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# Scaffolding students' assignments

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### **Abstract**

This article discusses scaffolding in typical student assignments in mother tongue learning materials in upper secondary education in Denmark and the United Kingdom. It has been determined that assignments do not have sufficient scaffolding end features to help pupils understand concepts and build objects. The article presents the results of empirical research on tasks given in Danish and British learning materials. This work is based on a further development of my PhD thesis: "Learning materials in the subject of Danish" (Slot 2010). The main focus is how cognitive models (and subsidiary explicit learning goals) can help students structure their argumentative and communicative learning processes, and how various multimodal representations can give more open-ended learning possibilities for collaboration.

The article presents a short introduction of the skills for 21st century learning and defines, on the shoulders of linguistics research, results of "assignment-didactics" as a useful but also very tentative term in the context of the assessment of design principles for the design of assignments. Based on empirical studies, I discuss cognition, multi-modality and collaboration as crucial types of scaffolding in students' assignments. Finally there will be a discussion of learning materials.

**Keywords**: student assignments, scaffolding, cognitive tools, multimodality, collaboration

IARTEM *e-Journal* Volume 7 No 1 Scaffolding students' assignments Marie Falkesgaard Slot 1-15

### Introduction

In this article I present real-life examples of assignments that I examined for my thesis to demonstrate that, in spite of the research indicating its usefulness and importance, many assignments given to students have very little or no in-built scaffolding. I will then give examples to show how teachers have succeeded in teaching with assignments and exercises where the students were scaffolded.

# Skills for the 21st century - new assignments required

Theoretically, this article is based on didactics and design theories of multi-modality (Vygotsky 1980, Kress 2005, Jewitt 2008 & Saywer 2005). Another aspect of my field of research is *Innovative Teaching and Learning* (ITL) research, which points out that the most important skills to bring into 21st century are:

- Collaboration
- Knowledge building
- Real-world problem solving and innovation
- Use of ICT for learning
- Self-regulation

(Shear, Hafter, Miller, & Trinidad 2011)

While innovative teaching of courses exists in many contexts, most of the countries that are engaged in it still have a large gap between the desired goals and the typical classroom instruction and assignments. In this context, ITL research is particularly relevant as it extends the subject field to include analysis of student products with an analytical tool to operationalise the 21st century skills often formulated in abstract terms like creativity and innovation (Shear et al. 2011). ITL Research demonstrates a significant correlation between innovative teaching and student product. In ITL research there is no subject-specific approach to the function of scaffolding in assignments in the subject of Danish and therefore my contribution is also a didactic one. In a large-scale national school project funded by the Danish Council of Education called "Demonstrationsskoleprojektet", a school development project, some of the same didactic approaches described in this article have been included.

# Assignments and assignment didactics

To maximise the didactic outcome of assignments, there should be a focus on metacognition, strategies of reading and understanding context in the design phase. Other relevant focus areas are:

- The importance of preconceptions, which gives students access to understand specific subject knowledge;
- Developing skills;
- Contextualising what is worth knowing in a subject (Hedeboe 2002, Skjelbred 2010).

In order to support the learning possibilities of students, both individually and when cooperating, one definition of the learning goals of an assignment could be to:

help students to highlight a subject and flag a taxonomy and therefore control their understanding both of what the important knowledge is, and in turn what they should notice, and hence how the text should be read (...) Assignments provide useful signals about what is most important, and what a reader should concentrate on (Skjelbred 2009, 279-280).

This definition focuses on the important role assignments play for students in helping them to understand what "counts" as knowledge in a given subject or in a given school context. Assignments should also point out what "good performance" is and therefore explicate to the learner how to reach "good performance". Assignments have different kinds of functions in learning situations: in some contexts they are meant to test the individual skills that students need to pass an exam. But more often they are important elements in evaluating learning goals in general.

Assignments can also have a behaviouristic design, in order for students to practice very simple procedures and standards, e.g. spelling and tables. Assignments can also address a pre-designed problem, for example: "A school yard is being resurfaced and you must estimate how much it will take to do this work if the school yard is 60 metres long and 50 metres wide". Using this example, the students have to construct knowledge in order to simulate a solution. Finally, assignments can be based on student's real-world experience: "Calculate how many litres of paint you need to paint the school yard. Afterwards you have to paint the school yard in order to see if your calculation is correct." Or: "You are planning to go to London with your class. Make a travel plan, and estimate your needs and make a budget". Prototypical situations like this last-mentioned assignment are defined by focusing on a situation that the students can realistically expect to face in life. These situations are relevant subject matter, as they form or simulate meaningful practice within the subject knowledge. There is a questioning and reflection on how prototypical situations can reflect subject-specific points of view on real-world problems (Bundgaard, Misfeldt & Hetmar 2011).

