Metaphorical and visual representations of scaffolding

Richard S. LAVIN and Yukari NAKANO

Abstract

The present paper explores some of the ways in which the notion of scaffolding has been represented visually in the literature. The work builds on the research introduced in Lavin and Nakano (2017), where we explored some problems in the ways in which the underlying spatial metaphor of the ZPD was traditionally exploited, seeking in the literature some innovative visual representations thereof and finally proposing some new visual representations to depict the notions of movement within the ZPD, as well as the ZPD in social context and in pairwork. The present paper shows how representations of the related notion of scaffolding have focused on different aspects of the notion, usually emphasizing a small number of its defining features. We also offer our own representation of a different subset of the various aspects of scaffolding, focusing particularly on how the notion can be related to that of the ZPD. Without three-dimensional displays, it may not be possible to represent all important aspects of the notion simultaneously, but it is hoped that this brief survey together with our proposal will increase awareness of the issues involved in choosing a visual representation and, when dealing with scaffolding within a Vygotskian framework, show the importance of relating scaffolding to the spatial metaphor of the ZPD.

1. Introduction

Vygotskian and neo-Vygotskian sociocultural theory has held a fascination for many language teachers since English translations of Vygotsky's work appeared in the last few decades of the twentieth century. Yet there

are countless difficulties regarding how Vygotsky's ideas should be interpreted and put into practice by teachers.

Swain et al. (2015) make a valiant attempt to render sociocultural concepts relatable by employing a range of teacher and learner narratives to illustrate concepts such as the zone of proximal development. This is a most valuable project, but for us it has a key limitation: It does not make use of visual aids to illustrate concepts, and we believe that this limits potential uptake.

Thus, in this paper we build on the work on visualizing the ZPD in Lavin and Nakano (2017) by illustrating the related notion of scaffolding. We also make mention of attempts to link scaffolding to other related notions, including that of the ZPD. We conclude with our own proposed visual representation of scaffolding that also links the notion to the ZPD.

2. The ZPD

We begin by reproducing here a figure from Lavin and Nakano (2017, p. 49) (shown here as Fig. 1) that shows two students engaged in pairwork. The student on the right has a larger ZAD (zone of actual development) than the one on the left. The student on the right also has a larger ZPD (zone of proximal development) than the one on the left. The ZPD was defined in Lavin and Nakano (2017) as:

the area between the space representing internalized problem-solving

Fig. 1: The ZPDs of two students engaged in pairwork. ZPDs are the second of the three concentric circles (yellow in the colour originals)

skills (the zone of actual development, ZAD) and the space representing problem-solving skills beyond current capabilities (the zone of potential development, ZoPD), i.e. the area where problems can be solved with guidance. (p. 42)

(It should be noted that any external limit on the outer band is just a diagrammatic convention: there is no principled reason to suggest an absolute limit on what an individual could learn given enough time.)

3. Existing definitions and visual representations of scaffolding

Scaffolding can be conceptualized as the structured support that allows a learner to do things successfully that she could not do without that support. Using the movement-through-space metaphor of the ZPD, we can say that, since performing a task successfully lays the groundwork for eventually performing it alone, the task has moved inwards within the ZPD in the direction of the ZAD.

Scaffolding has been described, defined, and discussed countless times since Wood et al.'s (1976) seminal paper, where scaffolding is described as an adult "*controlling* those elements of the task that are initially beyond the learner's capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence" in such a way that it results eventually "in development of task competence by the learner at a pace that would far outstrip his unassisted efforts" (p. 90).

Wood et al. point out a precondition for success with scaffolding: "comprehension of the solution must precede production". In other words, it is not possible to scaffold any arbitrary skill or knowledge that we would like the learner to master. Although deep understanding may not be necessary, the learner needs to be able to recognize in some way that the operations led by the scaffolder make sense in the context of the problem or situation.

