learning to display ads, which I felt detracted from the learning experience."

Students reported that a number of other features aided in viewing materials. For example, students noted that accurate closed captioning "was a great benefit" and that being able to view comments against the video meant that students could "see comments made by the lecturers if they outlined a mistake in the video".

Service Quality

Our analysis has identified specific factors of a platform's service are important for student engagement with lecture video content. Students reported that the ability to stream high quality video with minimal buffering was key, especially when using slower connections.

"Videos rarely buffer on YouTube, while on panopto they regularly stop to buffer and sometime stop all together, requiring browser restarts."

Students expected a responsive site that kept up with their fast-paced viewing needs by allowing them to rapidly navigate within and between videos:

"The responsiveness of the website is so much better which makes viewing lecture content much more enjoyable and greatly increase the likelihood [sic] of rewatching lecture content."

It was also identified that an inconsistent and unreliable platform fostered negative student sentiment, with many students describing the open platform to be "considerably more reliable" and that it had "no issues with loading of pages".

Ease of Use

Platform design is a significant factor of ease of use; a platform with a well-designed user experience (UX) and user interface (UI) allowed easy and intuitive navigation to the desired course content, generating positive engagement:

"It felt very natural to consume course video content through youtube whereas other video sharing services such as Panopto are clumsy and hard to use/navigate."

"The distribution had an anormously [sic] positive effect on my learning and allowed revisiting topics much easier compared to other methods."

Students commonly reported that familiarity with a platform greatly contributed to ease of use. This fostered positive sentiment as familiarity improved student confidence and proficiency in utilising platform tools, navigating to content, and general site usage including managing bugs/issues.

"I've already had interactions with youtube, and so there were little unknowns when using youtube to watch lectures. Whereas in one other subject, which was hosted on ponapoto [sic], I missed lecture videos for the first few weeks of sem 2 because I didn't know where to look."

Discussion

Through thematic analysis, this study found four major themes relating to the role that platform plays in student engagement with video lectures. From this we have generated four key findings and recommendations which are summarised in Table 3 and further discussed here.

Table 3: A summary of findings and recommendations made from the four identified themes.

Findings	Recommendations
A platform generates positive engagement when it allows students easy access to lecture content.	<i>A platform should allow learners to reach content quickly, with as few hindrances as possible via curatable, flexible, and mobile access options.</i>
The features provided by a platform assist students in engaging with lecture content.	<i>A platform should provision features to assist with controlling the flow of information, facilitating a steady viewing experience, and providing a distraction free environment.</i>
Students with a responsive platform that can keep up with fast-paced viewing needs.	<i>A platform should have the capability to stream high quality video with minimal buffering through a responsive, reliable, and consistent website free from issues and bugs.</i>
Students perceive platform ease of use as key to engagement.	<i>A platform should leverage familiarity and a well-designed UI and UX to provide students with an intuitive and easy to use service.</i>

The reported ease of content access is consistent with the technology acceptance model in which perceived ease of use is an influencer of attitudes toward adopting a technology (Davis et al., 1989); highlighting the importance for a platform to reduce the time and steps required to access lecture content. Whilst open platforms inherently provide this, closed platforms may find it challenging to implement a log-in free process due to their restrictive nature. These findings are also in-line with Jang (2015), where students reported a preference toward an open platform due to its ability to provide a less hindered and shorter log-in process while additionally allowing for easy access from mobile devices. With the quantity of students in this study reporting to access lecture content via mobile means, an engaging platform should place a great deal of importance on providing a robust mobile viewing experience.

Although students reported using a wide variety of features to support their study, three broader aspects of a platform that students found assistive in learning are illustrated from these reported features and the four identified sub-themes. The first of these is the student need for tools to control the flow of information to address their individual learning needs, a finding consistent with McAlister (2014) and Dart et al. (2020). The positive reporting of the progress persistence and continuous viewing features highlight the second need of students for a platform to provide them with tools to start and continue their viewing experience; an ability that may become an imperative if lectures trend toward short and highly segmented videos from the recommendations of Guo et al. (2014). The last of these is the students' desire for a platform to provide a distraction free environment. This aspect fostered nearly all negative student sentiment toward YouTube and is an issue that may be challenging for open platforms to address with their monetisation methods.

In analysing comments about quality of service, a tone in student reporting can be observed. This tone is more that Panopto's service is below a standard deemed by students and less that YouTube provides a great quality service. This standard may be largely constituted by an issue-free platform as many positive comments toward YouTube relate to these issues not being present. It is always important for engaging platform to provide students with high quality service, but this reporting highlights an importance for platforms to provide an issue-free learning environment.

Similar to ease of content access, a platform's ease of use is also a reflection of the technology acceptance model's perceived ease of use influencer (Davis et al., 1989). Although the two themes are similar in nature, this study found that students reported them as two distinct factors of an engaging platform. The first being the ease of accessing the platform itself and the second in using the platform after accessing it; it is in this second step where a platform's design plays a large role. As such, there is an importance placed on a platform to provide students with a well-designed UI and UX to allow easy usage of a site. Students also found familiarity to be a large contributor to ease of use. Most reports of this were as a complement to other factors of engagement (e.g., a student finding it easier to navigate through a familiar environment). This highlights the importance of a platform to leverage existing student familiarity, either the adoption of an already familiar platform or of a familiar platform's design cues.

However, these findings are from the student perspective and do not account for educator and institutional perspectives. Closed platforms can address many of the institutional views that their open counterparts cannot. For example, due to their closed nature, they provide an environment free from advertising and tangential content, thus reducing distraction. This closed environment also offers institutions security against IP leakage and a degree of protection from content copyright. Furthermore, closed platforms provide tools that allow control and monitoring abilities, which enable institutions to control maintenance and downtime, student privacy, and the gives the ability to monitor individual student engagement (a feature not present even in YouTube's extensive video analytics).

This list is far from comprehensive, and the implementation of open platforms may require the upheaval, modification, or softening of university policy. Administrators and educators should balance the needs of students and institutions and decide on the cost-benefit analysis of using open platforms. An opportunity is also presented for the development of a platform to address the concerns of both sides. In the meantime, policies should consider the negative impact on student engagement by restricting academics to only using institutionally favoured closed platforms.

Limitations and Future Work

This data was collected as part of a larger study investigating factors of video production influencing student engagement; as a result, lecture content used in this study was designed for online distribution in-line with Guo et al. (2014), solely using short and highly segmented lectures. The data was from only two courses taught by the same educator and only analysed engagement from students' self-reporting. Future work should investigate whether these findings hold true for standard unsegmented 'long-form' lectures from other educators and courses, and additionally student engagement with platforms should be verified through non-self-reporting means.

Conclusion

This study aimed to identify and qualify some of the contributions that distribution platform makes toward student engagement with lecture content. Through thematic analysis of student responses from a survey querying preference between an open platform (YouTube) and a closed platform (Panopto), four major themes of engagement were identified: ease of content access, platform features, service quality and ease of use. In the context of these themes, four key findings and recommendations were made, and it was demonstrated that there was a strong student preference toward the open platform. However, this student perspective is not the whole story and is at odds with several institutional views. The issue of platform choice is now in need of addressing by the community of educators and administrators.

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