Dialogic Framework for Creative and Collaborative Problem-solving

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Abstract: This work introduces a pedagogical dialogic framework that nourishes creativity during collaborative problem solving. The framework embraces six creative dimensions that allow students´ voices to enter in and inter-animate each other in a way which new possibilities emerge. Students are aware with a bigger range of possibilities in a discussion and are able to go deeper into an argument to explore its assumptions and implications.

Introduction

Collaborative and creative problem-solving skills involve more than just following a procedure or the application of a model. It is a complex enterprise that may introduce a considerable amount of uncertainty to students. It's accompanied by associated thinking strategies and requires flexibility. Engaging in collaborative and creative problem-solving is particularly difficult for students. The lack of meta-cognitive knowledge hinders their ability to creatively and collaboratively solve problems. Students rarely build a knowledge base that is sufficiently robust because they underestimate the complexity of new knowledge and generate excessively vague relationships between prior knowledge and new knowledge. External guidance is necessary to remind students to pay attention to specific processes while solving problems. Teaching thinking strategies is of prime importance to boost collaborative and creative problem-solving skills. Wegerif (2010) proposes a dialogic theory of thinking and teaching thinking and creativity, which starts from the metaphor of thinking as dialog. For dialogic theory, learning to think means being pulled out of oneself to take the perspectives of other people and through that engagement in a play of perspectives, to be able to creatively generate new perspectives or ways of seeing and thinking the world (Wegerif, 2010). The dialogic space is a space of ideas that allows students to reflect on ideas and see them from lots of other students´ points of view at once. To overcome students´ obstacles during collaborative and creative problem solving, we propose a dialogic framework to designing for creative collaborative learning with particular emphasis on distinct ways to explore the dialogic space.

Dialogic Framework for Teaching Thinking Strategies for Creative and Collaborative Problem-solving

Wegerif (2010) proposes a scaffolding approach to teaching thinking as opening, widening and deepening dialogic space. When the teacher promotes the opening of a dialogic space allows many voices to enter in and inter-animate each other in a way which creatively opens up new possibilities. Students are engaged in a widen dialog space when they are better acquainted with the range of positions that are possible and they deepen a debate when they are able to go deeper into a single bit of the argument to explore its assumptions and implications.

Considering as a starting point Wegerif´s educational dialogic theory, we develop in this work a pedagogical dialogic framework that embraces six dimensions that allow a dialogic space exploration, widening and deepening it. These dimensions are: immersing, unpacking opportunities, overcoming boundaries, expanding, discovering unpredictable places, and developing.

Immersing in Dialogic Space

This dimension concerns with the enhancement of the analogical and metaphorical thinking. Analogical reasoning is one of the most important problem-solving heuristics. It is related to the transfer of solutions from previously known problems to novel ones and the ability to abstract similarities and apply previous productive experiences to new situations. Analogies and metaphors move students into the unknown. The function of metaphors is to describe a reality outside of reality itself. Metaphors convey attention to something different in order to be able to understand how something was given. Analogies and metaphors transfer us from an old meaning to a new one allowing a different understanding. This dimension is also concerned with the search for information. To be successful at discovery and innovation students should be aware of previous and related work and should be aware of principles and techniques to be applied in the development of their work. The more diverse your knowledge, the more interesting the interconnections. Students widen the dialogic space while jointly search information having an objective in mind and search information for inspiration, detect relevant and irrelevant information, recognize familiar information and cope with new information, reapply techniques and adapt techniques, experience having an open mind and experience having an objective, state goals and brainstorm, adapt hypothesis and make conjectures, explore similarities and differences of a metaphor, and

explore similarities and differences of an analogy.

Unpacking Dialogic Space Opportunities

Students unpack opportunities collaboratively looking for attributes and relationships among concepts and new ideas, and try to organize the information, deepening the dialogic space. They recognize dependence and independence relations, necessary and sufficient conditions, causes and effects, similarities and differences, correspondences and oppositions, class inclusion and exclusion, associations and dissociations, hierarchy ascendant and descendant relations, order and disorder, generalities and specificities, abstract and concrete features, potential and non-potential uses/functions, and examples and counter-examples. This dimension involves the improvement of the ability to explicit what is already there but hidden. It encompasses interplay between abstract and concrete ideas, where example, artifacts or concrete ideas are used to refine abstract ideas. This dimension is also related to the divergent thinking ability elaboration. Elaboration is an important component of the creative process and consists of the who, what, why, and how elements of solution ideas.

Overcoming Dialogic Space Boundaries

Students widen the dialogic space while jointly overcome the dialogic space boundaries situating the ideas in a bigger context, performing contextual shifting. They jointly search for relationships with "neighbor" ideas outside a given context, scope and limitations, and constraints. They perform critical transitions and constraint relaxation to identify key places in the dialogic space where good and bad ideas can be better developed. This dimension is related to an attempt to overcome it and visualize concepts and ideas in an open minded way. Seeing an idea in different contexts and also seeing ideas in a bigger scenario is a way to overcome conceptual barriers. Considering ideas in new contexts is a way of gaining insight about other possible uses and meanings.

Expanding the Dialogic Space

The students widen the dialogic space making together re-combinations and combinations of similar or distinct concepts and ideas, building on other´s ideas, and re-thinking their previous ideas. The students also try to make combinations of possible disparate or unconnected ideas by means of a dialectical synthesis or encapsulating the entire dimension of a new concept. They derive new knowledge on the basis of a lack of similarity between two or more past constructs or elements from domains which are far apart. This dimension entangles constructive interactions among students related to innovative construction of a complex system of ideas. The main premise in this dimension is that unexpected, new arrangements, and other´s interpretations triggers new interpretations and ideas. Previous opinions and concepts are co-constructed and students´ understandings expanded. Students integrate answers from many places in diverse ways, in a process of transcending and exchanging different perspectives and constructing new ideas.

Discovering Unpredictable Places in the Dialogic Space

This dimension capitalizes on often way in which bad ideas become beneficial detours to good ideas. We are considering failure as a key aspect of creativity and thinking of failure as a new opportunity, as a way to forward with it. The exploration of good ideas allows a local exploration of the dialogic space, which leaves unexplored large areas of this space. The exploration of bad ideas pulls the students to new unpredictable places, facilitating a movement to far away areas, which thus overcome the drawbacks of the limited exploration of that good ideas entail. Students widen the dialogic space when turn ideas and concepts in new interpretations, also thinking about misconceptions.

Developing the Dialogic Space

This dimension encompasses the evaluation, critics, and bringing together of ideas. By means of evaluations of ideas students are able to carry out decision making processes based on criteria application and improve ideas considering its bad features. One important aspect of this dimension is that when students evaluate and critique different perspectives and ideas they must be confronted with uncertainty and conceptual conflict. Both are states of disequilibrium that activate a process of conflict resolution and a quest for certainty. Students deepen and widen the dialog space evaluating, comparing, selecting concepts and ideas, considering different alternatives, pointing positive and negative outcomes based in criteria application, starting a search for a more adequate cognitive perspective and reasoning process aiming to resolve conflict and uncertainty.

References

Wegerif, R. (2010). The Role of Dialog in Teaching Thinking in Technology. C.Howe & K. Littleton. (Eds.) *Dialogue and Development.* Routledge, 338-357.