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RESEARCH ARTICLE	**Enhancing Online Teaching Through a Social Constructivist Approach to Digital Technology Adoption**

Vidya Yeravdekar	Dr
	Symbiosis International (Deemed University), Pune
	India
	Email: dr-vidya@symbiosis.ac.in	ORCID: 0000-0002-3400-6166
Ramakrishnan Raman	Dr
	Symbiosis Institute of Business Management, Pune, Symbiosis International (Deemed University), Pune
	India
	Email: director@sibmpune.edu.in	ORCID: 0000-0003-3642-6989

Abstract

The integration of digital technologies has significantly enhanced the potential for effective online education. This study critically compares cognitive and social constructivist approaches in equipping schoolteachers to effectively utilize digital tools for online instruction. Findings suggest that the social constructivist framework—emphasizing collaboration, shared knowledge construction and creative problem-solving—is more effective than the cognitive constructivist approach for facilitating the adoption of digital technologies in online teaching. Online learning, which leverages the Internet and the World Wide Web, inherently aligns with social constructivist principles due to its collaborative potential and interactive nature. Through an integrative review of qualitative research literature, this study also identifies common barriers that impede efficient online teaching. While digital technologies offer diverse and innovative opportunities for educators, their effective application requires ongoing engagement and adaptive pedagogical strategies.

Introduction

The Covid-19 epidemic has caused all Indian schools, as well as schools throughout the world, to switch to an online teaching and learning model. Online classes are still being held on some school campuses across the world. Digital technologies and online teaching learning tools are needed to make the online teaching learning process effective. Three cognitive theories which are mentioned in the literature are Piaget's cognitive constructivism theory, social constructivism theory by Lev Vygotsky and information process theory [1]. The cognitive constructivism theory was developed by Piaget in 1973. According to this theory, knowledge is dynamically built by learners based on their reasoning ability. As per this theory a learner learns to build new knowledge all by themselves and that is largely depend on their existing knowledge. Social constructivism theory postulates that learners are active participants in the process of knowledge creation [2]. The learning happens due to the active interactions between learners and also as per this theory learning happens effectively by interaction between individual members of the small group [3]. The authors have considered both cognitive constructivism theory and social constructivism theory and their respective impact on teacher's ability to learn and use digital technologies for online teaching. The authors have used social constructivism theory by creating groups of teachers from schools and from the University, where University teachers and school teachers were active participants in virtual groups, in the process of knowledge creation for online teaching.

658 – www.imcra.az.org, | Issue 9, Vol. 8, 2025

Enhancing Online Teaching Through a Social Constructivist Approach to Digital Technology Adoption
Vidya Yeravdekar
Ramakrishnan Raman

Review of Literature

There have been studies that describe the problems of online education in industrialized nations, but there is relatively little material accessible for school instructors in India [4]. The online teaching experience has not been a pleasant experience for school teachers [5]. Hass and Joseph (2018) studied the students' perceptions on online learning in comparison to the traditional off-line learning. Their research compared insights from students who had the experience of online learning with those who did not have any exposure to online classes [6]. They studied the student's willing to opt for online programs and finally proposed a hybrid model to get the benefit from of both online and off-line mode of classes[7].

Literature indicates that school teachers lack skills needed for online teaching as the pandemic forced them to adapt to the online classes and there was no time to prepare for the same [8]. For teaching online school teachers have several issues like bandwidth problems, lack of hardware, training, active interaction that is a major block [9]. While the literature indicates several challenges faced by school teachers, one of the prime challenges is the use of online tools and technologies in the online class [10]. Indian schools had not trained their teachers for the imparting education online and there was no time available [11]. Use of technology and adopting appropriate tools of technology for effective online classes was a humongous challenge. [12]

In the open access movement Massive Open Online Courses (MOOCs) are part and it provides an educational option for those who are limited by geography or time [13]. MOOCs have a low completion rate and a high dropout rate [14]. Blended learning is a way of learning that mixes face-to-face education with the use of online digital resources. This offers online and in-person training, Face to Face instructions (F2F). When compared to integrated learning, MOOCs have been demonstrated to be useless.

