

## **Connectivism Learning Theory and Connectivist Approach in Teaching and Learning: A Review of Literature**

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### **\*Abstract**

*Connectivism is a learning theory that emphasizes the importance of connections and networks in the process of acquiring knowledge. This paper presents a comprehensive review of literature on the Connectivism learning theory and Connectivist approach in teaching and learning. The purpose of this study is to examine the theoretical foundation, key principles, and practical implications of Connectivism in education. The study employs a systematic literature review method, and a total of 50 peer-reviewed articles published between 2005 and 2022 were selected for analysis. The findings reveal that Connectivism offers a new paradigm for learning that is based on the premise that knowledge is distributed across networks of people, technologies and organizations. This approach to learning recognizes the changing nature of knowledge and the importance of staying connected in a rapidly changing world. The study identifies several key principles of Connectivism, including the importance of creating and maintaining connections, leveraging technology to access and share knowledge and valuing diversity and autonomy in learning. The practical implications of Connectivism in education include the need for educators to adopt new pedagogical strategies that support the development of networked learning environments, facilitate learner-centered instruction and promote lifelong learning. Overall, the review highlights the potential of Connectivism to transform traditional models of teaching and learning and offers insights into the design of innovative educational practices that leverage the power of networks and connections to support learning in the digital age.*

**\*Key Words:** *Connectivism Learning Theory, Connectivist Approach, Teaching and Learning, Review of Literature, George Siemens, Stephen Downes.*

## **Introduction**

The Connectivism learning theory and Connectivist approach of learning is a relatively new concept that has emerged in response to the changing landscape of education in the digital age. This approach is based on the idea that knowledge is distributed and that learning occurs through the connections that individuals make with others and with information. In this paper, I explore the key principles of the 21<sup>st</sup> century learning theory connectivism and connectivist approach, its applications in various educational contexts, and the challenges and opportunities it presents for learners, educators, and institutions. The purpose of this study is to examine the theoretical foundation, key principles, and practical implications of Connectivism in education. The study employs a systematic literature review method and a total of 50 peer-reviewed articles published between 2005 and 2022 were selected for analysis.

## **Analysis of Connectivism Learning Theory**

Connectivism is a learning theory that emphasizes the importance of social networks and technology in the learning process. Developed by George Siemens and Stephen Downes in 2005, Connectivism suggests that knowledge is distributed across networks and that learning involves the ability to recognize and navigate those networks. Connectivism posits that knowledge is not only acquired through traditional means such as textbooks or lectures but also through online communities, social media, and other technological platforms. According to the theory, learning is an ongoing process of exploration and discovery, and it occurs both within and outside formal educational institutions. Connectivism also suggests that learners must be able to critically evaluate the information they encounter in order to discern what is reliable and relevant. The ability to make connections between different sources of information and knowledge is also critical, as it enables learners to construct new knowledge and adapt to new situations.

Critics of Connectivism have argued that the theory places too much emphasis on technology and social networks and overlooks the importance of other factors such as motivation, individual differences in learning styles, and the role of the teacher. However, proponents of the theory argue that Connectivism represents a new and innovative approach to

learning that acknowledges the changing nature of knowledge and the importance of technology in contemporary society.

Overall, Connectivism provides a valuable perspective on learning in the digital age, highlighting the importance of social networks and technological tools in the learning process. By embracing the principles of Connectivism, learners can acquire the skills and knowledge they need to navigate a rapidly changing world and continue to learn throughout their lives.

### **Connectivism: 21<sup>st</sup> Century Learning Theory**

Connectivism is a learning theory that emerged in the early 21<sup>st</sup> century as a response to the increasing complexity and interconnectedness of the digital world. The theory posits that learning is a process of making connections between concepts, ideas and experiences, and that these connections are facilitated by technology and social networks. In this essay, we will explore the principles of Connectivism, its applications in the 21<sup>st</sup> century, and its implications for the future of education.

The applications of Connectivism in the 21<sup>st</sup> century are vast and varied. With the advent of the internet and social media, learners have access to a vast array of information and resources, and can connect with others around the world to share knowledge and ideas. Online learning platforms, such as Coursera and Khan Academy, have made education more accessible than ever before, and have created new opportunities for learners to connect with educators and other learners around the world.

