

New Possibilities: A Literature Review on Online Study Rooms and Its Effects on Academic Performance

Zhiliang Yin

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Online study rooms have demonstrated significant potential as a valuable component of education, and educational institutions should give serious consideration to implementing them to enhance students' self-learning abilities. This literature review investigates the impact of online study rooms on academic performance by analyzing past educational theories and connecting them with the present research on online study rooms. It reviews academic and social factors related to academic performance, formulates hypotheses on how online study rooms impact these factors individually, and argues that online study rooms can positively and negatively impact users' academic performance through academic and social factors. After carefully reviewing related literature, this paper finds that online study rooms are capable of both enhancing and discouraging users' academic efficiency by reshaping their environment and community from both academic and social aspects. This key finding demonstrates online study rooms' emerging possibilities as an educational device that should be further investigated by future research. The main limitation of this study is that it is a literature review and does not include specific data that thoroughly assesses the hypotheses. However, despite its limitations, this paper explores the potential of online study rooms to become an integral part of modern educational methodology and future studies should continue to explore this question.

Keywords: Online study room, academic performance, education

Introduction

As the Internet industries continue to develop, there has been increasing diversity in the purposes of social platforms, specifically those of education. Especially during the COVID-19 pandemic, when education and coursework were mainly completed via online meetings, the Internet community gradually acknowledged the educational possibilities of online study rooms (OSRs) and their impact on academic performance. Since the COVID-19 pandemic, there has been a steady increase in the number of OSR users. This trend provides researchers with a crucial opportunity to consider OSRs as a viable form of education and indicates a likely period of intensive growth and application of a previously underestimated educational pathway. A recent survey suggests that studying in OSRs enhances productivity, motivation, and concentration (Garrido, 2023)¹. Despite society transitioning into post-pandemic, OSRs should not be hence abandoned and overlooked as merely makeshift. The mounting need for higher quality and quantity in educational infrastructures and institutions has called OSRs into attention.

Largely dependent on self-regulated learning, OSRs are a form of web-based learning, an innovative approach to education, and differ from offline classrooms in terms of additional flexibility and efficiency. In short, they bring the traditional structure of offline study halls and study rooms to online plat-

forms like private meeting apps (Zoom) or public streaming platforms (YouTube, Twitch). Users can focus on their current academic tasks and discuss or share their immediate progress with other users. OSRs also add various ornaments, such as background music and competitive rankings, to their environment to increase user engagement. Previous research indicates that web-based learning provides feedback with relative ease, is more flexible in course structures, and reaches a larger audience, opening up a potential market while economizing education resources (Hoskins et al., 2005)².

However, OSRs (and many web-based learning models) are not fully recognized or developed by educators. Previous studies have concluded that OSRs and their corresponding research are still in their infancy (Arbaugh, 2000)³. To seek promising future educational strategies and models, modern research needs to analyze the various aspects of OSRs and assess their capabilities to be employed in various institutions.

This paper reviews both academic and social factors of OSRs and discusses their impact on academic performance. The literature review sources were selected from both classic educational theories and contemporary research. Classic educational theories include those that define psychological factors such as self-efficacy and social relatedness, as well as those that address how they change in traditional classroom environments. Contemporary research can be further grouped into papers that

directly investigate OSRs and related articles that present similar models or recorded data of online educational technologies used in institutions. By analyzing early research on factors influencing academic performance and the latest OSR models, this paper synthesizes the effects of OSRs on academic performance. OSRs and web-based learning are potential breakthroughs in the education field. This paper hopes to designate the direction for further research and explore the possibilities of future education.

Academic Factors

Self-Efficacy

OSRs are potentially reshaping users' academic performance by modulating their levels of self-efficacy. Self-efficacy is one's beliefs about their ability to complete given tasks and achieve individual goals (Bandura, 1982)⁴. People who have high self-efficacy are often aware of their strengths and weaknesses. They are more likely to efficiently plan and execute orders and tasks (Bandura, 1982)⁴. In the educational context, students with high self-efficacy are more confident to enroll in challenging courses and meet academic expectations (Zimmerman et al., 1992)⁵. These students are also more inclined to personalize their fields of study and select specialized courses (Zajacova et al., 2005)⁶. Similar results have been highlighted in OSR studies. OSRs boost users with a range of skills, such as self-management, task completion, and computer literacy (Oliver & McLoughlin, 2001; Heinssen et al., 1987; Miura, 1987)^{7,8,9}. For instance, a study conducted on a university-level online learning system indicated that students showed a drastic increase in perceived levels of relative self-management development, leadership, and information/technology management after using the online learning system? (Oliver & McLoughlin, 2001)⁷. While the study's results do not directly support this paper's current hypothesis, it can be inferred that the students' self-assessment does partially reflect their levels of self-esteem and academic confidence. Given the results of Oliver & McLoughlin's⁷ study, it is possible that the online learning environment does affect users' self-efficacy and related factors. This rewarding system that continuously reflects students' academic mastery potentially creates a virtuous cycle. Students with high self-efficacy are more likely to constantly engage in these activities, encouraging self-efficacy when they receive positive outcomes.

