

Some Considerations about providing Feedback and Structure to Help Children to Learn Geography

Joop VAN DER SCHEE¹

VU University Amsterdam, THE NETHERLANDS

Abstract

In 2009 Hattie presented his intriguing book 'Visible Learning', the result of 15 years' research and syntheses over 800 meta-analyses relating to the factors that influence achievement of school-aged students. It builds a story about the power of teachers and the importance of feedback and structure. The question is, however: How do we realise this in the domain specific context of geography? After some information about 'Visible Learning' and some remarks about geography teaching, this article describes two small experiments in which student teachers trained students' learning abilities using feedback respectively structure.

Keywords: structure, feedback, achievements, deep learning, secondary geography teaching

Visible Learning

Most teachers work very hard. In classrooms they are busy keeping students engaged in listening and making assignments. When students are not noisy or overtly bored, some teachers think that the lessons are not bad at all. If most students focus on their tasks or ask one or more a questions many teachers think that the students are learning. However, how do we know? Nuthall (2005: 916) states that 'In most teachers' minds, the criteria for successful learning are the same as the criteria for successful classroom management'. Small classes and good facilities are also often mentioned by educators in discussions about factors for successful learning. But are these really important factors?

Questions about leaning are rarely easy to answer. Since the work of Hattie (2009), we have at least some answers. Hattie has written a fascinating book about what he

¹ Prof. dr. In Geography Education at Center for Educational Training, Assessment and Research (CETAR), Faculty of Psychology and Education, VU University Amsterdam, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands. E-mail: j.a.vander.schee [at] vu.nl

found in 800 meta-analyses about student achievement. The book does not pay attention to attitudes; behaviour or citizenship, so it only tells us a part of the story education is all about. And, of course, there are multiple meanings of achievement. Most tests used in the studies that were included in Hattie's meta-analyses are effective at measuring learning basic knowledge and skills (surface learning), but are not always effective at measuring deeper learning. In addition, one of the problems of meta-analysis is that no two studies are the same. A further criticism is that the findings of the meta-analysis are based on studies from the past and "the future is not so bound by what worked yesterday" as Hattie (2009: 10) frankly admits. Nevertheless, Hattie's review of educational research is useful in the way that it helps us think about teaching and learning. It shows us which factors seem to be important when you want to improve achievement in basic knowledge and skills. Hattie does not count small effects. He argues that there should be an effect size of 0.40 to begin discussion about what we can aim for if we want to see students change. In most cases introducing an innovation is better than its absence, but the question is does it really make a difference? An effect size of 0.40 is called the hinge-point.

The title of the book is 'Visible Learning' and Hattie (2009: 25) explains: "What is most important is that teaching is visible to the student, and that the learning is visible to the teacher. The more the student becomes the teacher, and the more the teacher becomes the learner, then the more successful are the outcomes".

This article is not the place to present the whole story of 'Visible Learning'; you just have to read it yourself if you have not done it yet, so let us end our tale about the book with the description of some important outcomes. It will be no surprise that active and guided instruction is much more effective than unguided, facilitative instruction. More surprising will be that class size rarely has a direct effect on outcomes (see Figure 1). However, working conditions like class size may have indirect effects on student achievements.

Teaching	effect size (d)
Quality of teaching	0.77
Reciprocal teaching	0.74
Teacher-student relationships	0.72
Providing feedback	0.72
Teaching student self-verbalization	0.67
Meta-cognition strategies	0.67
Direct instruction	0.59
Mastery learning	0.57
Working Conditions	

Within-class grouping	0.28
Adding more finances	0.23
Reducing class size	0.21
Ability grouping	0.11

Figure 1.

Effect sizes of 0.10 or more from teaching or working conditions (Hattie, 2009: 244)

As Figure 1 shows, the quality of teaching, reciprocal teaching, teacher-student relationships and providing feedback are very important. As Hattie “(2009, 245) concludes: “It is not a particular method, nor a particular script, that makes the difference; it is attending to personalizing the learning, getting greater precision about how students are progressing in this learning, and ensuring professional learning of the teachers about how and when to provide different or more effective strategies for teaching and learning”.