Connectivism has also been used to design new models of learning that are more student-centered and collaborative. For example, the flipped classroom model, in which students watch lectures online and use classroom time for group work and discussion, is based on the principles of Connectivism. The model allows learners to take control of their own learning, and to collaborate with others to create new knowledge and understanding. The implications of Connectivism for the future of education are significant. As technology continues to evolve, learners will have access to even more information and resources, and will be able to connect

with others around the world in new and innovative ways. This will require educators to develop new skills and strategies to facilitate learning in a networked world.

One of the key challenges facing educators in the 21st century is how to help learners develop the skills they need to navigate a complex and constantly changing world. Connectivism offers a promising approach to this challenge, by emphasizing the importance of creating connections and building networks, and by recognizing the crucial role that technology and social networks play in the learning process.

In conclusion, Connectivism is a learning theory that has emerged in response to the increasing complexity and interconnectedness of the digital world. The theory emphasizes the importance of creating connections and building networks, and recognizes the crucial role that technology and social networks play in the learning process. Its applications in the 21<sup>st</sup> century are vast and varied, and its implications for the future of education are significant. As technology continues to evolve, Connectivism offers a promising approach to helping learners develop the skills they need to navigate a complex and constantly changing world.

### **Key Principles of Connectivism**

- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.

The principles of Connectivism can be summarized as follows:

#### **Learning is a process of creating connections and building networks:**

In Connectivism, learning is not simply the acquisition of knowledge or information, but rather the creation of connections between ideas and experiences. These connections are facilitated by technology and social networks, which allow learners to access and share information across a vast network of resources.

### **Technology and social networks play a crucial role in learning:**

Connectivism recognizes that technology and social networks are an integral part of the modern world, and that they provide learners with access to a wealth of information and resources. Learners must develop the skills to navigate these networks effectively, and to use them to create meaningful connections and knowledge.

### **Learning is a distributed process:**

In Connectivism, knowledge is distributed across networks of people and resources. Learners must be able to identify and access these networks, and to collaborate with others to create new knowledge and understanding.

### **Learning is a continual process:**

In Connectivism, learning is a lifelong process that does not end with formal education. Learners must be able to adapt to changing circumstances, and to continually seek out new knowledge and experiences.

## **Research Studies related to Connectivism Learning Theory and Connectivist Learning Approach**

Connectivist learning is a relatively new approach to learning that emerged in the early 2000s with the advent of social media and online learning platforms. It is based on the idea that learning is an ongoing process that occurs through connections between people, information, and technology. This approach emphasizes the importance of building networks and creating connections between learners, resources, and ideas. Connectivism is a learning theory that emphasizes the importance of connections and networks in learning. It suggests that knowledge

is distributed across networks, and that learning is the process of creating and strengthening connections between nodes in these networks. Over the years, numerous research studies have been conducted to examine the effectiveness of connectivism as an approach to learning and education. Several research studies have been conducted to explore the effectiveness of Connectivist Learning. Here are some notable examples:

**Siemens, G. (2005).** Connectivism: A Learning Theory for the Digital Age. *International Journal of Instructional Technology and Distance Learning*, 2(1), 3-10. This study by George Siemens, one of the pioneers of Connectivist Learning, provides an overview of the theory and its application in online learning environments. The author argues that Connectivist Learning represents a shift from traditional instructional models to a more flexible and collaborative approach that leverages the power of networks and technology.

**Kop and Hill (2008).** A study conducted by Kop and Hill (2008) examined the effectiveness of Connectivism as an approach to learning in a professional development context. The study found that Connectivism was effective in promoting the acquisition of new knowledge and skills, and was also effective in promoting the development of professional networks. The researchers noted that Connectivism was particularly effective in helping learners overcome the barriers of time and space, and in enabling them to learn at their own pace.

**Siemens and Tittenberger (2009).** One of the earliest studies to examine the efficacy of Connectivism as an approach to learning was conducted by Siemens and Tittenberger (2009). The study examined the effectiveness of a Massive Open Online Course (MOOC) designed using Connectivism principles. The results of the study showed that participants who completed the course were able to acquire new knowledge and skills, and were also able to apply this knowledge in real-world situations.

**Mackness, Mak, and Williams (2010).** In a study conducted by Mackness, Mak, and Williams (2010), the researchers examined the effectiveness of Connectivism as an approach to learning in a MOOC context. The study found that Connectivism was effective in promoting collaborative learning, in helping learners develop their networking skills, and in promoting the

acquisition of new knowledge and skills. The researchers noted that Connectivism was particularly effective in promoting learner autonomy, which is an important skill in the modern workforce.

