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STUDENT PREFERENCES FOR CONTENT IN ONLINE LEARNING ENVIRONMENTS: AN ANALYSIS OF ENGAGEMENT FACTORS

Abstract

The COVID-19 pandemic spurred a shift toward distance learning within education. Online courses have emerged as a prominent mode of remote instruction. While online courses existed prior to the pandemic, their focus was primarily on university students. This study examines the essential content types and features of online courses tailored for secondary school students. Additionally, it explores the alignment between teacher-selected materials and student preferences. Data was collected through lesson observations and interviews with students aged 14-17 in a UK school. Analysis suggests that students favor receiving information through videos, images, and presentations. They also value features such as progress tracking, feedback, and lesson commenting. This study's findings offer guidance to secondary school teachers in the development of online courses for core subjects or exam preparation.

Keywords: distance learning, online learning, web-lessons, teaching services, online courses.

Introduction. Moving to distance learning during pandemic situations bring a lot of problems in the educational field. Such challenges are adapting educational content to the online or web environment.

During the pandemic, teachers and students around the world switched to distance learning. This process took place at a rapid pace and rhythm (Teräs et al., 2020). While students were more digitally literate in the use of various technologies, the situation was difficult for teachers, especially those with a long pedagogical experience.

A range of studies have explored the preferences and perceptions of online learning resources. Slater (2020) found that mature online students favoured accessible, engaging, and assignment-related resources such as online lectures, course notes, primary literature, and tutors' opinion pieces. Lee (2008) extended the technology acceptance model to include internal and external-organizational factors, finding that perceived ease of use and various types of computing support positively influenced the adoption of online learning systems. Vatsala (2014) identified that adult e-learners preferred online and distance education courses, with a preference for longer videos and final assessments in the form of multiple-choice questions. Brown (2004) explored student choice in online learning environments, offering recommendations for improvement. These studies collectively highlight the importance of accessibility, engagement, and relevance in online learning resources.

The purpose of this study is to address the challenges posed by the rapid transition to distance learning during the pandemic, with a specific focus on creating effective online courses for secondary school students. The study aims to define the types of content and features necessary for these online courses, taking into consideration the preferences of students aged 14-17 in a UK school setting. By identifying the optimal content and functionalities, the study aims to provide valuable insights for secondary

school teachers engaged in the development of online courses.

The novelty of this study lies in its specific focus on secondary school students and the types of content and features that suit their preferences in the online learning environment. While online courses were already popular before the pandemic, the shift to distance learning prompted a need for more tailored approaches to suit the needs of younger students. The study also contributes to the field by exploring the relationship between the materials preferred by teachers and those favored by students, shedding light on the dynamics of effective online education at the secondary school level.

The practical meaning of this study is significant for both teachers and students engaged in distance learning. The findings reveal that students prefer information in the form of videos, images, and presentations, emphasizing the importance of multimedia elements in online courses. The identified functions, such as progress data, feedback, and commenting options, provide practical insights for optimizing the online learning experience. Secondary school teachers can use the results to create engaging and effective online courses in various subjects, as well as enhance content for exam preparation. The study thus serves as a guide for educators seeking to navigate the challenges of distance education for secondary school students during and beyond the pandemic.

Main part. The organization of the distance educational process had several types: synchronous and asynchronous learning with the use of digital tools (Shahabadi and Uplane, 2015). Synchronous learning is live, real-time (and usually scheduled), facilitated instruction and learning-oriented interaction (Hyder et al., 2007). An asynchronous teaching method was used to organize learning by providing students with information and all the necessary resources to learn the subject matter regardless of time (Ally, 2004). One option for asynchronous learning is an online course that includes different types of content and required features.

Some of the teachers tried to organize their distance teaching via online courses. But some of them just put presentations and documents in different platform and call it "online course". Kurt defined the online course such a "offer great flexibility as they offer students the opportunity to study whenever and wherever" (Kurt, 2018). There are also some different types of the online courses: synchronous, partially synchronous, and asynchronous (Grechushkina, 2018). But for our research we will use the interactive asynchronous type of the courses.

