The Role of Collaborative Learning and Problem-based Learning in Character Development: A Review

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Abstract

The purpose of higher education should focus on providing students opportunities to gain scientific knowledge of various disciplines and to improve skills, attitudes and right mindset that guide them to become successful professionals. Open and Distance Education provides flexible and open learning options for students to accomplish their educational goals. The use of diverse teaching-learning methods such as collaborative and problem-based learning may help students become 21st century learners who can apply their knowledge and skills to solve real world problems. The purpose of this review is to explore the role of collaborative and problem-based learning in Open and Distance Education in developing cognitive, social, emotional, decision making and problem-solving skills among learners. Particularly, it explores the benefits of both methods and how they help learners develop the kind of character necessary to succeed as professionals. A narrative review method was adopted in this study. The literature that examined how collaborative and problem-based learning affected the development of critical facets of learners' behaviour, including cognitive, emotional, social, motivational skills and personality was chosen for the review. Thematic analysis was used to analyze data and to identify the key themes in the data related to the two approaches. It is evident that both approaches increase opportunities to develop learners' cognitive, metacognitive, emotional, social and motivational skills necessary to succeed in their fields and maximize positive outcomes in social and professional settings. Accordingly, this will allow them to develop into mature professionals with well-rounded characters who can help communities grow.

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Introduction

Education is a key to future success, and it opens a variety of opportunities in one's life. The main purpose of education should be to build character. Hence, the purpose of higher education should focus on providing scientific knowledge and understanding of different disciplines, creating more opportunities for learners to improve skills and attitudes, and the developing right mindset that help them contribute to the development of the individual, community, nation and the whole world.

The purpose of higher education in the 21st Century

Education is viewed as the foundation of one's development. A person who wishes to pursue an undergraduate degree in any field of study should be able to integrate and apply knowledge they have learned throughout academic life for the development and well-being of others in society. Hence, the purpose of higher education is to provide the scientific knowledge and understanding as well as to create opportunities for learners to acquire skills, attitudes and the right mindset that will enable them to contribute to the development of individuals, communities and nations.

Learning is viewed as a lifelong process which begins from birth and continues until the end of life. Learning can take different forms. In addition, it has different effects on one's life. It may vary from time-to-time and from one stage of life to another (Singh, 2013). In educational contexts, learning can be viewed as an outcome that indicates a change in the learner. Further, it changes the way learners understand, experience or conceptualize the world around them. Hence, learning can be characterized as both an external (something that results from an experience)

and internal process (something an individual does to understand the world) (Nagel & Scholes, 2016).

Rapid changes in socio-cultural structure, economy, industry and technology in societies and in the world due to new global challenges have placed a greater demand on higher educational institutions to train high quality professionals who can provide the services for individuals who experience various challenges to overcome their issues and to enhance their overall well-being. Hence, the main objective of higher education in the 21st century should focus on developing prepared minds; preparing learners with knowledge and perspectives that can be utilized to comprehend and explain individual, societal and global challenges and to recommend appropriate strategies and interventions to address such concerns. In order to achieve this, learners should be able to process and integrate existing knowledge to create new knowledge that can be applied to address ongoing and emerging societal, regional and global challenges. In this effort, the higher educational institutions should expand opportunities for learners with more choice and control over the learning materials and instructional methods and introduce teaching-learning activities that provide learners opportunities to develop a broader understanding and perspectives, to gain insight and to look far beyond the present.

Open and Distance Education

Open and Distance Education, a non-traditional approach to teaching and learning which provides any person, anywhere, at any time, with flexible and open learning options to achieve their academic goals, has significantly influenced educational delivery methods (Bradley & Yates, 2000;

Maxwell, 1995). It has greatly expanded the opportunities for students to engage in educational activities without being constrained by time, place and stringent programme entry requirements (Sivalogathasan, 2019). The concept of Open and Distance Learning was introduced to offer flexible learning opportunities for learners, particularly when both learners and instructors were not able to physically meet with each other in teaching and learning activities (Ghosh et al., 2012).

Open Learning and Distance Education are identified as two different concepts. Distance Education is a mode of educational delivery for students who may not regularly be present physically in an educational setting to gain knowledge. Distance learning differs from traditional computer-based learning. Open Learning, on the other hand, focuses on expanding opportunities for students with more choice and control as possible over the course material and instructional methods (Maxwell, 1995).

