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Marcia*, a third year early childhood student, was undertaking her teaching practice in a Kindergarten classroom. At the Faculty of Education reflection day Marcia approached me in tears. The reflection day is held half way though the practicum in order to give students an opportunity to share their classroom experiences with peers and lecturers. She was not happy with her supervising teacher, Annette, who would not allow her to scaffold the pupils reading comprehension in her classroom. Annette demanded of Marcia that books be read to the children without comments or questions. The teacher's concern was that Marcia would impose her own understanding of the story on her students which might suppress their spontaneity and freedom in interpreting the text and take away their ability to think for themselves. Mostly, Annette was concerned with Marcia's questions on "story prediction". She didn't think that asking specific questions such as, "Do you think the Duck will come back?" was appropriate. To support her claim, Annette, an educator of the older generation, referred to the theory of Piaget which she studied in her undergraduate degree. Marcia was very disappointed with her supervising teacher, as she believed in scaffolding as one of the most advanced teaching technique to date. She also felt that to her, scaffolding was a natural way of sharing reading with young children. As an educator, she felt somewhat constrained and restricted by not being able to talk to children and ask questions while reading to them

[*]Pseudonyms have been used for the students and teachers mentioned in this paper.

Abstract

As the focus of Australian educational research has shifted to studying the quality of teacher intervention, the notion of scaffolding is becoming increasingly popular among educators in different areas such as literacy and numeracy, early childhood education and educational psychology for adults. Vygotskian socio-cultural psychology, and the zone of proximal development (ZPD) in particular, is commonly referred to as the theoretical underpinnings of scaffolding. However, the interpretation of the term and its implementation varies significantly from study to study. An oversimplified approach to scaffolding can lead to its interpretation as direct instruction which is a concern. This paper examines the ways that scaffolding has been interpreted, defined and implemented in educational research. The definitions and explanations of scaffolding in modern texts on educational psychology for pre-service teachers are also reviewed. The ways that different aspects of the concept of the zone of proximal development have been reflected and utilised are analysed.

Introduction

Over the past two decades, an increasing number of educators and researchers have used the concept of scaffolding as a metaphor to describe and explain the role of adults or more knowledgeable peers in guiding children's learning and development (Stone, 1998; Wells, 1999; Hammond, 2002; Daniels, 2001).

The popularity of the scaffolding metaphor indicates its conceptual significance and practical value for teaching and educational research. Educators find the metaphor appealing as it "resonates with their own intuitive conceptions of what it means to intervene successfully in

students learning" and "offers what is lacking in much literature on education - an effective conceptual metaphor for the quality of teacher intervention in learning" (Mercer, 1994, in Hammond, 2002, p.2).

For a new generation of educators, such as Marcia in the example above, the metaphor of scaffolding provides a theoretical justification for their teaching strategies in the classroom. However, due to the metaphorical nature of the term, scaffolding does not provide educators with clear and definite guidelines on exactly how it should be used to achieve successful teaching. For example, in the case of Marcia, was the question, "Do you think the Duck will come back?" a good question to ask or should it have been put in a more generic way, such as "What do you think will happen next?" To answer such questions, the conceptual basis of scaffolding needs to be analysed.

Since it was introduced by Wood, Bruner and Ross (1976), the term scaffolding has been interpreted and applied to educational research and practice in a variety of ways. While accepting that notionally the zone of proximal development (Vygotsky, 1962, 1978) is at the heart of scaffolding, the ways that the ZPD concept underpins the theoretical conceptualisation of scaffolding have been seen differently. In addition, the concept of the zone of proximal development itself has been interpreted and analysed in different ways due to initial vagueness and ambiguity in its definition (Miller, 1993). In the following sections of this paper different interpretations of scaffolding, the zone of proximal development and the relationship between the two will be examined.

Understanding the Relationship between Scaffolding and the Zone of Proximal development

There is a consensus that Vygotskian socio-cultural psychology and the notion of the zone of proximal development are at the heart of the concept of scaffolding (Berk, 2001; Daniels, 2001; Wells, 2001; Krause et al, 2003; McDevitt & Ormrod, 2002). However, the interpretations and explanations of the exact ways that scaffolding relates to it have been different. These range from understanding scaffolding as a direct application and operationalisation of Vygotsky's concept of teaching in the zone of proximal development (Wells, 1999), to the view that the notion of scaffolding only partially reflects the richness of Vygotsky's zone of proximal development (eg Daniels, 2001). In addition, the limitations of the metaphor of scaffolding in interpreting the zone of proximal development have been revealed (Stone, 1998).