There are also a lot of research about the online courses (Brooks, 2009; Ralston-Berg, P., & Nath, 2008; Shachar and Neumann, 2010). But most of them linked to the Higher institutions rather than in school, especially about the Massive Open Online Courses (MOOC). One of the reasons is age of the participants: young school students spend time in internet not for the participation in online courses, most of them used web environment for interesting and fun things. But from other hand, students at high school spend a lot of time for the preparation to exam and they use websites with subject specific content. There are some examples of these web sites: khanacademy, seneca, bitesize etc.

To create online courses by teachers or interested individuals, there is a need to understand what type of content is most sought after and used by students to learn the school's subject. A descriptive study by Mtebe and Raisamo (2014) found out that well designed courses tended to increase learners' satisfaction with the system of online courses. Boliger (2004) investigated the main three components of students' satisfaction: instructor, technology, and interactivity. Since the main goal in creating educational content or web lessons is to convey information to students in the form and type that is most understandable and important to them.

In order to highlight the necessary type of content to include in web lessons and environments, we posed the following research questions:

1. What type of educational content should be included in web lessons in an online course for secondary school students?

2. What functions and options should the online course contain for students?

Sub-questions:

- Which online resources students use for learning purposes?

- What's difference between content and websites that different age of students prefers to use?

- Do students prefer the same type of resources which their teachers use in lessons?

Research materials and methods. The study was conducted at Saint Mary Magdalene Academy (London, UK) among 82 secondary and high school students ages 14-17 at the end of the 2020-2021 academic year. Informed consent was obtained from all subjects involved in the study.

Relevance to the research questions:

Age range: The research focuses on online learning resources and functionalities for secondary school students, so choosing participants within this age group ensures direct relevance to the research questions.

Developmental stage: Students aged 14-17 are typically in important formative years for educational practices and learning styles. This age group is likely to have experience with online learning platforms and resources, making their perspectives valuable for understanding their needs and preferences.

Transition between stages: This age range often marks a transition from middle school to high school, potentially involving shifts in curriculum, learning styles, and preferred online resources. Studying this specific group can identify crucial aspects to consider when designing online learning environments for both middle and high school students.

Accessibility: Secondary and high school students are often readily accessible for research purposes through educational institutions.

Consent: Obtaining informed consent from participants is crucial. At this age, students are usually able to understand the research process and provide informed consent, while parental consent may also be required depending on the research ethics regulations.

Generalizability:

While the findings may not be directly applicable to all age groups, studying this specific age range can provide a starting point for understanding student preferences in online learning.

Further research: This study can serve as a foundation for future research exploring online learning preferences across different age groups, building a broader understanding of student needs at various educational stages.

It's important to note that choosing a specific group also has limitations. While the findings provide valuable insights within this age range, they might not be directly generalizable to other demographics like younger children or adult learners.

Therefore, while the chosen sample group allows for a focused and relevant study, it's crucial to acknowledge its limitations and potentially conduct further research in different age groups to build a more comprehensive understanding of online learning preferences across educational journeys.

To answer the research questions, we conducted a survey among students. The survey was conducted at the end of the school year, when students had already experienced the use of digital content offered by teachers of different subjects.

To determine their experiences with participating in online courses or using web-based lessons, students were asked open questions about the web sites they and their teachers used for learning. To identify the preferred types of content among learners to achieve the learning objectives, different types of content were presented such as options to choose. Content types were identified through analysis of lessons and other online courses or web-based lesson sites. Students were asked to rate these types of content from 1 (not important) to 4 (important).

In addition, the same system was used to identify the most important features and options for high performance from the students' perspective.

Digital links to Google Forms and paper-based class questionnaires were used to collect data and survey students.

Lessons from teachers of science, physics, biology, mathematics, and English were observed to identify the websites and digital resources used by teachers.

Results. Since the study involved students from grades 7 to 12, it was decided to divide the students into two groups. 13-15 years old – 22 students and 16-18 years old – 60 students were joined to this research.

