

## Knowledge Building for deeper understanding at different levels

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Bert Reijnen, Frank de Jong

Stoas Professional University is the bachelor in education university for agricultural education in The Netherlands. In 2005 we started with a competence-based curriculum. After two years of research and development by our own staff and in cooperation with the workfield (teachers and managers in secondary vocational agricultural schools, as well as agricultural employers), we constructed a curriculum that was based on critical situations. We call it Professional Situations (PS). A few examples: PS 2 Learning situations with practical instruction; PS 5 Coaching situations of students; PS 12 Situations with learning and behavioural problems; PS 17 Management situations in the Land based and Nature based sector (the green sector).

Frank de Jong, lector and chair of the Knowledge Circle, a group of teacher-researchers, of the university invited me and my colleague Arjen Nawijn to visit the IKIT Summer Institute in august 2006. As member of the knowledge circle I do a research on the topic "the role of supportive learning in competence-based education". The underlying problem for this research is the changing position of the education that is given by the teachers of the university and the changing role of the teachers themselves in competence based education. A great deal of experiencing, learning about and building the competences that are required in a Professional Situation takes place in the workplace. That is the reason why all students are three days at a workplace, mostly the schools, , coached by an experienced professional, and two days at the university for supportive learning. The role of the supportive learning is no longer "putting knowledge in the heads" and hoping that students have some profits in their teaching practice (I know I exaggerate the old situation), but to make profit of the input from student's workplace-experiences. Doing so causes the fear of teachers that the level of knowledge, what they think that students need to know, is vanishing. Simultaneous their own role seems to change from professional expert to walking encyclopaedia or oracle. Reasons enough to research the institutional part of the competence-based curriculum, supportive learning.

After a co-research about learning styles (Kolb) by Dian van Limpt (2006), student and colleague, she determined that a difference in learning styles of students and teaching styles of teachers is not a problem in the new curriculum. The variety of teachers and workplace coaches, together with the diversity of professional situations and their competences, guarantees enough possibilities for students to take profit of their own learning style and to experience with other learning styles. To give more attention to different learning styles and teaching styles was not the crucial approach to improve the supportive learning. When I got familiar with the principles of knowledge building, knowledge creation and Knowledge Forum at the Summer Institute 2006, I saw it as a challenge to do an action research with my own students. My hypothesis was that using knowledge building in my own lessons could cause a paradigm shift on supportive learning, and thereby a valuable contribution to the research. Could it be that working with knowledge building gave me a handout to the dilemmas described below:

- supportive learning is not enough connected with the experiences of students in the workplace
- supportive learning should bring a quality-improvement of knowledge on conceptual level

I still remember the excitement when Frank and I decided to implement knowledge building in my lessons. The lessons started three weeks later so there was a lot to do. Thanks to the excellent support of Learn in Motion and its helpdesk, we could start with knowledge building and Knowledge Forum in September 2006.

The group of sixteen students that I should teach was already formed. That means that no-one volunteers, but was put together ad random and at a regular way groups are formed in our curriculum. A big advantage for the research was that there was also a control group of thirty students that was not going to work with knowledge building. The students were in their third year of study and had different specializations (recreation animals, animal husbandry, horse keeping, special education). They were all working on PS 5: Coaching situations of students. For both groups and randomly over the groups workplaces were different: pre-vocational and vocational education at agricultural schools. The project was implemented in a 75 minute session each week during 15 weeks. Next to this session the supportive learning for PS 5 existed of 150 minutes colleges (activating lessons, workshops and practical training) and two days workplace learning.

For the KB-group we focussed on our 75' session idea-centered knowledge building, and considered the other lessons as the possibility to get informed by external sources (e.g. lessons and teachers). That was just opposite to the idea that students had. Normal, like the control group, the 75' session was created to work on assignments that were given by the teachers during colleges.

To master the idea of knowledge building by students, a start-up meeting was organised. Two principles of knowledge building were put in the centre: the idea-centred approach (Scardamalia, 2001) and the difference between belief mode and design mode (Bereiter, 2006). I used the metaphor of driving a car and looking in the rear-view mirror for learning in belief-mode (learning about the things that are already known), and looking through the windscreen for learning in design-mode, looking forward in the 'to design' world and, using the rear-view mirror when it's useful. It caused the first enthusiast reactions of discovering something new.



**Belief Mode**  
"This is the way it is"



**Design Mode**  
"This is the way it can be"

Later on in the process, when the notion of idea-improvement and designing new ideas about coaching were evaluated and discussed, students remembered this metaphor. "Ah, you mean looking through the windscreen, but now I need to look in the rear-view mirror to get some support by (authoritative) sources".

After evaluation with the students we conclude that there were three phases in the whole process. Each phase had his own character and his own emphasis on knowledge building principles (Scardamalia 2002).