Gordon Wells referred to scaffolding as "a way of operationalising Vygotsky's (1987) concept of working in the zone of proximal development" (1999, p.127). He identified three important features that give educational scaffolding its particular character: 1) the essentially dialogic nature of the discourse in which knowledge is co-constructed; 2) the significance of the kind of activity in which knowing is embedded and 3) the role of artefacts that mediate knowing (Wells, 1999, p.127)

Mercer and Fisher (1993, in Wells, 1999) view the ZPD characteristic of transfer of responsibility for the task to the student as the major goal of scaffolding in teaching. In order to qualify as scaffolding, they propose, a teaching and learning event should: a) enable the learners to carry out the task which they would not have been able to manage on their own; b) be intended to bring the learner to a state of competence which will enable them eventually to complete such a task on their own; and c) be followed by evidence of the learners having achieved some greater level of independent competence as a result of the scaffolding

experience (Wells, 1999, p. 221). The emphasis of their definition is on the collaboration between the teacher and the learner in constructing knowledge and skill in the former.

Other authors see the metaphor of scaffolding as limited compared to the notion of the ZPD. According to Lave and Wenger (1991, in Daniels, 2002) scaffolding captures teaching performance as a one-way communication process compared to the notion of the ZPD which emphasises teacher-learner collaboration and negotiation. Thus, scaffolding can be seen as a one-way process wherein the scaffolder constructs the scaffold alone and presents it for the use of the novice (Daniels, 2002, p. 59).

Stone (1998) explains that narrowness of the term scaffolding is due to the connation of the metaphor itself. He provides a critical analysis of the metaphor of scaffolding in its application to the field of learning disability. Stone pointed out the twofold role of metaphor in scholarly understanding of a phenomenon. On the one hand, "a good metaphor… is more than a novel label or a graphic description of a phenomenon. If it has been aptly chosen, a metaphor can help us to appreciate as yet unanticipated connections or consequences. In this latter sense, a metaphor is not so much descriptive as it is generative of new ideas" (Stone, 1998, p. 344). On the other hand, a metaphor can hinder further understanding of the phenomenon, as the metaphor can be misleading in finding its essential characteristics and connections (Stone, 1998).

Analysing a number of limitations of the scaffolding metaphor, Stone referred to a study of Searle (1984, in Stone, 1998) who expressed the concern that too literal an adherence to a scaffolding metaphor, especially in the hands of insensitive teachers, could result in "the imposition of a structure on the student" (Stone, 1998, p. 349). In other words, the metaphor of scaffolding can lead to viewing the adult-child interaction in the classroom as predominantly adult-driven and one-sided in nature. This view, if applied to classroom teaching, might take educators back to a pre-Piagetian, traditional way of teaching through direct instruction. In such a case, the concern expressed by Annette, the supervising teacher in our example at the beginning of this paper, can be understood and supported.

A great contribution of Piaget to the theory and practice of education was his view of the child as an active constructer of their own knowledge, as an independent discoverer and explorer, recently known as cognitive or individual constructivism (Berk, 2002; Krause et al, 2003; McDevitt & Ormrod, 2002). The implication of this is that initiative and self-determination of the child as a learner should not be hindered by educational instruction. Vygotskian theory was built upon the Piagetian idea of the child as an active learner with the emphasis on the role of social interaction in learning and development. This approach has become known as social constructivism (Krause et al, 2003; McDevitt & Ormrod, 2002). The quality of child-adult interaction is seen as crucial when scaffolding children's learning (Bodrova & Leong, 1996; Fleer, 1992, 1995; Tharp & Gallimore, 1988).

