

# The analysis of distance learning based on Vygotsky's Learning Theory

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**Abstract:** This study aims to provide insight into the social interactions and cognitive development of students in a distance learning environment through the application of Vygotsky's theory to address possible barriers to learning in distance learning. The background introduction points out the importance of distance learning in today's education, whilst highlighting the challenges facing the field, such as declining student engagement and poor learning outcomes. The problem statement clarifies the central concern of the study, which is the possible impact of inadequate student social interaction on cognitive development in a distance learning environment. The purpose of the study clarifies the goal of analysing the social learning process in distance learning in depth through Vygotsky's theory and proposing solutions accordingly.

## 1. Introduction

The Social development Theory developed by Vygotsky describes the developmental process of children's cognition, the heart of this theory lies that "The true direction of the development of thinking is not from the individual to the social, but from the social to the individual<sup>1</sup>." His theory asserts that children's cognitive development and learning abilities can be guided and mediated by their social interactions. His theory states that learning is a vital social process rather than an independent journey of discovery. He expanded on this by stating that children's learning benefits from being guided by more knowledgeable members of the community, such as parents or teachers<sup>2</sup>. Distance education, on the other hand, which gradually flourished after the outbreak of the COVID-19 epidemic, compares the new era of learning combined in society (especially the network society) with Vygotsky's theory in order to better analyse the pros and cons of contemporary distance education.

Even if we were to escape the "black swan" of the epidemic for a while, distance education is now playing an increasingly important role in the global education system, and the COVID-19 outbreak has the usage of accelerate this process. Take the example of the world-famous online learning platform Coursera as the example, in 2016, for example, 21 million students signed up for Coursera's online courses, a figure that increases by around 7 million per year over the next two years, according to the renowned online education platform Coursera. But with the outbreak of the epidemic, the shift to remote work triggered a threefold increase in new registrations, bringing the number to 71 million in 2020 and 92 million in 2021<sup>3</sup>. What is clear is

that this particular situation forced teachers, parents and students to adapt quickly to distance learning to ensure continuity of education, while ensuring the necessary physical distance, due to the blockade in the early stages of the outbreak<sup>4</sup>. At the same time, distance learning is not limited to the officially defined education system, as online catechism platforms that teach specific courses or skills for personal development have also developed significantly during the epidemic, allowing people with different cultural backgrounds the opportunity to learn together<sup>5</sup>. Once these people gathering together for learning, the interactions so that have been established, which become a sort of "online society" as the term of "cyber society", which enables them to adapt to a globalised society in a globalised educational environment<sup>6</sup>. This is in line with Vygotsky's theory of learning, which refers to the relationship between learning and society, which has shown that human's learning as a social process and the origination of human intelligence in society or culture. In other words, a person's translation of learning content and results are inseparably linked to the culture and society in which he or she lives. The so called "cyber society" allows people to learn and communicate with people from different cultures and societies, thus providing them with a broader understanding of knowledge that they may won't have within their original culture or societies, which is necessary in today's globalised society, since it is helpful to develop people with intercultural communication skills.

## 2. Making online learning community-based: the cases of Vygotsky's theory for online education platforms

One of the most famous example is the Coursera, the for-profit online education platforms mentioned above. The

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founder of Coursera Daphne Koller, had mentioned the aim of it, “Our dream is that anyone around the world who has an Internet connection, perhaps via a mobile device, will be able to learn the things they care about<sup>7</sup>”. Coursera's technology enables the world's leading academics and teachers to teach large numbers of students without the constraints of location or time. And in addition to high-quality education available anywhere, anytime, it offers learning resources, discussion forums, exercises, wikis and meetups<sup>8</sup>, which makes the term “cyber society” comes to reality.

The operate theory of how distance learning enables the learners to achieve further goals can refer to the concept of Vygotsky's Zone of proximal development (ZPD): If the online teaching and learning environment provides sufficient support, then students can accomplish tasks in this environment that they would not be able to do on their own<sup>1</sup>. The theory has been proven that it is true with the success of Coursera: Coursera reaches 82 million registered users in Q1 2021, by the end of 2020, Coursera had awarded over 12,000 degrees to learners, as well as by 2020, Coursera had raised a total of \$464 million from a series of funding rounds<sup>8</sup>.