OSRs may modify users' self-efficacy by creating a competitive environment and highlighting users' achievements. Self-efficacy is a learned characteristic (Ahmad, 2013)¹⁰. As previously noted, OSRs are grounded by the principles of self-regulated learning. According to Festinger's social comparison theory, in an environment where planning, monitoring, and controlling the learning process are done autonomously, students tend to evaluate their progress by comparing themselves with others (Cho, 2023)¹¹. When students meet their peers, either

through offline or online methods, they automatically engage in social comparison. This action could both boost and reduce self-efficacy. On one hand, previous reports have concluded that, through passive social engagement with other users, students using OSRs gain emotional support (Cho, 2023)¹¹, which can be utilized to enhance self-efficacy. On the other hand, students can also receive negative emotional feedback. For instance, exposure to achievements may increase self-doubt for certain students, which lowers their self-efficacy. Specific research is required to clarify the exact relationships between OSRs and users' self-efficacy.

Self-Competence & Its Components

As a subtype of self-esteem, self-competence refers to an individual's ability to attempt to achieve their goals. There are multiple factors, such as control beliefs, subjective values, and incentives, that influence self-competence. OSRs affect the general degree of self-competence by interacting with these specific factors.

Control beliefs are important in guiding an individual's expectations, which are crucial for stimulating the individual to complete tasks. Traditional research has classified control beliefs into internal and external locus of control (Rotter, 1966)¹². Locus of control refers to an individual's belief in their ability to control their behavior. People who have an internal locus of control tend to believe that they can influence their decision-making, while those with an external locus of control tend to think that external factors, such as the environment, have a greater impact on their actions than their own beliefs and choices. Previous studies suggested that students who do not understand their locus of control often underperform (Connell, 1985)¹³. Logically, students who believe in an internal locus of control usually perform better and are more resilient when completing challenging tasks. OSRs strengthen the internal locus of control, as users can independently decide their objectives throughout a study session. This setting encourages self-competence and motivates users to perform optimally.

OSRs are also personalized implements that users can employ based on users' relative subjective values. In early papers, it has been agreed upon that students often rank the importance of their tasks based on their subjective values (Wentzel & Wigfield, 1998)¹⁴. Without the appropriate reason or incentive, students would not conduct the tasks despite their control beliefs (Wentzel & Wigfield, 1998)¹⁴. The classic models of Eccles (1983)¹⁵ and Wigfield (1994)¹⁶ categorized the subjective task values into interest value, attainment value, and utility value. The definitions of these values are directly shown in their names. Interest value indicates the level of enjoyment or liking that the student has for their activity. Attainment value is the relative significance of the activity to the student personally. Finally, utility value is the perceived worth and usefulness of the activity.

Like the modern construct of intrinsic and extrinsic motivations, these values predicted the students' academic intentions and decisions (Eccles et al., 1983, Meece et al., 1990)^{15,17}. In OSRs, these values can indicate users' motivations for concentrating on their tasks. Users may choose to rely on OSRs to complete tasks that they consider more enjoyable, important, or relevant utility-wise compared to other tasks. Studies conducted in massive open online courses have identified connections between self-efficacy, self-regulated learning tactics, and task values. Data shows that users with higher self-efficacy and clear task values were more likely to employ personalized, independent learning strategies, while users with higher task values alone showed significantly higher average learning scores than those with lower task values (Lee, 2020)¹⁸. Since OSRs are likely to influence self-efficacy, it is plausible that the effects will also apply to task values and other academic components. With proper motivation and adequate control, OSRs can upgrade the quality of users' self-regulated learning sessions by responding to their different levels of subjective task values. Grouping together users based on their reported levels of satisfaction or enjoyment in a certain task can be a useful approach. For instance, users who prioritize more urgent tasks and have high attainment or utility values can be placed in the same room to enhance productivity.