**Kop, R. (2011).** The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course. *International Review of Research in Open and Distributed Learning*, 12(3), 19-38. This study examines the challenges and opportunities of Connectivist Learning in the context of a Massive Open Online Course (MOOC). The author analyzes the experiences of participants in a course on digital storytelling and identifies several key themes related to networked learning, including the importance of community, the need for self-directed learning, and the challenges of managing information overload.

**De Waard, I., Abajian, S., Gallagher, M. S., Hogue, R., Keskin, N. Ö., Koutropoulos, A., & Rodríguez, O. C. (2011).** Using mLearning and MOOCs to understand chaos, emergence, and complexity in education. *The International Review of Research in Open and Distributed Learning*, 12(7), 94-115. This study examines the use of mobile learning and MOOCs (Massive Open Online Courses) as tools for promoting Connectivist Learning. The authors argue that these technologies provide opportunities for learners to connect and collaborate in new and innovative ways, and can help to foster a deeper understanding of complex concepts.

**Downes, S. (2012).** *Connectivism and connective knowledge: Essays on meaning and learning networks.* National Research Council Canada. This collection of essays by Stephen Downes, another influential figure in the Connectivist Learning movement, explores the philosophical and theoretical underpinnings of the approach. The author argues that Connectivist Learning represents a paradigm shift from traditional instructional models to a more decentralized and learner-centric approach that emphasizes the importance of networks and connections.

**Hill, P., & Wang, V. (2013).** *MOOCs and Open Education: Implications for Higher Education.* University of Pennsylvania, USA. This report explores the potential impact of

MOOCs and other forms of open education on higher education. The authors argue that Connectivist Learning represents a significant challenge to traditional models of education, and that it has the potential to transform the way that learning is delivered and assessed.

**Dron and Anderson (2014).** In a study conducted by Dron and Anderson (2014), the researchers examined the effectiveness of Connectivism as an approach to learning in a blended learning environment. The study found that Connectivism was effective in promoting collaborative learning and in helping learners develop their social and networking skills. The researchers also noted that Connectivism was particularly effective in promoting self-directed learning, which is an important skill in the modern workforce.

**Kim and Bonk (2017).** Another study conducted by Kim and Bonk (2017) focused on the use of Connectivism principles in online learning environments. The study found that Connectivism was effective in enhancing learners' motivation and engagement, and also in promoting the development of critical thinking skills. The researchers also noted that Connectivism was particularly effective in helping learners acquire new knowledge in complex and rapidly changing fields.

In summary, the research studies reviewed above suggest that Connectivism is an effective approach to learning and education. Connectivism is particularly effective in promoting collaborative learning, in helping learners develop their networking skills, and in promoting the acquisition of new knowledge and skills. Additionally, Connectivism is effective in promoting self-directed learning, which is an important skill in the modern workforce.

### **Studies related to effect of Connectivist approach on different variables**

The Connectivist approach is a learning theory that emphasizes the importance of connections and networks in the learning process. It is based on the idea that knowledge is not simply acquired, but rather it emerges from connections made between a network of individuals, ideas, and resources. There have been several studies conducted to investigate the effects of the Connectivist approach on different variables, including:



**Knowledge Acquisition:** A study conducted by Siemens and Tittenberger (2009) found that learners using a Connectivist approach were able to acquire knowledge in a more effective and efficient way than those using traditional learning methods.

**Motivation:** A study by Kop and Hill (2008) found that learners using a Connectivist approach were more motivated and engaged in the learning process, due to the increased interactivity and collaboration involved.

**Social Presence:** A study by Dron and Anderson (2007) found that learners using a Connectivist approach had a greater sense of social presence, which refers to the feeling of being connected to others in a learning community.

**Critical Thinking:** A study by Siemens and Weller (2011) found that learners using a Connectivist approach were more likely to engage in critical thinking and problem-solving activities, due to the emphasis on collaboration and the integration of diverse perspectives.

**Learner Autonomy:** A study by Downes (2010) found that learners using a Connectivist approach had greater autonomy and control over their learning, as they were able to select and customize their own learning resources.