In practice the outcome of student work with assignments of this character will always relate to how the learning environment is planned: how instructions are given by the teacher, which ICT resources are available, and which everyday practices and collaborative routines exist in the classroom. Assignments can also be seen as a part of primary didactic questions. This is also the reason why I find it relevant to designate this as a specific research field: "Assignment Didactics". Assignments are part of a question on how activities can be designed to encourage learners to move into the higher parts of their zone of proximal development (Vygotsky 1980).

**Didactics Questions** 

# 1. Why? Key Questions Development of competences 4. When? Who?Where? Students collaborative potentials Assignments / scaffolding

Model 1 – A didactic model for assignments

The questions in a traditional didactics model are as follows:

- What content is thematised and which key competencies are addressed?
- What are the desired outcomes and learning goals of the learning activity?
- How should the activity be organised, and how do students access this knowledge?
- Who will work with whom, how and when?
- How will the activity be evaluated afterwards and will students have an influence on the response? (Slot 2010).

Even though the construction of assignments is closely related to these basic didactic questions, at the same time I place the concept of didactic reflection in this process as a key issue.

# Scaffolding in students' assignments

Students cannot simply be told to learn. They require significant scaffolding. The concept of scaffolding is normally understood as the support that a system can provide to students as they carry out different activities (Wood, Bruner & Ross 1976). This can take the form of structured or highly constrained tasks, or help systems that give students the possibility to learn more. Scaffolding plays an important role in the science of constructive learning and thinking. Support given can be in the form of suggestions or physical support to facilitate any kind of activity in or outside school (Collins 2005).

Students are often supposed to interact independently and individually with tasks and assignments, and it is therefore important to scaffold these processes in order to give students the opportunity to develop competencies and deepen learning (Davis & Miyake 2004, Sawyer 2005). Scaffolding must be aligned, otherwise students risk losing motivation, not only regarding the specific assignment or task sequence, but potentially to learn more in general. In order for students to feel motivated to learn, they must feel that they have the necessary prerequisites to achieve good results (Vygotsky 1978, Hauge 2010). Therefore, "built-in" scaffolding support is an important didactic grip. We also know from constructivist learning theory that scaffolding mostly consists of prompts and hints, which help students figure out tasks on their own, and that students need scaffolding to advance to higher levels. Finally, in effective learning, scaffolding is added and removed according to the needs of the learner (Sawyer 2005, Vygotsky 1980).

In an analysis on scaffolding in computer-based learning environments, Reiser makes it clear that most work on scaffolding has focused on structuring the task for students in order to make it easier for students to accomplish the task. But there is another important role for scaffolding: problematising the students' performance, or questioning the key concepts and strategies used during the task, so that students reflect more on their learning (Reiser 2004). My view of scaffolding in student assignments follows this broader interpretation. My aim is to discuss the criteria of student assignments and to establish a kind of design experiment concerning complex task sequences. It is also important to scaffold groups as well as individuals (Kolodner et al. 2003, Sawyer 2005). A typical built-in scaffolding procedure could be to provide students with the ability to solve simple problems while focusing on collaborative activities. When students

have conversations about task sequences it helps them to collaborate more effectively and also to understand the value of collaboration (Collins 2005).

# Forms of representation

With the development of technology, concepts known as "new literacy", "ICT literacy" and "multimodal literacy" have emerged. In a wider perspective, letters on paper are no longer the dominant form of representation that characterises education. Another issue is therefore how the integration of representation is implemented in assignments. From the results of multiple empirical studies, it is documented that various representations of subject matter are an important part of students' learning possibilities:

Students learn from all modes presented on the screen and around it – not only from what is written and said. I also look at how different ways in which modes are combined shapes learning. I show how multimodal texts offer different filters for understanding. They offer different potentials for engagement with a text: the point of entry, the possible paths through a text. (Jewitt 2008:7)

"Knowledge" can be transferred in many ways. It is meaningful for students if they are asked to reproduce and produce their knowledge, bringing in all kinds of representation, eg. simulations, texts, spoken word, graphs, models, etc. (Kress 2005, Jewitt 2010, Slot 2013). Nevertheless, most assignments in schools are constructed in order to support the students' construction of knowledge in oral or written representations, and only rarely in other representations (Slot 2010). As we design assignments for future schools, we must therefore include a broader approach when combining forms of representation in learning. The design of multimodal assignments assume more research in how new genres and formats can support the more scaffold-based teaching and progression in students' work. Furthermore, it is a challenge to produce multimodal activities that are both relevant to students' real lives and strongly related to the curriculum and subject matters (Jewitt 2008).