### Phase 1: *enthusiasm and uncertainty*

In the first period students are motivated for the new approach (knowledge building) and the appealing software (Knowledge Forum in enhanced mode). But also they are uncertain about reaching the goals of this professional situation, the competences they have to acquire. By researching the materials that are available in the curriculum they get a better idea about 'coaching students'.

In this phase the following principles of knowledge building are achieved:

- real ideas, authentic problems
- improvable ideas
- democratizing knowledge
- knowledge building discourse

### Phase 2: *influence and responsibility*

In this phase the influence of the students on the assessment is increased. Students construct in cooperation with each other their own assessment schedule. They construct rubrics for each part of the assessment. The result is:

- a collective responsibility for the assessment
- deeper and more fundamental knowledge of the competences to acquire
- meeting the needs of learning people: relation, competence, autonomy (Stevens, 1996)
- enlarging the effective use of Knowledge Forum.

In addition to the principles of phase 1, is now also made a start with:

- community knowledge, collective responsibility
- epistemic agency (knowledge creation attitude/behaviour)
- embedded and transformative assessment

### Phase 3: *recognition and development*

In an oral evaluation halfway the process students emphasize the wish to enlarge the link between supportive learning (including knowledge building and Knowledge Forum) and their workplace-learning. To improve the ideas of coaching we decide together with them to use the notes and build-ons that are already put in Knowledge Forum, put it to clusters of interest (by keywords) and organise sessions to improve the ideas that are already known. Every session leads to one or more rise-aboves. This is experienced by students as the most successful part of the whole period. The objects of interest were close to coaching questions like group behaviour and coaching, coaching of students with a weak self-esteem, coaching under the waterline, a.o. Subjects that are more fundamental discussed then is offered in the regular supportive learning.

The result of this period is that students are recognized in the real needs they have in the workplace context.

In addition to the principles of phase 1 and 2, the students also used:

- knowledge building discourse
- constructive uses of authoritative sources
- rise above

After all we can conclude that during the whole period the focus of the students is shifted from individual to community knowledge, from supply to demand and from university-knowledge oriented to deeper workplace oriented knowledge.

The students evaluated the experiment as useful and interesting. Their opinion was that they had learned a lot about coaching students (PS 5), and also about the possibilities of Knowledge Forum. In a final inquiry that also asked for the thoughts they had about knowledge building and knowledge creation were a couple of answers:

"Our results are useful to develop", "The knowledge building discussions gave me better understanding of coaching", "Our ideas are improvable", "I'm proud of what we achieved".

Knowing these positive opinions, it was surprising to hear from the students in the final oral evaluation that they did not have the feeling to have created some knowledge themselves. They still had the idea that knowledge creation is something for scientists. The feeling that

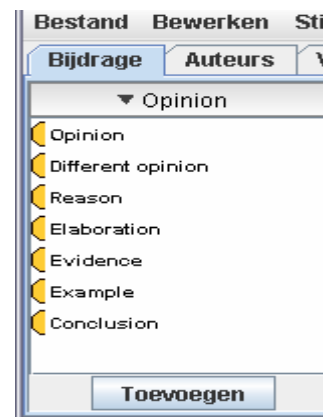
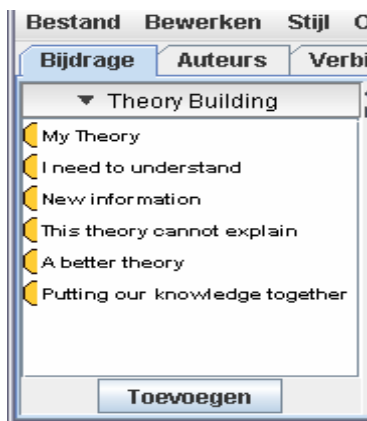
they had designed new knowledge for their own learning community, what definitely happened, was still strange to discover.

There are two options to declare this feeling.

1. The way that students worked with ideas

This is visualised in the kind and number of scaffolds they used.

Theory building		Opinion	
My Theory (my idea)	13,5 %	Opinion	13,0 %
I need to understand	24,0 %	Different opinion	6,3 %
New information	14,4 %	Reason	1,4 %
This theory cannot explain	1,9 %	Elaboration	7,2 %
A better theory	10,1 %	Evidence	0,5 %
Putting out knowledge together	1,9 %	Example	3,4 %
		Conclusion	2,4 %
Sum	65,8 %	Sum	34,2 %



Most of the input is formed by notes and build-ons about theory building in the knowledge building category (65,8%), however these messages contain mainly own ideas and theory, questions (I need to understand) and new information. A real dialogue about these questions and ideas did not happen, nor did they put their individual knowledge together. In phase 3 they had their knowledge 'building' dialogue (more then the exchange of ideas) and some rise above notes were placed, but the students did not recognize this as knowledge building.

This brings me to the second declaration.

