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Collaborative Problem-based Learning: Adaptation of Vygotsky Sociocultural Learning Theory

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Abstract: Adapation of Vygotsky's Sociocultural Learning Theory (SLT) concepts in collaborative problem-based learning are viewed theoretically for synchronicity and richness of feedback highlighting in the collaborative learning system. This study is focusing on workplace problem-based learning and how the selected aspects of collaborative learning system can influence workplace soft-skills performance among graduates and experienced employees.

Keywords: Vygotsky, collaborative learning, problem-based learning, collaborative problem-based learning supported with technology

Introduction

Some authors have noted that certain soft- skill such as problem solving, interpersonal interaction, communication and teamwork were preferred by employers when hiring graduates [1]. However other research has indicated that recent graduates are often lacking in problem solving skill, and face difficulties handling work pressure, making decisions or communicating in the workplace.

Interpersonal interaction and collaboration can create positive experiences and affect cognitive and personal participation positively during discussions. Interactional and collaborative learning approaches are consistent with Vygotsky's Sociocultural Learning Theory (SLT).

Information technology can play a significant and essential role within the collaborative environment. Learning systems are capable of integrating collaboration with technology. Synchronicity and richness of feedback highlighting in collaborative learning system influences learners understanding and affect the individuals' cognitive and social participation [9].

The aim of this study is to determine the effectiveness of selected aspects of collaborative learning systems on the facilitation of the workplace problem solving performance among graduates and experienced employees, within Vygotskian learning framework. Specifically, it examines whether synchronicity and richness of feedback highlighting formats results in great skill-learning and performance within collaborative environments.

1. Vygotsky Sociocultural Learning Theory – The Concepts

According to Vygotsky [7], knowledge is acquired through the cognitive construction of conceptual scaffolds within supportive environments, called Zones of Proximal Development (ZPD). ZPD is a gap between a learner's current development to the learner's potential development. Within each ZPD, individuals can learn from teacher/adult, knowledgeable peer or from external tools such as technological agents, books or learning aids; called scaffolding. Scaffolding can be referred as assistance for learner's to achieve potential development from the learner's current development [8]. Scaffolds within supportive environments will gradually enhanced cognitive development. Social interactions between individuals enhances this learning and collaborative activities provide individuals with the opportunity to experience achievement satisfaction, mastery over factual information to encounter and greater success in problem solving compared to individualistic learning [2].

2. Adapation of Vygotskian to Collaborative Problem-based Learning

Vygotsky's SLT is theoretically significant with collaborative problem-based learning supported with technology. Social interaction during collaboration within supportive environment and reflective activity during collaborative problem-based learning are influences from Vygotsky's SLT.

2.1 Synchronicity and Richness of Feedback Highlighting in Collaborative Learning

Collaborative learning can be defined separately based on the definition of learning and collaboration. Learning can be described as process of acquiring knowledge of facts, skills and methods that can be stored or reproduced when necessary. Dillenbourg [8] interpreted collaboration as situations when more than one person work together, performing the same actions and have a common goal. Students participated in active learning of acquiring knowledge, working together to maximize their own on each other learning during collaboration. Social interaction and collaboration between peer within supportive environments positively influences the cognitive growth to the learners, thus increase learners' motivation and arousal [3].

Learning systems are capable of integrating collaboration with technology. Some authors described computer technology is able to mediate the interactions between participants in collaborative learning [3, 4]. Communication synchronicity during interactions does affect the performance in learning environments. Two types of synchronicity identified from various studies: synchronous (real-time activity) and asynchronous (flexible time activity).

Reflective action during collaboration will influence the understanding of learning for individuals or group. Richness of highlighted feedbacks during collaboration using discussion board or chat allows learners to view their feedbacks, interaction and discussions in text-based format and create awareness to the learners. It will ease the learner's to view and search the feedbacks for further discussions. Feedbacks can be highlighted in visual/iconic formats/high rich or by phrase-tagging/low rich [10, 3].

2.2 Problem-based Learning supported with technology

Problem-based learning (PBL) was introduced and implemented at MacMaster medical school in 1969 by Howard S. Barrows. PBL is a learning that results from working towards understanding of a problem and the problem must be encounter first in the learning process [5], and as a learning approach in seeking solutions for given complex situations or

scenarios. PBL stimulates learners learning from the cognitive conflicts during problem solving, learning interactions, social negotiation and evaluation within social interaction, constructed by the learners' prior knowledge or with knowledgeable partner and reflective activity [6].

In collaborative learning environment, learners work together based on given workplace problem by the system. Learners for each group will participate in problem-based learning process to generate solutions for workplace problems. Each group will use different levels of synchronicity for interaction and different richness of feedback highlighting formats for reflective actions during communication in collaborative learning. Solutions generated from the collaborative problem-based learning process hypothetically influence workplace soft-skills performance among selected learners.

Social interaction and collaboration mediated with computer technology in problem based learning are consistent with concepts of scaffolds and Zone of Proximal Development in Vygotsky's Sociocultural Learning Theory (SLT). Reflective action in learning significant with collaborative and problem-based learning thus influences learning achievement for participants [6].

3. Future Works

Collaborative learning prototype with problem scenarios related to workplace environments will be developed and implemented to selected participants. Solutions generated in discussions during collaborative learning will be analysed to measure their quality and effectiveness towards workplace soft-skills performance.

4. Conclusion

Workplace soft-skills are one of the key to achieve successful working life. Collaborative problem-based learning within supportive environment hypothetically influences learners in problem solving specifically for problems in the workplace. Hopefully, solutions generated from collaborative learning system prototype will contribute to workplace soft-skills performance among graduates and experienced employees.

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