The six defining features of scaffolding as listed by Wood et al. are:
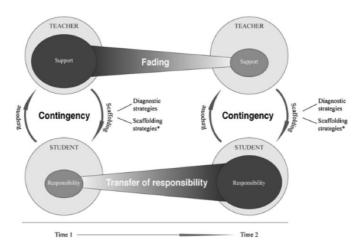
    1. recruiting interest in the task,

Fig. 2: Van de Pol et al.'s representation of scaffolding, focusing on contingency, fading, and transfer of responsibility

2. simplifying the task,

3. maintaining pursuit of the goal,

4. marking critical features and discrepancies between what has been produced and the ideal solution,

5. controlling frustration during problem solving, and

6. demonstrating an idealized version of the act to be performed.

Other researchers have from time to time provided slightly different lists of defining features. For example, Walqui (2006) lists:

1. Continuity: Tasks are repeated, with variations and connected to one another (e.g. as part of projects).

2. Contextual support: Exploration is encouraged in a safe, supportive environment; access to means and goals is promoted in a variety of ways.

3. Intersubjectivity: Mutual engagement and rapport are established; there is encouragement and nonthreatening participation in a shared community of practice.

4. Contingency: Task procedures are adjusted depending on actions

of learners; contributions and utterances are oriented towards each other and may be co-constructed (or, see below, vertically constructed).

5. Handover/takeover: There is an increasing role for the learner as skills and confidence increase; the teacher watches carefully for the learner 's readiness to take over increasing parts of the action.

6. Flow: Skills and challenges are in balance; participants are focused on the task and are 'in tune' with each other.

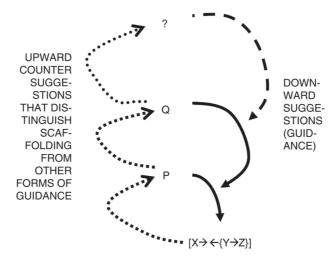Although Wood et al. did not link the concept of scaffolding explic-

Fig. 3: Valsiner's (2005) depiction of the reciprocal nature of scaffolding

itly to sociocultural theory, it very soon became clear that the Vygotskian notion of the ZPD was a natural fit, to the point where the two concepts are sometimes seen as having been parts of the same framework all along. (We will note in passing that there are strong critics of this linkage, among them Lantolf and Thorne, 2006.) Skills or operations that could be successfully scaffolded could be defined as those that were in the learner's ZPD. (Switching things round a bit, we might say that the ZPD consists of those things that the learner cannot produce but can comprehend and/or see a path to acquiring.)

Scaffolding as defined by Wood et al. involved a gradual transfer of re-sponsibility from the scaffolder to the scaffoldee. As pointed out by Stone (1996), many researchers built upon Wood et al.'s work by examining what this transfer of responsibility entailed. Van de Pol et al. (2010) visu-alize this as in Fig. 2 (p. 274). Progression through a task in time is shown from left to right. At the beginning of the process, the teacher assumes the lion's share of responsibility, providing large amounts of support. This support is contingent in the sense that the teacher withdraws support that she finds is no longer necessary. This could be simply through an intuitive sense or through various strategies. Thus, the support fades over time, as the student's responsibility correspondingly increases.

Valsiner (2005) focuses on the interactive and reciprocal nature of the scaffolding process, where the learner is an active participant, making counter-suggestions in response to the scaffolder's guidance. These count-er-suggestions (which could take the form of actions rather than words) serve to let the scaffolder refine his hypotheses regarding the knowledge and capabilities of the learner, making it possible to give better-tuned guid-ance (p. 199). This aspect of scaffolding is shown in Fig. 3.

Other scholars in their representations have attempted to link scaf-folding to the ZPD and other notions. For example, Rojas-Drummond et al. (2013, p. 12) relate scaffolding both to the ZPD and three planes of sociocultural activity, the personal plane, the interpersonal plane, and the community plane, recognizing that what happens between small numbers of people, for example in the classroom, is related to the wider community of which the classroom is a part. This representation is shown in Fig. 4.