The main difference between these two groups is that the second group will take exams in the next academic year. This fact affected to the research results in some questions.

First, we identified students who already participated in online course. There are only 21 students have experience in participating to online course, while other 61 students answered that they didn't participate to any of the online courses. But if we look results in below, we can see that most of the students and their teachers used websites with online courses or online lessons. Without knowing it, the students already had experience in participating in online courses.

Because most of the students didn't participate in online courses before, we tried to identify the students' ideas and their needs about the content in online lessons. We asked them to answer the 1 question: *If there were online course of Science Subject, what would you want to see in online lesson/web-based lesson?*

Table 1 – *results of 1 Question answers*

Content	# of students	%	Rank
Types of Content			
Videos	12	14.6	1
Practical tasks (laboratory work, research etc.)	9	10.9	2
Engaging content (games, humor etc.)	9	10.9	3
Visuals (pictures, diagrams, graphs etc.)	7	8.5	4
Experiments	7	8.5	4
Interactive content	6	7.3	5
Tasks (problems, structured questions etc.)	5	6.1	6
Presentations	4	4.9	7
Subject courses			
Astronomy and Space	3	3.7	8
Physics	3	3.7	8
Chemistry	2	2.4	9
Exams			
Exam topics explaining	5	6.1	6
Exam questions discussion	3	3.7	8
Web-services	3	3.7	8

Distance learning developed teachers and students' digital literacy. During online teaching educators used various types of content: video, presentations, games, interactive boards and etc. According to that, students gained experience with acting these different types of the resources. But it is important to identify, which type of digital information are most useful for them. To find the answer for that, our second question was based on students' experiences during distance learning: "*Which type of digital information help you understand content/topic?"*

Table 2 – *Students answers for second question*

Types of Information	# of students	%	Rank
Videos	40	48.7	1
Pictures (diagrams, infographics)	11	13.4	2
Subject websites	10	12.2	3
Assessment websites	9	10.9	4
Slides	7	8.5	5
Summary Notes	7	8.5	6
Digital textbooks	6	7.3	7
Explanations	5	6.1	8
Animations	4	4.9	9
Practice questions	3	3.7	10
Demonstrations	2	2.4	11

Teachers use different subject specific websites in their work during teaching classes. Therefore, students get used to using the same material as their teachers. To identify and analyse these websites and resources we asked for students answer next question: *"Which websites do your teachers use for their lessons?"*. Additionally, we observed teachers' lessons in SMMA, especially science classes.

Table 3 – *students answer for third question*

Websites	# of students	%	Rank
Own content			
Presentations	12	14.6	4
Content Websites			
Kerboodle	17	20.7	1
PAMT	15	18.3	3
Seneca	9	10.9	5
Maths Genie	5	6.1	7
Hegarthy Maths	5	6.1	7
tutor2u	4	4.9	8
Isaac Physics	4	4.9	8
A-level PhysicsOnline	4	4.9	8
DrFrost	4	4.9	8
Web-services			
YouTube	16	19.5	2
Google services	6	7.3	6
Kahoot	4	4.9	8

Students also use different type of content web sites and web services for their self-study. To compare the content that students and teachers use for educational purposes, we asked for students answer this question: *Which websites do you use for your study?*

Table 4 – *results of students answer*

Websites	# of students	%	Rank
Content Websites			
PAMT	30	36.6	1
Seneca	16	19.5	3
Kerboodle	13	15.6	4
Hegarthymaths	7	8.5	5
tutor2u	6	7.3	6
MathsGenie	6	7.3	6
BBC Bitesize	6	7.3	6
FreeScienceLessons	5	6.1	7
drFrost	4	4.9	8
Chemguide	4	4.9	8
Web-services			
YouTube	23	28.0	2
Quizlet	6	7.3	6
Kahoot	4	4.9	8
Google	4	4.9	8

Online course contents depend on objectives and purposes of the educational material. This is a cause of different styles of online lessons and web learning environment, created by developers of the course. Trying to identify the types of resources and materials used by creator of online

courses, we have analysed some of the online courses for secondary school subjects. After that, we gave students to prioritize this type of content. They rated it's from 1 – not important to 4 – most important.