Open and Distance Learning together creates more opportunities, particularly for individuals who do not have access to traditional educational institutions, to achieve their educational goals and obtain educational qualifications through the alternative teaching-learning activities (Rahila & Babe, 2016, as cited in Sarkar et al., 2024). Distance learning has developed increasingly faster and become more common as a result of the widespread availability and accessibility of computer technology (Kumar, 2016, as cited in Sarkar et al., 2024). Hence, Distance Education provides alternative and flexible learning opportunities for individuals of all ages to achieve their academic goals (Sudalai, 2016, as cited in Sarkar et al., 2024).

Modern technology has enormously impacted various aspects of individuals' lives in the new millennium. The technology revolution presents various challenges, especially for educators to re-evaluate their core beliefs and search for innovative methods to incorporate technology in a creative way in teaching-learning activities (Behera, 2013). Online learning has the potential to give many benefits for various groups including students, instructors, administrators and service providers (Thanji & Vasantha, 2018). Given the growing significance of online educational programmes, it is important to understand both the advantages and limitations identified by learners and to focus on the areas that require improvement for the online teaching and learning activities to become fruitful (Sarkar et al, 2024; Thanji & Vasantha, 2018).

The use of different teaching-learning modalities that create more opportunities for learners to gain knowledge and understanding and to improve their skills, attitudes and mindset will benefit them in both personal and professional development, particularly in Open and Distance Learning. In this effort, collaborative learning and problem-based learning can be identified as effective learning strategies that can be used to prepare students to become the 21st-century learners who can apply their knowledge and perspectives, and use skills, attitudes and mindset to address real-world problems as well as to find better solutions collaboratively.

The student body in Open Universities is different compared to other conventional universities. This diverse community ranges from school leavers to adult learners who represent different cohorts and have experienced various sociocultural, historical and contextual influences in life. Using teaching-learning activities that create opportunities for learners to interact with more

experienced and skilled individuals within their student community and to share their knowledge and experience, will motivate young learners to create new knowledge, develop broader perspectives, improve cognitive, emotional, motivational, personality and social skills, and look far beyond the present in finding solutions for ongoing and emerging challenges in the real world. In this endeavour, the selection of more appropriate teaching and learning strategies such as collaborative learning and problem-based learning, particularly in Open and Distance Learning, is significantly important for learners to achieve the expected outcomes.

Collaborative learning in teaching-learning activities in Open and Distance Education

In collaborative learning, learners with different perspectives and abilities have the opportunity to work together and to interact on both the similar and different characteristics of a given task to accomplish a shared learning outcomes (Dewi et al., 2021; Hadwin et al., 2018; Strijbos, 2016; Warsah et al., 2021). Collaborative learning helps them develop various skills such as cognitive, socio-emotional, motivational and interpersonal skills that are important for their development. In this learning method, students have the opportunity to understand different perspectives, to work collaboratively (Dewi et al., 2021; Hadwin et al., 2018; Warsah et al., 2021).

In the process of collaborative learning, students feel more comfortable in generating ideas. It encourages students to interact among themselves by sharing their knowledge to gain a better understanding, mutually dependent on constructing a shared task and to find better solutions for problems (Azar et al., 2021; Koretsky et al., 2021; Linder & Hayes, 2018; Warsah et al., 2021). In addition, when students collaborate to complete a given task, it becomes more interesting and

meaningful (Azar et al., 2021). The collaborative learning experience helps them gain a deeper understanding of their course materials (McHugh et al., 2020) and provides greater educational benefits, particularly for students who are behind in their studies to improve their academic performance with the support of group members (Warsah et al., 2021). Hence, collaborative learning can be identified as an appropriate and more effective method to train students to become the 21st-century learners who are able to apply their knowledge and skills to solve a problem, complete a given task or create an invention (Azar et al., 2021).

Problem-based learning in teaching-learning activities in Open and Distance Education

Problem-based learning intends to present the reality of the world (Pawson et. al., 2006). It helps learners develop various skills such as cognitive skills, problem solving skills, socio-emotional skills, teamwork, motivation, etc. (Grabinger et al., 1997; Norman & Schmidt, 1992). It was developed in order to accomplish several learning outcomes including, helping students to create an extensive and flexible knowledge base, improve effective problem-solving skills, become effective teammates, become intrinsically motivated to learn and enhance self-directed learning skills (Barrows, 1985, 1986; Norman & Schmidt, 1992).