Summarising the limitations of the scaffolding metaphor, Stone (1998) reveals that a number of educational and developmental psychologists are questioning the theoretical and practical value of the metaphor. However, he concludes, the metaphor should not be abandoned (Stone, 1998, p.351). At this stage it is difficult to imagine, how the scaffolding metaphor could be abandoned as it has been widely accepted, studied and applied to different KLAs by an increasing number of educational researchers and practitioners (eg Devlin, 2000; Dixon-Krauss, 1996; Donovan & Smolkin, 2002; Doolittle, 1997; Hammond, 2002; Jacobs, 2001; Kong, 2002; Rasmussen, 2001 etc). However, it is essential to keep in mind that a literal interpretation of the scaffolding metaphor might lead to a narrow view of child-teacher interaction and an image of the child as a passive recipient of a teacher's direct instruction. This falls far behind the Vygotskian idea of the ZPD and the Piagetian view of the child as an

active self-explorer. A deeper understanding of the theoretical underpinning of the scaffolding metaphor will promote its creative and informed use by educators.

Understanding the Zone of Proximal Development

The zone of proximal or potential development perhaps is the best known concept of Vygotskian socio-cultural psychology. Initially, it was elaborated for psychological testing in schools (Vygotsky, 1962). Vygotsky stated that testing should be based not only on the current level of a child's achievements but also (and mainly) on the child's potential development. The actual level of development (level of independent performance) does not sufficiently describe development. Rather, it indicates what is already developed or achieved, it is a "yesterday of development". The level of assisted performance indicates what a person can achieve in the near future, what is developing (potential level, "tomorrow of development", what a person "can be") (Vygotsky, 1978). Thus, the zone of proximal development is the distance between what a person can do with and without help. The term proximal (nearby) indicates that the assistance provided goes just slightly beyond the learners current competence complementing and building on their existing abilities (Cole & Cole, 2001).

The concept of the ZPD can be fully understood only in the context and as part of Vygotskian theory on the whole. "In fact, failure to see the connections between the zone and the theory as a whole means that it is difficult to differentiate Vygotsky's concept from any instructional technique that systematically leads children, with the help of an adult, through a number of steps in the process of learning some set of skills" (Tudge, 1992, p. 156).

Yaroshevky (1989) stated that the idea of ZPD manifests Vygotsky's position on the issue of links between education and development. To arrive at this position Vygotsky had to overcome two types of reductionism - biological, which is the normal maturing of the physical brain and sociological, the appropriation by the child of society's cultural assets (language, etc) thrust upon it by adults. It is within this latter area that Vygotsky placed his ZPD by arguing that rather than having education dragging behind in sociological development it must anticipate it - it must "run ahead as the adult helps the child to climb the next step"(Yaroshevsky, 1989, p.277). Vygotsky recognised that the distance between doing something independently and with the help of another indicated stages of development, which do not necessarily coincide in all people. In this way he regarded an instructors "teaching of a student not just as a source of information to be assimilated but as a lever with which the student's thought, with its structural characteristics, is shifted from level to level". (Yaroshevsky, 1989, p.283)

As pointed out by Stone (1998), Vygotsky never used the scaffolding metaphor (as it wouldn't make much sense to a Russian-speaking person). However, his notion of the ZPD was of a metaphorical nature itself (Paris & Cross, 1988, in Miller, 1993) and wasn't elaborated in much detail. There "remain a number of questions about how the concept should be understood" (Wells, 1999, p. 313).

In the last three decades there was a number of significant publications which further developed theoretical understanding of the ZPD in its connection to instruction (Chaiklin, 2003; Cole, 1996; Tharp & Gallimore, 1988; Tudge, 1999; Wells, 1999; Wertsch, 1985, 1998).

Vygotsky stated that consciousness is constructed through a subject's interactions with the world. Development cannot be separated from its social and cultural context. This led to the idea that we can only understand mental processes if we understand the social interaction and

tools and signs that mediate them. Wertsch (1985) believed that it was with this concept of mediation that Vygotsky made his most important and unique contribution to our understandings of children's development.

According to Vygotsky, the most important part of children's psychological development is acquisition of the culture to which they belong. Everything that is manufactured and created by people in a culture, that is, all cultural products, is labelled an artefact and it is through these artefacts that the culture influences development. Included are all the things we use, from simple things such as a pen, spoon, or table, to the more complex things such as language, traditions, beliefs, arts, or science (Cole, 1997; Vygotsky, 1982).

Vygotsky emphasised that social interactions are crucial for development from the very beginnings of a child's life. He asserted that any higher mental function necessarily goes through an external social stage in its development before becoming an internal, truly mental function. Thus, the function is initially social and the process through which it becomes an internal function is known as internalisation (Vygotsky, 1962). The role of social mediation in human activity has been strongly emphasised by Engestrom (1996).