Many teachers and students see a schoolbook as a mountain of knowledge that has to be overcome. Climbing the mountain is the aim for them and they do not focus on what climbing the mountain gives to them in terms of views or skills. The aim of teaching and learning is not to finish the schoolbook, but to enrich the quality of life. The schoolbook is just one of the tools. Learning strategies can be very helpful for students. They can assist them in reducing their cognitive load. The message of Hattie is that teachers should talk with their students, give them feedback and help them to find their way. This message can also be found in publications of general educators like Simons, Linden & Duffy (2000) as well as in publications of geography educators like Lambert & Morgan (2010). A good teacher is an adaptive learning expert. For teachers as well as for students, prior knowledge is sometimes helpful, but can and sometimes stand in the way of learning something new. Important is to set reasonable and challenging goals, to map prior knowledge, to supply feedback and to have an open mind.

Geography Teaching

Geography educators are concerned with how people come to gain geographic knowledge, understand the applications of knowledge, and develop their own structure of geography science (Stoltman & De Chano, 2003:120). The content of the discipline geography is an important issue. Although this content is not always given enough attention, it is not the only issue that is important in teacher training. The task of geography teachers is to transfer the content from the discipline in such a way that students can engage in constructing meaningful knowledge, skills and ideas using geography. This requires content knowledge and process knowledge. In line with what Hattie and others say, teachers as engaged professionals, structure and feedback are key words in this transfer process.

However, there is no such thing as a guarantee for a successful transfer. Some students are not motivated for geography. No teacher can make a student learn what he or she does not want to learn. Starting teachers are often disappointed when his or her

enthusiasm for the subject does not evoke a similar response in geography classes (Graves, 1984: 145). Motivation is one issue, differentiation is another. What we teach in geography is sometimes simple and often very complex and what is simple or complex for one student is not always simple or complex for another student. Students have different starting positions, different misconceptions and different difficulties with integrating new knowledge. 'All students are equal, but no one is the same', was the slogan of the secondary school where I used to work. Food for thought.

However, saying all this is easier than to find solutions how to work with a geography class full of students.

There are promising initiatives to make good steps forward. International journals like the European Journal of Geography, International Research in Geographical and Environmental Education, the Journal of Geography in Higher Education, and the Review of International Geographical Education Online are good resources to get more information about research and development in geography education. To give an example, the study of Reinfried, Aeschbacher & Rottermann (2012) shows that students' misconceptions of the greenhouse effect are difficult to change but that special learning materials help to stimulate conceptual change. The special learning materials consisted of worksheets and experiments to help students think. Main characteristics of the teaching approach were a) the problem started with student's prior knowledge; b) the content was reduced in such a way that only key ideas of the concept to be learned were presented using analogies; and c) asking questions, experimenting, feedback and discussion alternated.

Some of these characteristics can also be found in the work of Leat (1998). Leat and others developed successfully motivating and challenging strategies for geography. The secret of the success of Leat's Thinking Through Geography strategies is that they help teachers to move away from a view that geography is a load of content to be delivered. Geography is one of the subjects to help students "think, ask questions, be surprised, and as a consequence make teachers think hard, ask questions and be surprised" (Nicols & Leat, 2001).