#### **Case studies**

#### Scaffolding in mother tongue education

In my study of the teachers' and students' use of three learning resources in the Danish classes of an upper secondary school, I demonstrated that student assignments are not fleshed out sufficiently in terms of the use of concepts, professional multi-modality and the participating process (Slot 2010). Many tasks in the 1G stage of upper secondary education are training tasks, and have

a strong focus on either the ability to report or to assess (Poulsen 2005). The analysis and discussion of what it means to move from a conceptual level (e.g. analysis and the concepts associated with this activity) to interpretation is often vaguely formulated in the tasks of the learning materials. Few student tasks frame the development of textual competence of the students, and they generally originate in the school context, where there is often an exam-oriented focus, while sample texts play a much more peripheral role.

The following assignments are taken from learning materials which I studied as part of my fieldwork. In my thesis I analysed didactic contexts and "proto-typical" assignments. Proto-typical means that these materials are typical of what is used in practice, by teachers and on the Internet. Well-designed assignments with a didactically-motivated scaffolding structure are the exception rather than the rule. The didactic question is how it will be possible to combine different kinds of design principles and how to make standards for scaffolding approaches.

Give your own examples of how turn-taking and opening can go wrong in ordinary conversation and on the web. Give examples of the opposite.

Give examples of how network communications create increased proximity. And give examples of how network communications create distance.

Find a communcation string on Facebook or on a forum (eg. YouTube) and make an analysis of the spoken and written language traits. Use the chart on page 83.

Discuss what happens to the dialogue that was carried out on the Internet instead of face to face.

Figure 1 – Turn-taking and opening (Poulsen 2005)

Figure 1 (above) shows a typical assignment in the subject of Danish in upper secondary school. The assignment does not explain how students are supposed to find out the most important task, or what knowledge is important in the task sequence. There is no "basis level" given to provide scaffolding for uncertain students at a basic conceptual level. There are no cognitive tools suggested to make progression visible to students, the representations used are receptive, and there is no multimodal production! The function of the Internet is simply as a "text-finding-machine". Students are asked to find all the text they need for analysing themselves, and there is no in-built support system for those students who are not capable of finding text themselves. It requires a reasonably high level of competence to choose texts for understanding communicative sequences.

In this assignment, this complex task is given to the students, but the risk is that they will find no exemplary text demonstrating "turn-taking" or "ordinary conversation". Finally, no collaborative activities are recommended in the assignment. Of course, there is a teacher and a learning environment to follow up with, but within the assignment itself, there is no scaffolding given. Some missed opportunities that scaffolding could have encouraged are: metacognition, cognitive tools, productive multimodality or finding out how to establish a fruitful collaborative work process.

This assignment design is typical for traditional assignments in upper secondary education in Denmark. Students are asked: "to explain", "to give examples"," to take turns" and "to discuss". The assignments do however miss situated practices in relevant communicative situations. Young students have lots of experience with communicative situations, but there is no scaffolding to appeal to knowledge related to everyday life, e.g. giving tasks related to real-life contexts and students pre-understanding of situated meaning. What I see is an abstract way of thinking, difficult task sequence with loss of transfer possibilities. There are many taxonomy levels, but it is not a given that it will help students to understand how to argue their case. There are no requirements to solve real-life problems or focus on students' speech acts, even though it would be relevant to work with students' use of language in everyday life. Students should instead deal with communication situations that are complex but realistic, so that they will learn communicative competency in real life. In studies of British educational materials for mother tongue language, students must work with themes and problems that are rooted in both the near contexts and also more formal situations. I have been interested in these learning resources in my research as good results are achieved with these activities in the UK. Unfortunately, the materials are not yet translated for use in a Danish context.

### Cognitive models as a scaffold

One way to build scaffolding into tasks is by applying in-built cognitive tools. Learning science research has demonstrated that cognitive tools are important for students, and that cognitive tools expand what students can learn (Reiser 2004). "Me me me dartboard" (see Figure 2) is a model that is intended to help students understand the consequences different kinds of speech modes have when learning in different contexts (Blake, Shortis & Powell 2011). Students work together on filling out the "student dartboard"; work that will systematise structures of sentences, slang expressions, and use of dialect as a part of an overall analysis of unique speech patterns and style.