In addition to its social attributes, distance learning is a good exercise in independent learning because of it's a relatively highly-free learning practice. Distance learning allows students to have more opportunities for feedback, reflection and revision<sup>9</sup>. This kind of freedom refers to students are free to plan their learning strategies, select learning resources and carry out activities to achieve their learning goals, they also got more chances to get feedbacks from different people, which is vital since high levels of learning independence will be more successful than low levels of learning independence<sup>10</sup>. The online distance learning is more student-centred, so it can create student responsibility and learning independence, a survey of the Department of Electrical Engineering at the Faculty of Engineering, National University of Surabaya, Indonesia, during the great blockade of the epidemic showed that 80.1% of the students finds that the distance learning helps them with the learning independence and they're satisfied by that<sup>11</sup>. In addition, that kind of effect shows more affective with the students of younger generation, since younger generations are spending more time on the internet and social software, so they are more comfortable with online activities<sup>12</sup>.

Moreover, the impact of distance learning is particularly pronounced among younger generations, who are more accustomed to navigating the digital landscape. With younger individuals spending increased amounts of time online and on social media platforms, they exhibit a greater affinity for online educational activities. Villanti and colleagues in 2017 highlighted this trend, noting the comfort and ease with which younger students adapt to and engage with online learning environments. This comfort with digital interactions translates into a more seamless and effective learning experience, enabling students to

leverage the tools and resources available online to their advantage.

The implications of these findings are significant, suggesting that distance learning not only accommodates but actively supports the development of independent learning skills among students. By allowing learners to take charge of their educational experiences, distance learning platforms can foster a more engaged, motivated, and self-sufficient student body. As the landscape of education continues to evolve, the role of distance learning in promoting learning independence and student satisfaction is likely to grow, particularly as technological advancements further enhance the accessibility and effectiveness of online educational resources.

Vygotsky's theory is a good illustration of the effect that students' independent learning benefits from the distance education, which in his theory refers to “We use consciousness to denote awareness of the activity of the mind—the consciousness of being conscious<sup>13</sup>”. Achievement of learning goals through self-regulation (also known as self-management) is the embodiment of “the consciousness of being conscious”. Another point that in Vygotsky's theory that illustrates this benefit is self-regulation. For Vygotsky, self-regulation is the intentional control of one's attention, thoughts and actions; it is a fundamental feature of human behaviour that stimulates the social forces of the system by to achieve<sup>13</sup>. Distance learning allows students to study without the constraints of the real world (which are significantly stronger than those of the “cyber society”)<sup>14</sup>. Students need to complete learning tasks through their own independence, the environment in which distance learning takes place plays an important role; the types of tasks students perform while studying at a distance, the socially constructed stimulus systems they are introduced to, and the introduction of scientific concepts all have an impact on the intentional control of behaviour and action, which is reinforced by the relative independence of distance learning.

### 3. Limitations

Despite the benefits of distance learning for individual student development through Vygotsky's theoretical analysis, however, both current distance learning and Vygotsky's learning theory have their limitations.

The most obvious problem is distance education itself - although it now meets essentially all the needs of the real classroom, even without the restrictions of location and time, it has less impact on students than the real classroom in terms of social attributes. Especially for subjects that require extensive manipulation or experimentation. As a survey of Pakistani dental students and teachers on distance learning during the COVID-19 pandemic in March-April 2020 showed, for dentistry, which requires a lot of hands-on work, only distance learning can do little to help their operational skills, as one teacher said in the survey, "In anatomy, research through models is good. But hands-on training is not possible and students will not be able to understand it properly. Skills need practical hands-on training." This shows that current online learning still lacks the ability to

engage students in meaningful and challenging activities to promote their knowledge, as mentioned by Vygotsky<sup>1</sup>.

In addition, there is a strong correlation between the effectiveness of online learning and teacher-student interaction, which refers to how well students acquire knowledge is largely dependent on teacher-student interaction. This is the importance of the socially constructed stimulus system proposed in Vygotsky's theory, and it is because of the freedom of distance learning, where students are free to choose whether or not to interact with the teacher to a greater or lesser extent, that there is a lack of social (i.e., their own learning community) stimulation, especially if distance learning is not as social as real teaching, that this deficiency becomes more apparent. As one of the teachers surveyed in the qualitative study by the Pakistani dental college said that, "We should interact with students who are not active listeners. The student interaction is only through the assessments and we will be able to access the students<sup>15</sup>."

The nexus between the success of online learning environments and the dynamics of teacher-student interaction is increasingly evident, underscoring a pivotal aspect of educational theory. The extent to which students assimilate and apply knowledge is significantly influenced by their interactions with educators. This phenomenon underscores the critical role of the socially constructed stimulus system posited in Vygotsky's theory. According to this perspective, learning is not merely an individual cognitive process but is deeply embedded within and shaped by social interactions. The unique nature of distance learning, which grants students the autonomy to choose the level of engagement with their instructors, brings both opportunities and challenges in this context.