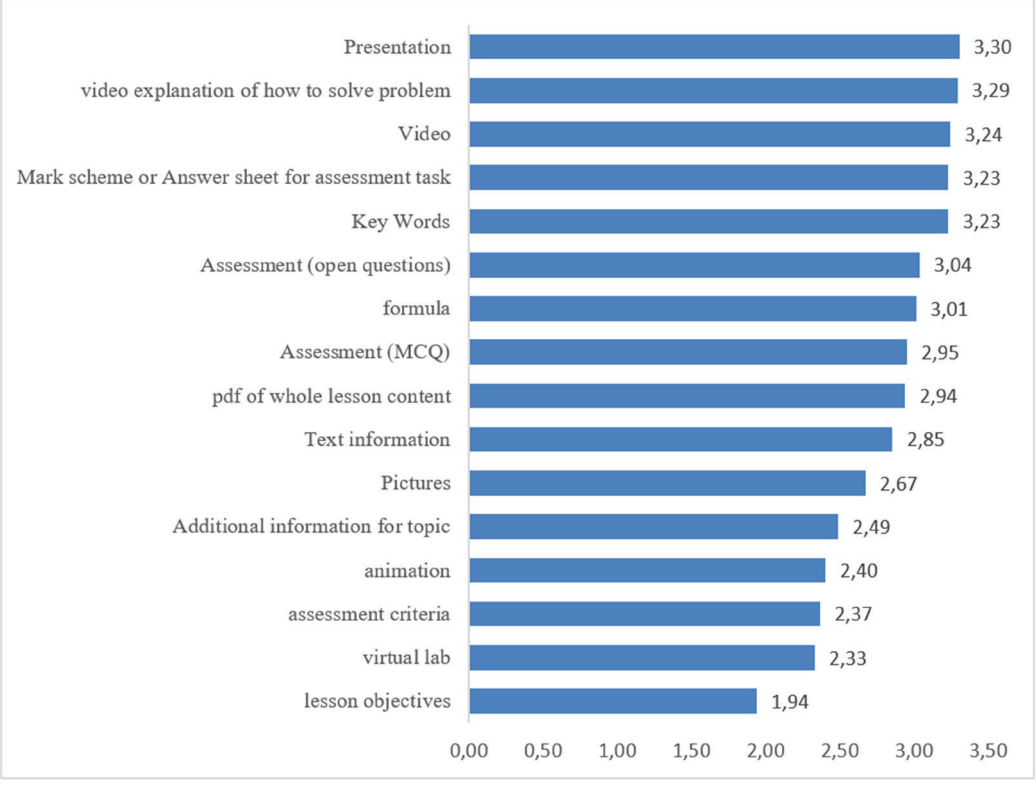

Figure 1 – students answers of type of the content

One of the important factors in using online lessons is the functions that are included when they are displayed on a website or in a virtual environment. The functions such as content can engage students to participate to online lessons. Students also rated selected types of functions and options from 1 to 4.