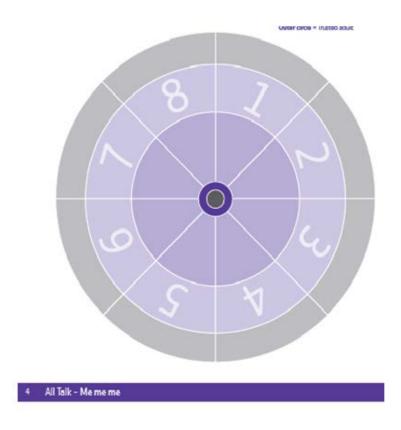


Figure 2: Me me me dartboard – Cognitive tools (All talk 2011)

The student dartboard scaffolds isolated elements of communication and helps students to structure and understand speech in concrete, specific, situated contexts (Berge 1999). The model helps systematise an analytic framework that relates to development of content with meaningful activity centred on the student's own language. Of course, students are supposed to display more advanced argumentation and communicative practices to demonstrate that there is a progression going on. As with many other resources in design for learning, it is necessary to pay attention to the fact that many of these simple cognitive models can be very limited and must be integrated within other didactic solutions. But despite the model's limitations and the dangers of the institutionalisation of the student's work process, it potentially helps students learn more about situated communication in a collaborative way. Being used within a didactic frame "Me me me dartboard" is a qualified assignment design for students "to think with" (Sawyer 2005).

#### Explicit learning goals as a form of scaffolding

Another problem I encountered with the assignments I examined whilst doing my fieldwork was that they are often based on a very abstract way of thinking about communication competence. Often a lot of responsibility is put on the students by instructing them to choose texts for analysis themselves. Another

IARTEM *e-Journal* Volume 7 No 1 Scaffolding students' assignments Marie Falkesgaard Slot 1-15

typical problem arises if tasks concerning what the student should learn are not clearly formulated.

The following assignment, "Family talk over time", is a good example of a task with quite an abstract theme but with a good scaffolding structure (see Figure 3). This type of assignment demands historical communicative knowledge of the student. An instructional text builds a preconception, which is important for students when they are supposed to construct new knowledge related to what they already know. Some film clips are contextualised in "Family talk over time", so that learning activities are scaffolded both historically and in a more modern perspective. The assignment also provides important scaffolding around learning goals, explicitly stating, "What will I learn"? It is very important that students are familiar with learning goals, requirements and assessment criteria. The learning goals in this assignment must be broken down by the teacher, because they do not relate to individual progression and differentiation.

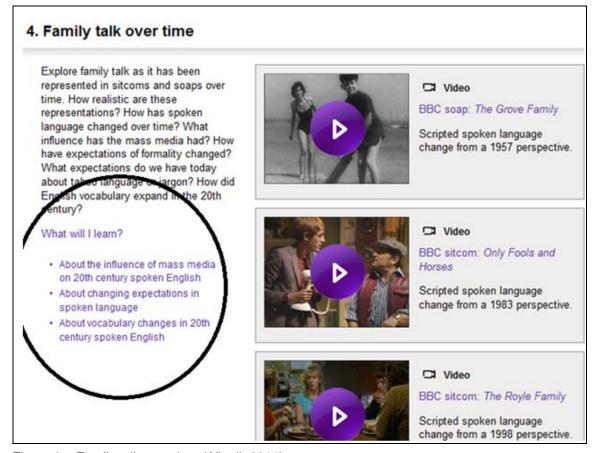


Figure 3 – Family talk over time (All talk 2011)

The way the assignment addresses concepts also provides scaffolding by constraining the students' repertoire of possibilities. Students are asked: "How realistic are these representations?" and "How has spoken language changed over time?" Since students are working here with different kinds of

representations, such as spoken words, pictures and sound, this sequence actually builds a basic level concept for "representation" and the term "spoken words". This means that students learn about different kinds of representations, and that they produce concepts even though they do not produce multimodal texts themselves.

There is more scaffolding in this assignment, where concepts, semiotic resources and learning goals are (even though kept in a more abstract and symbolic representation) scaffolded with a precise introduction, pre-chosen texts for analysis, focused questions, and progression or historical development built into these three clips.