Central to the concept of mediation is intersubjectivity which is described by Wertsch (1985, 1998) as the establishment of shared understandings between the child and the adult (Dixon-Krauss, 1996). Intersubjectivity is an essential step in the process of internalisation as the adult gradually removes the assistance and transfers responsibility to the child.

Thus, to understand the complexity of ZPD, it is necessary to take into account such concepts as tool mediation, social mediation of learning, internalisation, intersubjectivity and the active position of the child in learning. When we talk about working in the zone of proximal development, we look at the way that a child's performance is mediated socially, that is, how shared understanding or intersubjectivity has been achieved. This includes the means by which the educator reaches and meets the level of the child's understanding and then leads the child from there to a higher, culturally mediated level of development. This leads to the idea of tool mediation, that is, to a consideration of what cultural tools have been provided for the child to appropriate and use on their own in their independent performance. It also includes a consideration of the conditions that have been created for the tools to be internalised. In other words, what techniques have been used to ensure the transformation of assisted performance into independent performance.

In the story described at the beginning of the paper, Marcia was asking children a prediction question, 'Do you think the Duck will come back?' What cultural tools does this question provide? Obviously, the question modelled the technique of prediction. The next question that arises in this case is whether intersubjectivity between the child and Marcia has been achieved. Has, in fact, Marcia considered the child's initial understanding of the story? Before scaffolding the child's reading, did she find out what they thought about a possible continuation of the story? Perhaps not.

Understanding Scaffolding

The interpretation and operationalisation of the scaffolding metaphor in educational research is highly diverse and "is sometimes used loosely to refer to rather different things" (Hammond, 2002, p.2). Scaffolding has been interpreted in a wide sense as "a form of support for the development and learning of children and young people" (Rasmussen, 2001, p.570). The term can be used as an umbrella metaphor to describe the way that "teachers or peers supply students with the tools they need in order to learn" (Jacobs, 2001, p.125). The framework of systematic theory, in conjunction with a number of other educational

theories(Jacobs, 2001; Rasmussen, 2001) enrich the context of implementation of the scaffolding metaphor but makes it more generic. Hammond and her colleagues (2002) argue that extended understanding of scaffolding in language and literacy education is needed. They point out the crucial role of language in scaffolding.

A more specific study of scaffolding is presented by Donovan and Smolkin (2002). They take a critical look at the issue of scaffolding in children's writing. They research the role of different levels of scaffolding in children's understanding and demonstration of their knowledge of genre. Tasks range from those that provide minimal or low level support to those that provide middle or high levels of support (contextual and visual support). Interestingly, the highest level in their range of scaffolding is described as a "direct instruction with revision" (Donovan & Smolkin, 2002, p.435). Their research revealed, however, that while scaffolding can assist children it may also, at times, hinder children in demonstrating their full range of genre knowledge (Donovan & Smolkin, 2002, p.428). This finding confirms our concern that scaffolding, when understood as direct instruction, might become counterproductive. Furthermore, some texts for pre-service educators also refer to direct instruction as at the highest level of scaffolding (Berk, 2000, p. 261).

Some other texts focus on the techniques of scaffolding as various forms of adult support: demonstration; dividing a task into simpler steps; providing guidelines; keeping attention focused (McDevitt & Ormrod, 2002) as well as providing examples and questioning (Eggen & Kauchak, 1999). Breaking content into manageable pieces also seems to be a common feature of scaffolding that has been emphasised in the texts (Berk, 2002; Eggen & Kauchak, 1999; McDevitt & Ormrod, 2002; Krause et al., 2003).

Conclusion

This paper presented an analysis of the metaphor of scaffolding in its connection to the Vygotskian concept of the zone of proximal development. In spite of the obvious limitations of the metaphor compared to the notion of the ZPD, scaffolding remains increasingly popular among educators - researchers and practitioners. The term appears in the most modern educational psychology textbooks which cover the theory of Vygotsky. As the scaffolding metaphor provides an easy to grasp justification of teacher intervention in learning, it can be a hindrance rather than a help for children's development depending on the context of its use. A deeper understanding of the theoretical underpinning of the scaffolding metaphor will promote its creative and informed use by educators.

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