Social Factors

Peer Pressure

As one of the common phenomena in any social group, peer pressure adds to the complexity of individual performance. In OSRs, this duality is further highlighted. OSR users face the opposing needs of revealing and hiding themselves (Cho, 2023)¹¹. The existence of other users is both a benefit and a stressor. It stimulates competitiveness and self-surveillance but also infringes on user privacy.

According to recent interviews, users have reflected that, by observing how others work, they feel more motivated to focus and achieve (Cho, 2023)¹¹. This sense of competition may be positive since the competitors are likely also to be the users' friends and colleagues. This close peer pressure also encourages self-surveillance. Certain OSRs have included fines and penalties to ensure session quality (Cho, 2023)¹¹, and some users have reported that their OSR communities have developed unspoken rules on time management and punctuality (Cho, 2023)¹¹. Users tend to pay more attention to their postures and the appearances of other members. The positive aspects of peer pressure are highly intertwined with the previously mentioned academic factors. A competitive environment, for instance, can often fluctuate users' levels of self-efficacy.

However, peer pressure also brings significant drawbacks. OSR users also reflect wanting to "hide" themselves for privacy and safety issues (Cho, 2023)¹¹. These wants put unneces-

sary distractions and stress to users' routines. The desire to "hide" often contradicts the desire to "reveal", which augments self-surveillance and competitiveness. Users often hide their background, their facial appearance, and their study material in the hope of lowering their self-awareness and distraction (Cho, 2023)¹¹. When conflicting with the desire to "reveal", the desire to "hide" makes the users feel awkward and uncomfortable (Cho, 2023)¹¹. OSRs seem to highlight the users' deliveries and appearances further. Rather than immersing themselves in the environment, a quality of offline study rooms such as libraries, users are presented with webcams that focus only on themselves. The surroundings are often blurred and obscured by virtual backgrounds, leaving the users extra attentive to their looks. This over-concern for self-appearance unnecessarily distracts users from concentrating on completing their academic tasks and hinders academic performance.

Social Relatedness

Users' varying levels of social relatedness may influence the extent to which OSRs affect academic performance. Social relatedness is an individual's sense of belonging in a social group. Past research suggests that feeling socially connected leads to greater acceptance of group goals, while lacking social relatedness may result in rejecting certain goals (Connell & Wellborn, 1991; Ford, 1992)¹⁹. In one specific study, students enrolled in an introductory biology class especially expressed their will to attend online meetings even if they initially preferred offline courses. One student commented that "[the online form] is a good way for groups to study together and help each other understand Biology..." (Sokolove, 2003). In offline classroom environments, students' pursuits and obedience to classroom norms are related to their perception of teacher support and care. If teachers expect challenging but attainable academic standards, treat students equitably, and prioritize student well-being, students are likelier to show prosocial behavior and academic engagement (Wentzel, 1995)¹⁶. Teachers' levels of responsiveness are directly linked to students' sense of connection with the classroom environment. When teachers are attentive and engaged, students are more likely to feel connected and affiliated with the learning environment, which fosters social relatedness and positively affects students' overall academic performance.

In OSRs, the supportive and responsible role of traditional teachers is transferred to the general atmosphere of study rooms. If OSR communities are unresponsive to users' social needs, such as socialization and privacy, users may feel less engaged in online study activities and be less motivated to actively participate in study sessions. This leads to a further decrease in multiple aspects of academic performance, such as academic efficiency and quality. Conversely, if OSR communities consider users' social needs accordingly and provide instant feedback, users could feel like their voices are "heard", and that they are

an integral part of their communities. Users who receive active responses from OSRs may display socializing behaviors and express academic motivation more frequently. This may enhance overall academic performance, and individuals may find online study sessions more effective in improving their focus and productivity.

Research conducted by the University of Zurich during COVID-19 found that although the structures and formats of OSRs alone did not necessarily correlate with social relatedness, there was a positive relationship between the students' perceived relatedness from their lecturers and their in-class intrinsic motivation and engagement (Capon-Sieber, 2022)²⁰. While it is up to future studies to determine the effects of OSRs in practicing social relatedness, it is certain that social relatedness is vital to contributing to a vibrant classroom. In comparison with offline learning environments, however, research also shows that, on average, students felt significantly less related to their lecturer and to the course material during online learning sessions (Butz & Stupnisky, 2016)²¹. However, there is still a significant gap in literature regarding the comparative analysis of online and offline learning environments, which future research should focus on.