Problem-based learning requires skills such as critical thinking, questioning and reflection (Barrows & Kelson, 1995). Additionally, it encourages students to actively engage in the learning process (Grabinger et al., 1997) and offers opportunities for them to replicate the processes to address the real-world problems (Dunlap, 2005). Problem-based learning motivates the creation of knowledge rather than the transmission of knowledge. Hence, it blends with the Constructivist

paradigm of learning (Jonassen, 1991). It has the potential to influence the development of a rich environment for active learning (Dunlap, 1996). Also, problem-based learning may contribute to the development of self-management, autonomy and personality.

Problem-based learning challenges the traditional teacher-centered, knowledge-transfer paradigm of teaching and learning. Further, it encourages instructors to explore alternative methods of assessment (Pretorius, 2010). In Open and Distance Learning, problem-based learning presents distinct challenges where learners and instructors are separated not only by time and space (Wang et al., 2008) but also by the number of delivery modes compared to traditional on-campus learning environment (Dibiase, 2000).

Aim and Objectives

The main aim of this review is to explore the role of collaborative learning and problem-based learning in Open and Distance Education in developing cognitive, social, emotional, motivational skills and decision-making and problem-solving skills among learners. Particularly, it focuses on identifying the benefits of collaborative learning in improving these skills. Additionally, it seeks to explore the advantages of problem-based learning in enhancing these skills among learners. Finally, it intends to explore how collaborative learning as well as problem-based learning help learners develop the kind of character necessary to succeed as professionals.

Methodology

A narrative review method was adopted in this study. The review was limited to journal articles that are related to collaborative learning and problem-based learning, and Open and Distance Learning published in the period 2000 -2024. The main search for this review was conducted using electronic databases, and Google Scholar. The literature that focused on effects of collaborative learning and problem-based learning on developing important aspects of individuals' behaviour including cognitive, social, emotional, motivational skills and personality were selected for the review, and the thematic analysis method was used for the data analysis and to identify the key themes emerged related to the two approaches. The significance of collaborative learning as well as problem-based learning, particularly in the Open and Distance Learning context are discussed in relation to the development of learners' cognitive, metacognitive, social, emotional, motivational, decision making and problem-solving skills, and their character.

Results and Discussion

Benefits of collaborative learning in developing skills and character

Developing cognitive skills

Collaborative learning helps students improve their behaviour in relation to the main domains of human behaviour namely, cognition, emotion, motivation, personality and social interaction. It provides opportunities for students to improve their cognitive skills such as thinking and learning, conceptual understanding, critical thinking, logical argument, decision making and creativity, higher-order metacognitive and problem-solving skills. Collaborative learning has an effect on the students' cognitive learning processes (Warsah et al., 2021). It creates the environments for

students to engage in thinking and learning collaboratively and helps students improve conceptual understanding (Lyons et al., 2021).

Collaborative learning has positive effects on improving critical thinking skills in students (Han & Ellis, 2021; Kurniasih, et al., 2016). Critical thinking can be described as one's ability to question, evaluate, interpret, reflect, reason and make informed judgments and decisions (Warsah et al., 2021). Critical thinking process involves using one's knowledge, judgments and reflective experiences (Howard et al., 2015). In the collaborative learning process, students engage in logical argument and negotiation (Han & Ellis, 2021; Linder & Hayes, 2018). Critical thinking skills are essential in finding appropriate solutions for real world problems.

Developing metacognitive skills

Collaborative learning facilitates students developing metacognitive skills. Metacognition can be described as one's ability to develop awareness of the learning process and take responsibility of applying appropriate methods to manage the learning process (Garrison, 2022). Prior research has suggested that self-regulation is related to metacognition (De Backer et al., 2022; Garrison, 2022). Self-regulated learning, one's ability to comprehend and control his or her goal setting, self-monitoring, self-instruction and self-reinforcement are crucial particularly, in the context of online learning (De Backer et al., 2022). According to Garrison (2022), shared metacognition is an understanding of one's learning in the processes of creating meaning and developing understanding related to self with others. In collaborative learning, it is important to initiate regulation methods by different group members who collaboratively participate in monitoring

and regulating the learning process of the group at the cognitive, contextual, motivational and behavioural level (De Backer et al., 2022; Zhao & Ye, 2020). This is known as socially shared regulation (Hadwin et al., 2018).