Van Lier (2004, p. 158) suggests that being the beneficiary or recipient of scaffolding is complementary with other kinds of interaction, such as interaction with equal peers, accessing one's own inner resources, and pro-viding scaffolding to others. This idea is depicted in Fig. 5.
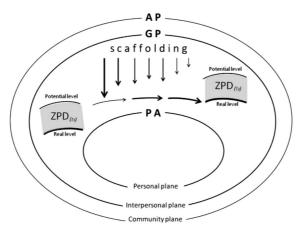
Fig. 4: Rojas-Drummond et al.'s (2013) depiction of scaffolding and the ZPD within three planes of sociocultural activity
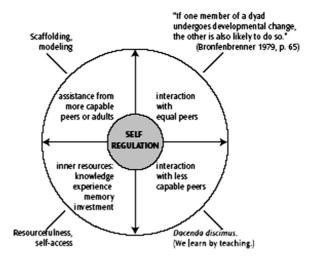

Fig. 5: Van Lier's (2004) depiction of scaffolding and other forms of support

4. A proposal

Of the figures seen so far, Rojas-Drummond et al.'s (2013) representation (Fig. 4) and Van Lier's (2004) attempt to relate scaffolding to the

ZPD. To us, Rojas-Drummond et al.'s representation seems to obscure the relationship rather than illuminate it, perhaps because of the laudable attempt to also incorporate the three planes into the same figure. We suggest that that might be better done at a later stage, after first clarifying the relationship between scaffolding and the ZPD.

Van Lier's (2004) representation is intriguing. It shows how various kinds of interaction as well as a learner's inner resources can all work as resources for expanding the learner's capabilities. Those resources are arranged around a center labelled "self-regulation", which presumably should be interpreted as shorthand for capabilities available through self-regulation alone.

Our first thought is that, while Van Lier's (2004) representation aptly shows the various kinds of resources that could be available across a whole range of situations, it is not very useful as a representation of any specific situation (where not all of the four types of resources may be available or relevant). In addition, related to the above point, it is a static depiction, making no attempt to show how a learner's situation may change over time under the influence of scaffolding. We should also mention here that in the recent literature scholars tend to use a broader, and also narrower, defini-
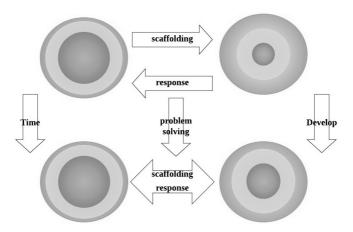

Fig. 6: Our depiction of scaffolding during problem solving

tion of scaffolding than Van Lier (2004) does. On the one hand, interaction with peers is now often treated as a form of scaffolding, meaning that three of the four outer quadrants could be combined into one; on the other, accessing internal resources implies that the learner already has appropriated the capabilities in question, which would mean that the fourth outer quadrant could be included in the center.

As a way to depict the microgenetic (or short-term; Lantolf & Thorne, 2006) development of the learner's actual and latent capabilities as scaffolding occurs, using the same basic style as in Fig. 1, we offer Fig. 6.

Although rather crude, this representation has a couple of advantages:
1. It has a dynamic aspect, showing how the learner's capabilities change over time in the course of scaffolding.
2. Scaffolding is depicted as an activity or process that acts on the individual to bring about change.

There is no definitive way of validating or demonstrating the "correctness" of this kind of figure. The test lies in whether or not it can be profitably used to illustrate educational activities in a way that enhances understanding. Clearly, there is much work still to be done in this respect. In further research, we plan to develop further representations that also incorporate some of the other aspects of scaffolding described in this paper, such as fading.

Without color and three dimensions, it may never be possible to represent adequately all relevant aspects of scaffolding, but, by matching visual features with actual features in a principled way, with a clear conception of the metaphor(s) we are employing, it should be possible through a series of figures to show the key aspects of scaffolding that we wish to communicate to readers.

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