# Multi-modality as an scaffolding principle

My last example shows how the Internet can function as a "multimodal text generator". The Internet can also be used as a reservoir for discussion or critique of potentials and barriers in the everyday use of social media. The development of subject-relevant content on a student's communicative action in terms of media and modalities are also presented in this assignment. The aim is for students to understand that different media and modalities correspond to a variety of oral communicative actions. In this assignment, one of the prototypical situations, the Facebook "Friend Request", is enacted, but with the scenario shifted from virtual space on Facebook to the front door of a friend. In this role-play activity, one person is called to the front door and greeted with: "Hey, should we be friends?" The person at the door asks just like on Facebook. "Answer now, answer now!" he shouts at the potential "friend" at the front door.

This task sequence is a guide for a number of prototypical situations where students, through replication, gestures and music, use their communication skills to contact and be contacted by someone. In this particular situation, they also experience how the "buddy request" operates in a virtual, asynchronous communication, and that this communicative approach is inappropriate in most other real-life situations. Scaffolded assignments like the Facebook role play help students to understand subject areas on a conceptual level before they are asked to analyse and also use more difficult ways of interpreting subject content.

Role-playing is, however, not always an easy activity in a classroom, even though the intention is to facilitate the replication of common and well-known situations. The goal is to show students how to behave in prototypical situations and how to acquire broader communicative competence by taking different kinds of roles.

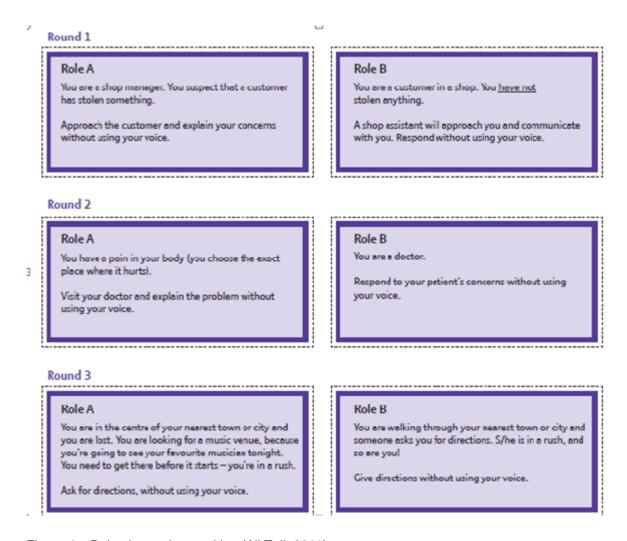


Figure 4 – Role play and turn taking (All Talk 2011)

These types of learning situations, where scaffolding is practiced, are very common in teachers' education programs. The novice is trained in situations where the professional is taking part in situations of quite complex communication. But a seventeen-year-old student does not have much experience being a doctor, a shopkeeper or maybe a thief! In the assignment shown in Figure 4, students are supposed to take part in role play activities where gesture is a learning goal. In the activities, the students are required to communicate without using their voices. I suggest here that some real-world situations can be very difficult to manage, even with the use of our voices, and that, in effect, what we see is a scaffolding structure that becomes a barrier for learning.

Therefore, assignments like these should be redefined and extended to include knowledge of multiple forms of representation in order to develop the knowledge of multimodal genres and to work with models of text analysis and joint production of texts in the classroom.

# Conclusion

This article has presented typical assignments used as learning materials in upper secondary education in the UK in order to discuss criteria of didactic principles in student assignments with a focus on scaffolding. Research shows clearly that students cannot only be told to learn about language or communication style. If students must tackle complex and difficult assignments, scaffolding is a very important component to be used to ensure a positive learning outcome. Moreover, significant scaffolding is required in order to transform learning situations from a traditional instructional learning setting to a standard that puts problem solving and multimodal use and ICT collaborative learning processes in front. In a learning resource landscape that has changed significantly, it becomes increasingly clear that many student assignments do not support the learning of the pupils. Many assignments studied do not provide scaffolding. My studies of learning materials have shown that scaffolding in student assignments should be cognitively-based, multimodal and give the students an opportunity to collaborate on a variety of platforms.

In the humanities the textbook is still the primary source for learning, while in science and mathematics learning resources are increasingly web 2.0-based and have many distributors and media platforms. There is every reason for the humanities to make increasing use of more exacting resources. With the use of free digital resources the teacher can not only design learning resources for students him- or herself, but can also focus on the opportunities of differentiation and progression, and not just the possibility of creating a multimodal expression which is both aesthetic and personal. In this design work, the teacher's didactic resource skills are essential for success.

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- IARTEM *e-Journal* Volume 7 No 1 Scaffolding students' assignments Marie Falkesgaard Slot 1-15

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