Developing decision making and problem-solving skills

In addition, collaborative learning assists students to develop other cognitive skills such as decision-making and problem-solving skills. When the students have the opportunity to collaborate, they use their reasoning and metacognitive skills and work together to solve problems during the learning process (Warsah et al., 2021). Further, in collaborative learning, students improve creative problem-solving skills (Lyon et al., 2021). These skills promote positive attitudes among students and their motivation in learning, enhanced student participation and deeper learning, and thereby improving their academic performance (Han & Ellis, 2021).

Developing social skills

Collaborative learning has an effect on social and emotional functions of learners. The main feature of collaborative learning is the learners' connectedness that motivates understanding and innovative thinking through critical discourse (Busch et al., 2021; Warsah et al., 2021). Collaborative learning provides opportunities for learners to improve their social skills because of mutual engagement (Azar et al., 2021). It guides them to improve active participation, socialization and skill development (Lyon et al., 2021). Further, it encourages learners to be more responsible for learning and strengthen them by motivating them to learn, developing their positive mindsets towards learning, enhancing their awareness to learning and motivating them

to learn without any interruptions. Consequently, students' learning outcomes are improved, and their academic achievements are increased (Han & Ellis, 2021; Lyon et al., 2021; Warsah et al., 2021).

Moreover, collaborative learning provides opportunities for peer interactions and active participation in the learning process. Active learning occurs when learners are actively involved in knowledge construction compared to passively receiving knowledge given by the instructor. An active interaction among learners is important to enhance the process of knowledge creation for an individual learner. In the process of collaborative learning, students actively interact through questioning, discussing, debating, explaining to each other and actively engaging in creating new knowledge *(*Sumadyo et al., 2021). As a result, learners develop and improve important interpersonal and communication skills that help students transition into their professions and to develop their professional life (Lu & Smiles, 2022).

Developing emotional skills

When learners work together to complete their academic activities, it becomes more interesting and meaningful (Azar et al., 2021). Collaborative learning provides an opportunity for them to share their views, thoughts and feelings. A positive emotional environment within the group can enable learners to collaborate to make more effort in learning and to focus more on performing their tasks (Järvela et al., 2016; 2021). Social-emotional interactions developed in collaborative learning can influence not only the learners' cognitive processes but their satisfaction and positive learning outcomes (Huang & Lajoie, 2023). Also, Collaborative learning promotes emotional

intelligence by improving their emotion regulation, understanding others' emotional state and learning to select appropriate responses to others' emotionality. Hence, these skills will benefit their emotional well-being and personality development.

In the collaborative learning process, students tend to engage in both cognitive interactions and socioemotional interactions. Cognitive interactions can be defined as the circumstance that students are actively engaged in the processes of thinking, reasoning analyzing and elaborating to deepen their understanding of the materials they learned (Isohätälä et al., 2020). Socioemotional interactions, on the other hand, serve as a source of motivations for learners in the group and support them to be connected with one another, be compassionate and sense the spirit of their collaborations with each other (Isohätälä et al., 2020; Järvenoja et al, 2020). Subsequently, these interactions affect one another and the overall performance of the group (Isohätälä et al., 2020; McHugh et al., 2020).

Personality development

Collaborative learning provides opportunities for students to learn the value of each individual contribution to the group tasks (Han & Ellis, 2021; Linder & Hayes, 2018). Each individual has a unique personality which is shaped by genetics, social environment and their personal experiences. When students with different personalities collaborate to accomplish a given task, each individual may use his or her capabilities and unique personality characteristics or traits to get the best outcome. It provides greater educational benefits particularly, for students who are behind in their studies to improve their performance with the support of the group (Warsah et

al., 2021) and to improve the learners' social skills because of mutual engagement (Azar et al., 2021). Also, it enables them to learn from each other and understand human qualities that are important in developing their character.