2. the cognitive responsibility and the role of the teacher

The students we speak of are third year bachelor of education students. Teachers, coaches and managers of the university consider them to be self-responsible learners. And the most of them are. They come to college, do their assignments and are concerned about their results. That is why students in phase 1 asked me for an assignment, a task to do. *Their implicit theory (.....) was that learning follows naturally from carrying out learning activities and completing tasks* (Scardamalia). The responsibility of the cognitive activity however is delegated to the teacher. When I should have put myself in a teacher A position (giving more assignments and tasks to do and fully taking over the responsibility of their cognitive development) the students had reacted satisfied. In order not to loose the students in our (them and mine) developing process I stimulated them to put together their own task (phase 2). In my opinion a teacher B position, where already more strategic cognitive activity is turned over to the students. The problem is that students are not enough aware of this change. Making them responsible for their own learning means more attention for community knowledge, collective responsibility and own cognitive responsibility. More coaching and reflective activities on cognitive responsibility can bring me to a teacher C position. Striking is that what students gave back in the final evaluation. *"When we do this next time, please coach us more directly on the knowledge building process"*.

A useful help should have been the analyse tools in Knowledge Forum. These tools were not available for us at the time that we did the project, but only later on in the final evaluation. It can be a beautiful instrument to coach the process and make the contributions and progresses visible.

It is possible that the students' satisfaction of phase 3 is the strongest in the relation with the workplace. A relation with the level of feeling responsible. In the workplace students are three days a week directly appealed to the competences they need in that context (coaching of students). It is an authentic situation. Pupils expect a good lesson, good coaching in their learning process, a reliable teacher, and workplace coaches expect an interested and serious junior-teacher. Teacher-students feel more responsible for the workplace performance than for their own cognitive development. Here lies an opportunity to link the supportive learning of the competence-based curriculum with knowledge creation and cognitive responsibility.

Let us see what this has brought us in terms of "deeper understanding".

After five months the Knowledge Building group and myself as teacher-researcher concluded that the following levels of deeper understanding were achieved.

1. *Understanding Knowledge Building and Knowledge Forum*

Students were easily motivated to work with the Knowledge Building approach and the Knowledge Forum facilities. Working and discussing together we discovered the difference between shallow and deep constructivism and working in design mode instead of belief mode (Bereiter, 2006).

Quote of students Andrea and Bert

*"By reading the notes and opinions of others we are able to review our opinion and we can try out another approach. It enriches our possibilities and we become more expert on coaching pupils".*

2. *Deeper understanding of learning processes*

Although "learning processes" was not the subject of the students attention (that was: coaching pupils in vocational education), we developed a different approach of competence based education. In the Knowledge Building time the issue was improving ideas of coaching as experienced by students during three days a week at schools. The learning process shifted from task- and activity-oriented to idea-improvement and cognitive responsibility (Scardamalia, 2001).

Quote of student Elvira:

*"Working with Knowledge Building changed my attitude from 'what do they want me to do for school?' to 'how can I be a better coach for my pupils and what do I have to learn for that?'"*

3. *Deeper understanding of competences*

Competences to build (i.e. recognize problems from child-behaviour; coaching dialogue; professional distance; building and keeping a good relation with a child; etc.) are rather vague described in levels to achieve. Working with the idea of coaching and the need to make clear what these competences are about, gave students a deeper understanding of the competences.

4. *Deeper understanding of the changing role of the teacher.*

Competence-based education is a new way of learning. It requires a different role of the teacher. It seems that the teachers role is besides being the expert, also the facilitator and stimulator of the learning-process. Working with Knowledge Building it

became clear, in the beginning, that students are still expecting tasks and activities to fulfil. Strange enough students still show a dependency in their behavior on teacher regulation by obligated learning task assignments. Even although in our competence directed educational process we assume a student directedness. During the process it became clear that my teacher behaviour should change from a type A or B teacher (giving explicit or implicit no strategic cognitive activity to the students) to a type C teacher. At the end of the process students became more and more responsible for their own learning. An attitude achieved by a process that we discovered together: students, teacher-researcher and lector.

Working with knowledge building, knowledge creation and Knowledge Forum has the effect that more colleagues of Stoas Professional University are interested in working with this idea centred didactic. Next course, fall 2007, four teachers are going to use KB and KF. Also one of the secondary schools, Centre of Agricultural Education is interested. A new research in the Knowledge Circle of Stoas Hogeschool starts with the subject "new didactics in competence based learning" as result of the research and outcomes of the experiences that is written above.

During the process data has been gathered. The first analysis give the following results:

- The knowledge building students have the same results (measured in obtained ects and assessments over the whole semester) as the regular students.
- In the practice of coaching-conversation they do better
- In the test 'knowledge about handling children with learning and behaviour problems' they do better
- A more extensive analyse report is available.

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Bert Reijnen

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