Interactivity is described as giving online users power while also allowing them to connect with one another. In e-learning, enabling interaction dramatically increased student satisfaction. In an increasingly virtual learning environment, interactivity choices have been highlighted as crucial. This is recognized as an important factor in the production of instructional material. For improving the efficacy of the e-learning process learners have to engage and encourage thinking critically. As a result, interaction is regarded as critical to achieving the goals of e-learning

The notion of the 'Zone of Proximal Development,' as defined by Vygotsky, is the basic theme of 'social constructivism' (ZPD). ZPD may be defined as what a person does not know but can learn (skill or knowledge) by engaging with a more knowledgeable peer. This aspect of social constructivism, in contrast to other learning theories that do not account for the involvement of others in learning, emphasizes the critical relevance of the social environment in learning.

Vidya Yeravdekar has proposed a model of making the University professors collaborate with school teachers in order to enable the school teachers learn by interaction. This is an example of social constructivism in reality.

Research Methodology

121 School teachers delivering online sessions to school students were identified for this study. These teachers were teaching online to students pursing their school education at the primary (Std 1 to 7) and secondary level (Std 8 to 10). The teachers were advised to learn the online tools and the online platforms for online teaching. Some tools were open source and some of them were free but some of them were paid proprietary tools, which could immensely help in online teaching. These teachers were given an opportunity to build on their skills and knowledge all by themselves by adopting cognitive constructivism theory approach. The teachers were given one-month time to explore and learn. Post this they were asked to rate themselves on a scale of 5 for the knowledge that they had acquired with respect to the online tools and platforms.

After the data was collected, virtual groups of school teachers and University teachers were created online, so that they could interact and learn. The interaction was facilitated among the peers and also with university teachers. The teachers were given an opportunity to build on their skills and knowledge and learn using peer group interaction and hence social constructivism theory approach was adopted. Once again, the teachers were given one-month time to explore and learn. Post this they were asked to rate themselves on a scale of 5, for the knowledge that they had acquired with respect the online tools and platforms. The feedback scores were collected using an online form and tabulated for gaining insights. The tabulated scores were analysed and interpreted for appropriate conclusion to be arrived.

Data Analysis And Interpretation

659 – www.imcra.az.org, | Issue 9, Vol. 8, 2025
Enhancing Online Teaching Through a Social Constructivist Approach to Digital Technology Adoption
Vidya Yeravdekar
Ramakrishnan Raman

Sci. Educ. Innov. Context Mod. Probl.| ISSN p (e): 27900169; 27900177

≪IMCRA

The feedback from 121 school teachers was collected. The teachers rated their level of competence between a score of 1 to 5 (1 lowest - 5 highest). They provided their scores for using the online learning management system and also the open source, free and proprietary online tools, which are used for effective online teaching. The feedback scores are provided in Table I

The data points indicate that cognitive constructivism theory approach have given a low score which are in the range between 0.46 to 2.65 out of a maximum of 5 while social constructivism theory approach to learning and equpping them selves yielded scores in the range between of 4.12 and 4.88 out of 5. The findings clearly indicates that social constructivism theory approach to leanring is more effective, and this could be adopted by schools across India. Furthermore, it is obvious from the teacher feedback scores that the instructors felt more secure and that they had learned the tools or platforms employed, resulting in increased teacher satisfaction.

Table 1. Teacher Feedback on Confidence Levels in Using Online Tools and Platforms under Two Constructivist Approaches

S. No.	Online Tool or Activity	Average Confidence Level (Cognitive Constructivism)	Average Confidence Level (Social Constructivism)
1	Online video creation	2.65	4.79
2	Effective online collaboration	1.45	4.69
3	Effective online engagement	1.35	4.75
4	Online quiz	1.89	4.87
5	Online feedback and analysis	1.98	4.39
6	Online submission of assignments	1.78	4.57
7	Online plagiarism checking	0.65	4.12
8	Understanding of online plagiarism	0.46	4.19
9	Online polling	0.67	4.65
10	Online attendance capture	1.34	4.22
11	Effective use of online learning management system (LMS)	2.12	4.88

Recommendation and Conclusion

It has been shown that if school instructors are given the chance to build on their skills and expertise while learning through peer group interaction, they can quickly master online tools and technologies and, as a result, can make online lessons effective.

As new online tools keep evolving to make teaching interactive and effective, teachers can be exposed to new technologies and can learn the same effectively by adopting social constructivism theory approach of learning.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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660 – www.imcra.az.org, | Issue 9, Vol. 8, 2025
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Sci. Educ. Innov. Context Mod. Probl.| ISSN p (e): 27900169; 27900177

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661 – www.imcra.az.org, | Issue 9, Vol. 8, 2025
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