Discussion

This paper has briefly explored the likely connections between OSRs and numerous academic and social factors. It combines established theories and research on educational psychology with the current research on OSRs and their educational frameworks. OSRs influence these factors from multiple perspectives; in return, these factors also contribute to the construction of the online studying environment. OSRs have both positive and negative effects on academic performance. For instance, OSRs can boost or diminish self-efficacy and self-competence. Additionally, when users participate in active or passive socialization, social feedback can impact their academic productivity and interest. Together, they impact academic performance from various angles and define the effectiveness of a given OSR setting. Nevertheless, OSRs largely yield positive effects to enhance its users' academic performances according to this paper's findings. Therefore, the widescale, long-term, and official implementation of OSRs is highly recommendable.

Due to limited availability in the number of accessible papers on specific OSR research, further investigation on this topic is needed. Nevertheless, it has yielded some intriguing results and reached certain conclusions that could be expanded upon through future research and studies.

The design of OSRs is strongly correlated with various academic and social factors that impact users' academic performance. Being in its prototypical stages, OSRs do not yet have a standardized structure. As mentioned in the introduction section, OSRs are a vague concept that emerged only in recent years as

byproducts of the reforming educational environment. OSRs are often built on applications and platforms originally constructed for different purposes. For example, many OSR study sessions are carried out on streaming platforms or pre-recorded by individual content creators. This extreme variety and diversity of OSR structures make it difficult to fully assess their functionality and impact on different groups of users. Therefore, future research must be focused on identifying the components and factors related to OSRs under different structures and in different categories of users. Furthermore, general research should be conducted to examine the potentialities of OSRs as a brand-new tool for reestablishing and redefining the field of education. It is possible to design studies and experiments to determine the ideal structures of OSRs that ultimately contribute to nurturing optimal academic performance. OSRs offer a way for people to connect and can also be helpful for clinical psychologists. Researchers can conduct interdisciplinary studies that explore how OSRs impact cybertherapy and mental health.

One of the intrigues of OSRs is their apparent varying extents of efficacy to individuals of different ages, educational backgrounds, and learning styles. For instance, male users were less motivated to initiate web conversations with other users (Arbaugh, 2000)³, and the older generation appears to be more active during online learning than younger adults (Hoskins, 2005)². Online learning has been questioned as a limited approach, and its effects were speculated to not be appropriate and useful for every learner (Hoskins, 2005)². This variability in users' performance outcomes should be investigated more thoroughly in future research to maximize the potentials of OSRs.

It should be noted that OSRs are not yet widely implemented in real-world scenarios. Online learning in general has received resistance and challenges in practice. For instance, one paper marks that lack of support, cost-benefit analysis, and intellectual beliefs are prior reasons why faculties often fail to accept and integrate online learning into the classroom (Mitchell, 2009)²². A crucial practice in implementing OSRs is the engagement of educational staff. With the generational gap and foreseeable technical issues, massive online study rooms that require the attendance of certain professors/faculty members could be difficult to implement. Since the ultimate purpose of OSRs is to educate students, future research should also be focused on the application of OSRs in actual institutions. Fortunately, the present research has already begun with this exploration and presented promising results. Reports have shown that the online learning environment tends to attract only academically driven students (Hoskins et al., 2005)², which is a major concern for OSRs, and analyses have been attempting to improve online learning models by suggesting new constructions that focused on ensuring students' autonomy and increasing the flexibility of online course structures. For instance, "blended learning" has been introduced in multiple institutions. Blended learning integrates offline classrooms with online learning components to

motivate students' interests in learning (Okaz, 2015)²³. Specific examples include Learning Management System (LMS), which enhances education beyond the traditional classroom setting (Okaz, 2015)²³. Some researchers argued that students should be treated as individuals and given a variety of learning options within each course (Twigg, 2003)²⁴. Previous work has also proposed models that encouraged frequent group work and active engagement with course material (Twigg, 2003)²⁴. It is recommended that future research integrate these proposals into OSRs and explore additional alternatives that facilitate students' academic performance in self-learning scenarios. Educators should regularly initiate and host online study sessions to verify and examine these findings while readily improving their qualities through new studies and findings. In conclusion, given its promising aspects and intriguing functionalities, OSRs potentially offer new possibilities as a fundamental frontier of future education.

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