The flexibility inherent in online learning can lead to a divergence in the intensity and quality of teacher-student interactions. While some students may thrive in this autonomous learning environment, others may struggle without the direct and regular stimulus of a learning community. This disparity can lead to a diminished social stimulus, a factor that Vygotsky deemed essential for effective learning. Particularly in distance learning contexts, which may lack the immediacy and intimacy of face-to-face interactions, the potential for reduced social engagement is a significant concern. The social aspect of learning, pivotal in Vygotsky's theory, is thus compromised when the digital medium does not facilitate or actively promote sustained and meaningful interactions between teachers and students.

This challenge was vividly illustrated in a qualitative study conducted by a Pakistani dental college, where one educator highlighted the necessity of reaching out to students who are not naturally inclined to participate actively in the learning process. The observation that "We should interact with students who are not active listeners" reflects a proactive approach to teaching that seeks to bridge the gap in engagement. The teacher further notes that interaction is predominantly through assessments, indicating a need for more diverse and

frequent forms of engagement to fully understand and support students' learning journeys.

This scenario emphasizes the importance of innovative strategies in online learning that can simulate the social aspects of traditional classroom settings. It suggests that educators must employ a variety of interactive methods, beyond conventional assessments, to foster a more vibrant and responsive learning community. Such approaches could include synchronous discussions, collaborative projects, and regular feedback sessions, which can help replicate the social stimuli crucial for learning as proposed by Vygotsky. Therefore, enhancing teacher-student interaction in online platforms is not merely a matter of replicating face-to-face teaching methods but requires a thoughtful adaptation of Vygotsky's insights to the digital age. This adaptation is crucial for creating an engaging and effective online learning environment that caters to the diverse needs and preferences of students, thereby ensuring that the potential of distance learning is fully realized.

Despite of the limitation of the present online distance learning, the Vygotsky's theory itself also has its limitations as follows: One, of the most obvious point, is that Vygotsky's theory, while seemingly plausible and logical, lacks experimental testing, and he relies extensively on observations of subjects to prove his findings, as he believes that social interaction is a key factor in learning. His vague definition of social interaction, which does not specify the best way to engage with others<sup>16</sup>. This point is evident in the previous arguments for online learning, although Vygotsky's theory that students can make progress through a 'cyber society' still fails to specify how to engage with students in order to achieve the best learning outcomes.

Furthermore, Vygotsky's conceptualization of social interaction remains frustratingly nebulous. He does not delineate the optimal forms of engagement that facilitate learning, an omission that becomes particularly glaring in the context of online education. The advent of digital platforms has transformed the landscape of social interaction, creating a 'cyber society' where traditional norms and methods of engagement are continually evolving. Vygotsky's theory suggests that students can advance their learning through participation in this digital social milieu. Yet, it falls short of providing concrete strategies for educators on how to effectively harness these interactions to enhance learning outcomes. This lack of specificity poses a significant challenge for applying Vygotsky's principles to the design and implementation of online learning environments, where the dynamics of social interaction differ markedly from those in traditional classroom settings.

Another point is about the ZPD itself, it is clearly too vague and general for the whole process of students' knowledge development. It also does not explain how students' learning needs are created<sup>17</sup>. As learning outcomes and performance vary greatly between individual students, the learning processes referred to in the ZPD are not necessarily applicable to specific groups (e.g. people with learning disabilities) due to their learning processes. Furthermore, ZPD does not necessarily apply to all cultural groups, and we should acknowledge that there are cultural groups in the world that are opposed to learning and modern social systems (such as the Amish in North America, who refuse education because of their

religious beliefs) and whose education cannot be explained by ZPD.

#### 4. Conclusion

In summary, Vygotsky's learning theory has its limitations in that it does not cover all groups of students and does not clarify how specific developmental and learning processes arise. Overall, Vygotsky's theory demonstrates why distance learning, apart from the epidemic outbreak factor, will gradually become trendy as society develops, and the benefits it brings to the cognitive level development of the educated. At the same time, this theory also points out the limitations of current distance learning and, despite the theory's own limitations, it provides useful suggestions for how distance learning should develop in the future, although the theory itself has the limitation of lacking in comprehensiveness, experimental validation and interpretation of individual and cultural differences, it still illustrates the current shortcomings of distance learning which cannot truly replace offline learning due to its lack of social dimension.

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