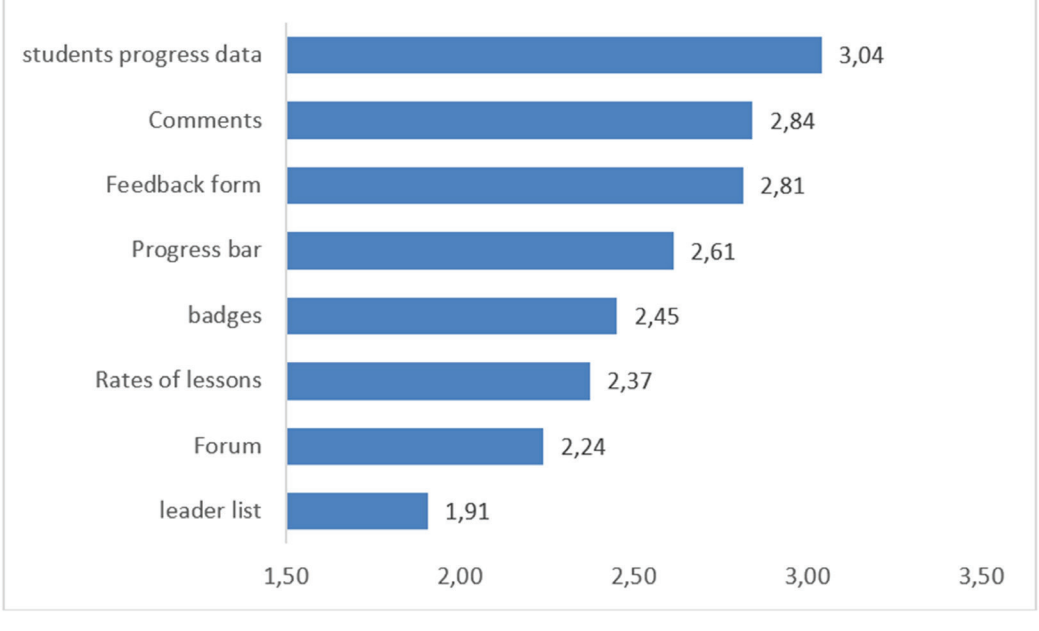

Figure 2 – students' responses of useful functions in online courses

Discussion. During analysis answers of students, we identified three main categories of what students want to see in online course (Table 1). The first category is the "Types of Content": There are identified various types of resources. The second category – Subject courses: students want to see specific subject in web-based environment. The last category is more related to our 2nd group of students, who in preparation to exam – Exams.

Students indicated the different types of resources that are most appropriate for their learning style (Table 2). Most of the students noted formats such as video and images. It can be concluded that this is also facilitated by the development of social networks, where students spend their time. For example, the social network Instagram uses images, and the most popular TikTok today uses the short video format. In addition, teens use YouTube video hosting for both entertainment and educational purposes. It is worth noting that digital textbooks are inferior to presentations and summary notes. Also, the students noted some web sites with content specific and web services for assessing and organizing knowledge.

Based on the students' answers (Table 3), we identified three types of materials that teachers use: 1) Offline content, like presentations. 2) Content websites: mainly websites provided by the publisher of books used by the school, as well as websites that host materials for exam preparation (A-Level) are used. 3) web services.

The websites used by the students were categorized into two categories (table 4): content websites with subject content, mainly for exam preparation, and web services like YouTube.

Although the students in Tables 1 and 2 indicated the primary content type as Video, they chose "presentations" in determining the most important resource type (diagram 1). This is followed by a video explanation of the solution to the problem and a video. Also, students pay special attention to materials for assessing the knowledge and acquired skills. However, lesson objectives are considered least important by students.

Analysing the students' responses by the functions that should be in the online course, "Student progress" and "comments", "feedback" were highlighted (Diagram 2). As a student, it is obviously important to see your progress as you take an online course. In addition, students note the importance of commenting on lessons and giving them feedback from teachers to adjust their knowledge or fill gaps in understanding. Although we assumed that the list of leaders contributes to their competitiveness and greater involvement in the educational process (Sobko et al., 2020).

Conclusion. This study aligns with previous research highlighting the underestimation of informal online learning among students (Paetsch, 2022). While formal online courses see limited enrollment, students actively utilize online resources to supplement their learning (Hamid, 2015). This research confirms the age-related preference for specific content types, with high schoolers favoring exam-oriented materials (Javed, 2018)

Furthermore, it corroborates the established student preference for video, presentations, and image-based content over solely textual or auditory formats (Clark & Mayer, 2023).

Additionally, the current study emphasizes the crucial link between teacher-provided resources and student preferences. This finding suggesting that educators can significantly shape student online learning behavior by incorporating preferred content types and functionalities.

This research identifies feedback mechanisms and progress tracking as crucial functionalities in online learning environments.

The findings of the review show teachers and educational organizations the most important resources and types of the content that they can use to build a web-learning environment in online course.

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