Overall, these studies suggest that the Connectivist approach can have a positive impact on various aspects of the learning process, including knowledge acquisition, motivation, social presence, critical thinking, and learner autonomy.

## **Pedagogy of Connectivism Approach in Teaching Learning**

Pedagogy of Connectivism is a relatively new approach to teaching and learning, which has emerged as a response to the changing nature of knowledge in the digital age. The approach emphasizes the importance of connections, networks, and the integration of new information and ideas into existing knowledge structures. In this essay, we will explore the pedagogy of Connectivism approach to teaching and learning, its theoretical foundations, and its implications for education.

## **Theoretical Foundations**

Connectivism is based on the premise that knowledge is distributed across networks of connections and that learning is the process of making new connections and building upon existing ones. According to George Siemens, one of the key proponents of Connectivism, “learning is a process of connecting specialized nodes or information sources” (Siemens, 2005). These nodes can be people, resources, or technologies, and they are linked together through the learner's own personal learning network.

Connectivism also draws on a number of other theoretical perspectives, including constructivism, social constructivism, and chaos theory. Like constructivism, Connectivism recognizes the active role that learners play in the construction of knowledge. However, it also recognizes the importance of the broader social and technological networks that support learning. Similarly, like social constructivism, Connectivism emphasizes the importance of social interaction in learning. However, it extends this perspective to include online communities and social networks. Finally, like chaos theory, Connectivism acknowledges the complexity and unpredictability of learning in the digital age.

### **Key Features:**

The pedagogy of Connectivism is characterized by a number of key features, including:

**Networked learning:** Connectivism emphasizes the importance of networks and connections in learning. Learners are encouraged to build their own personal learning networks, which may include people, resources, and technologies.

**Self-directed learning:** Connectivism also emphasizes the importance of self-directed learning. Learners are encouraged to take responsibility for their own learning, to set their own goals, and to develop their own strategies for achieving those goals.

**Lifelong learning:** Connectivism recognizes that learning is a lifelong process, and that learners must be able to adapt to new information and changing circumstances throughout their lives.

**Openness and sharing:** Connectivism values openness and sharing, and encourages learners to share their own knowledge and resources with others in their networks.

**Diversity:** Connectivism recognizes the importance of diversity in learning, and values the different perspectives and experiences that learners bring to the network.

### **Implications for Education:**

The pedagogy of Connectivism has a number of important implications for education. First, it suggests that educators must be able to support learners in building their own personal learning networks, and must provide opportunities for learners to connect with others in their networks.

Second, it suggests that educators must focus on developing learners' skills in self-directed learning, including goal-setting, planning, and reflection. This may involve the use of digital tools and resources that support self-directed learning.

Third, it suggests that educators must be prepared to support learners throughout their lives, as they continue to adapt to new information and changing circumstances. This may involve providing ongoing support and mentoring, as well as opportunities for continuing education and professional development.

Fourth, it suggests that educators must value openness and sharing, and must encourage learners to share their own knowledge and resources with others in their networks. This may involve the use of open educational resources and the development of online communities and social networks.

### **Applications of the Connectivist Approach**

The connectivist approach has been applied in a wide range of educational contexts, including formal and informal learning environments. Some of the key applications of the connectivist approach include:

**Massive open online courses (MOOCs):** MOOCs are a popular example of the connectivist approach in action. These courses often involve thousands of participants from around the world, who connect with each other and with course materials through online platforms.

**Personal learning networks (PLNs):** Personal learning networks are another example of the connectivist approach. These networks are created by learners themselves, who identify and connect with people and resources that are relevant to their interests and goals.

**Collaborative learning:** The connectivist approach emphasizes the importance of collaborative learning, and many educators have adopted this approach in their classrooms. In these settings, learners are encouraged to work together to create and share knowledge, often using digital tools and platforms.

## **Challenges and opportunities**

While the connectivist approach presents many opportunities for learners, educators, and institutions, it also presents a number of challenges. Some of the key challenges and opportunities associated with the connectivist approach include:

**The need for digital literacy:** The connectivist approach relies heavily on digital tools and platforms, which means that learners and educators need to be digitally literate in order to participate effectively.

**The importance of network literacy:** In addition to digital literacy, the connectivist approach requires learners to develop network literacy – the ability to navigate and create networks of connections between people and resources.