Benefits of problem-based learning in developing skills and character

Developing cognitive skills

Problem-based learning in a group creates an environment for learners to activate past knowledge they acquired, facilitate their ability to explain and improve their retention. Also, students who are engaged in problem-based learning are more likely to remember more of what they learned compared to others (Loyens, 2011). This suggests that they are better able to organize what they learned. Further, students who are engaged in problem-based learning significantly improve their critical thinking skills such as analytical ability, keenness and comprehensive interpretation and evaluation, compared to those who followed lecture-based learning (Şendag & Odabaşi, 2009; Tiwari, et al., 2006). Compared to other teaching-learning activities, problem-based learning seems to be an effective method to gain positive outcomes for improving clinical knowledge and skills. Research has revealed that, compared to the students who follow traditional learning method, students who engage in problem-based learning perform better (Gijbels et al., 2005).

Developing student motivation

A problem-based environment, compared to traditional lecture-based education, influences motivation of the learner. Research finds that there are some students' motivational and cognitive

characteristics that influence problem-based learning experience (Araz & Sungur, 2007). Accordingly, in problem-based learning, students are intrinsically motivated to engage in learning (Loyens, 2011). In problem-based learning, students have the opportunity to integrate their knowledge when they apply it to real-world situations. It is evident that they tend to value their ability to integrate knowledge that they gain with their practice (Coleman, Collins, & Baylis, 2007; Smith & Coleman, 2008). Research has further suggested that students tend to value the responsibility that problem-based learning requires, and are more intrinsically motivated to learn (White, 2007).

Developing social skills

Changes in problem-based learning in the 21st century with the use of technology have provided more opportunities for students to improve their skills. For example, a blended problem-based learning environment with a virtual learning environment connected with face-to-face tutorial meetings, has helped students improve their communication among team members. The students have reported that they preferred a blended problem-based learning environment over a regular problem-based learning environment (Woltering et al., 2009). In addition, students reported that they are more satisfied with the opportunity given for formal and informal interactions with their instructors and formal interactions with their peers in problem-based learning. Further, in problem-based learning, students gain a better understanding on how to become good collaborators to learn to engage in open discussion, come to an agreement about their solutions and other issues and resolve contradictions in their findings by collaboratively working in a group (Hmelo-Silver, 2004). Prior research has also revealed that undergraduates

who engaged in problem-based learning reported that they improved their communication skills (Cohen-Schotanus, et al., 2008; Schmidt et al., 2009) and interpersonal skills (Schmidt, et al., 2006). Accordingly, blended problem-based learning facilitates students to improve their social skills such as mutual engagement, social interactions and communication skills.

Personality development

The student plays the main role in problem-based learning. In this process, the student initiates the learning. Hence, problem-based learning becomes self-directed learning. The problem-based learning environment, therefore, provides an opportunity for learners to develop autonomy (Loyens et al., 2008). In problem-based learning, students take responsibility for their own learning. They tend to be open-minded, take decisions and create innovative solutions. Previous research has suggested that students who are more advanced tend to desire more learning, more self-management and more self-control compared to other students (Kocaman et al., 2009). Accordingly, problem-based learning contributes to their personality development.

Conclusions

It is evident that both collaborative learning and problem-based learning have beneficial effects not only on student learning outcomes but their character development. According to prior research evidence, collaborative learning allows students improve their cognitive, metacogntive, socio-emotional, motivational skills, decision making and problem-solving skills and personality. Problem-based learning also contributes to the development of cognitive, motivational and social skills, and personality. Accordingly, both learning methods expand opportunities for learners to

improve their cognitive, metacognitive, emotional, social and motivational skills that help them function effectively in their relevant fields and to optimize positive outcomes in social, professional and work environments. Finally, it will enable them to become mature professionals with well-rounded characters who can contribute to the development of individuals and community.

Recommendations

Higher education in the 21st century aims to develop prepared minds; equip students who can apply their knowledge and understanding to address individual, societal and global issues and to recommend appropriate strategies and interventions to overcome them. It is evident that both collaborative learning and problem-based learning in Open and Distance Education help learners develop various skills that contribute to their character development. Therefore, it is important to expand opportunities to use more effective teaching-learning methods such as collaborative learning and problem-based learning, particularly in Open and Distance Learning to train students to become 21st century learners and to develop their personality to become successful professionals in their own fields of expertise. It will enable them to be equipped with knowledge, skills, attitudes and the right mindset to find appropriate solutions for real world problems and to develop with well-rounded characters who can serve for the betterment of individuals and communities.

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