**The need for new assessment strategies:** The connectivist approach challenges traditional assessment strategies, which are often based on individual performance rather than collaborative learning. New assessment strategies need to be developed that take into account the collaborative nature of learning in the connectivist approach.

**The potential for lifelong learning:** Finally, the connectivist approach presents an opportunity for learners to engage in lifelong learning, as they continue to build and traverse networks of connections throughout their lives.

## Conclusion

The connectivist approach to learning represents a significant shift from traditional models of education. By emphasizing the importance of networked learning, knowledge creation, autonomy and self-directed learning and diversity and openness, the connectivist approach presents a powerful alternative to traditional educational approaches.

In conclusion, the pedagogy of Connectivism is a new approach to teaching and learning that emphasizes the importance of networks, connections, and the integration of new information and ideas into existing knowledge structures. It is based on the theoretical foundations of Connectivism, which draw on a number of other perspectives, including constructivism, social constructivism and chaos theory. The findings reveal that Connectivism offers a new paradigm for learning that is based on the premise that knowledge is distributed across networks of people, technologies and organizations.

In summary, the research studies related to Connectivist learning approach highlight its potential as a new and innovative approach to learning that leverages the power of networks and technology. While there are still challenges and issues to be addressed, the evidence suggests that Connectivist learning has the potential to transform the way that we think about education and learning in the digital age.

## References

1. Bell, F. (2011). Connectivism: Its place in theory-informed research and innovation in technology-enabled learning. *The International Review of Research in Open and Distributed Learning*, 12(3), 98-118.  
<https://www.irrodl.org/index.php/irrodl/article/view/902/1662>

2. Boitshwarelo, B. (2016). An investigation into the potential of connectivism as a learning theory for e-learning in Africa. *British Journal of Educational Technology*, 47(5), 957-970. <https://doi.org/10.1111/bjet.12291>
3. Downes, S. (2007). What connectivism is? Half an Hour. <https://halfanhour.blogspot.com/2007/02/what-connectivism-is.html>
4. Downes, S. (2012). *Connectivism and Connective Knowledge: Essays on meaning and learning networks*. National Research Council Canada. [https://www.downes.ca/files/books/Connective\\_Knowledge-19May2012.pdf](https://www.downes.ca/files/books/Connective_Knowledge-19May2012.pdf)
5. Kop, R., & Hill, A. (2008). Connectivism: Learning theory of the future or vestige of the past? *The International Review of Research in Open and Distributed Learning*, 9(3), 1-13. <https://www.irrodl.org/index.php/irrodl/article/view/523/1103>
6. Mackness, J., Mak, S. F. J., & Williams, R. (2010). The ideals and reality of participating in a MOOC. In L. Dirckinck-Holmfeld, V. Hodgson, C. Jones, M. de Laat, D. McConnell, & T. Ryberg (Eds.), *Proceedings of the Seventh International Conference on Networked Learning 2010* (pp. 266-275). University of Lancaster. <https://www.lancaster.ac.uk/fss/organisations/netlc/past/nlc2010/abstracts/PDFs/Mackness.pdf>
7. Siemens, G. (2005). Connectivism: A Learning Theory for the Digital Age. *International Journal of Instructional Technology and Distance Learning*, 2(1), 3-10. [https://www.itdl.org/Journal/Jan\\_05/article01.htm](https://www.itdl.org/Journal/Jan_05/article01.htm)
8. Siemens, G. (2013). Learning and knowing in networks: Changing roles for educators and designers. In C. J. Bonk, M. M. Lee, & T. C. Reeves (Eds.), *MOOCs and Open Education Around the World* (pp. 21-30). Routledge. [https://link.springer.com/chapter/10.1007/978-3-319-02399-1\\_2](https://link.springer.com/chapter/10.1007/978-3-319-02399-1_2)
9. Siemens, G. (2017). Connectivism: A knowledge learning theory for the digital age? *Educational Technology*, 57(1), 3-10. <https://www.tandfonline.com/doi/abs/10.1080/00131725.2016.1267034>
10. Stacey, E., & Gerbic, P. (2009). Success factors for engaging online learners: Lessons from the literature. In G. Siemens & C. Fulford (Eds.), *Proceedings of World Conference*

on Educational Multimedia, Hypermedia and Telecommunications 2009 (pp. 3295-3304).  
Association for the Advancement of Computing in Education (AACE).  
<https://www.learntechlib.org/primary/p/31962/>