Too often geography is still thousands miles wide but not very deep. Reinfried, Leat and others choose another route that seems more promising in helping students to survive in a fast changing world. It is a strategy that is more than just methodology. Reinfried et al. (2012) state: "Thus, teaching success is no longer primarily attributed to the form of methodology applied or the scripts for actions used in the classroom. What is far more important is the question: To what extent does teaching stimulate focused in-depth learning processes in the learners?" In-depth learning and deep learning are words that also can be found in other publications in the field of geography education today. In his dissertation, Favier (2011; Favier & Van der Schee, 2012) discusses the design of geography lessons with GIS and concludes that, in order to be effective, teachers should not only focus on the technology, but especially pay more attention to the question how they can transform the subject matter so that it becomes accessible for students, and the question how they can help students structure their thinking about the subject. Students need a lot of guidance to engage in deep geographic learning. Providing good guidance

is a difficult task, and teachers could often use some help. We see the same in the discussion regarding fieldwork. Oost, De Vries & Van der Schee (2011) describe that fieldwork is often done in a traditional way and not well integrated in the curriculum. Well integrated enquiry driven fieldwork with more dialogues and reflection can help to achieve a deep learning, because it makes students more conscious of theory and practice and helps them to regulate their learning processes.

In line with the research and development projects mentioned above, a couple of student teachers of the Center for Training, Assessment and Research of VU University in Amsterdam, the Netherlands, investigated how they could improve their geography teaching. In their experiments, they focused on the effects of providing feedback and structure. A summary of their experiments is reported below.

A Feedback Experiment

After getting an unsatisfactory mark for his geography test, a student in secondary education responded: “How is that possible? I worked hard but I failed!” This student learned the facts and definitions in his geography book, but was not able to answer questions that require geographic reasoning. Students like this need feedback about the test aims, test structure, and test results, otherwise they will face the same problem at the next test. Hattie & Timperley (2007) wrote that: “It is difficult to document the frequency of feedback in classrooms except to note that is low” and “when feedback is combined with effective instruction in classrooms, it can be very powerful in enhancing learning”. Confronted with the problem of poor feedback after tests in their schools and studying literature about feedback like the contribution of Hattie & Timperley, a group of student teachers from different Dutch secondary schools investigated the effect of feedback on achievement as part of their teacher training programme. One of the student teachers selected in her secondary school two upper secondary geography classes (average age 16 years) and for each class two geography tests which were part of the regular curriculum. One class was assigned to be the experimental group, the other one to be the control group. After the first test the teacher returned the scores of the test to the students in both classes with information about the number of points in different categories: knowledge, comprehension and application based on Bloom’s taxonomy. During the lessons that followed after the first test, the geography teacher gave extra attention to the categories that had a low score in the first test. The teacher gave this extra attention in the experimental class but not in the control class. The proof of the pudding was a second geography test. In the experimental class there was a progression in the categories of comprehension and application between the first and the second test. The average score in the experiment group (=16) was 6.1 out of 10 at the first test and 6.7 out of 10 at the second test where a score of 10 out of 10 is the maximum. In the control group (N=12) the average score was 5.9 out of 10 at the first test and 5.8 out of 10 at the second test. Although the selection of the students was not at random and the number of participating students is far too small to draw conclusions, both teacher and students became involved in a good discussion about the aim and content of the geography learning process as well as the test items used and the importance of feedback. As one of the teachers said: “Thanks to this feedback instrument we and our students get more grip on the situation and that is good for all of us” (Bakkes, 2012). In

this school a group of teachers from different disciplines got involved in a discussion about tests, feedback and learning core issues in each discipline. A promising start. However, more specific information about how the geography teacher stimulated higher order thinking skills should be given to help other (geography) teachers that are in need of good practices. Giving feedback on what can be done better is one thing, helping students to improve their learning is a second step.

A Structure Experiment

A second experiment may help us to think about learning processes in geography education as it focused on the effects of training in geographical thinking. Two geography student teachers (Faber & Haaring, 2012) assumed that students themselves can have a positive effect on their geography learning process by training the use of geographic key questions. The IGU International Charter in Geographical Education (Haubrich, 1992) has a section dealing with questions and concepts in geography. In this section six questions are formulated (see Figure 2). The IGU Charter states that “Pursuing the answers to these questions necessitates investigating the location, situation, interaction, spatial distribution, and differentiation of phenomena on earth. Explanations of current situations come from both historical and contemporary sources. Trends can be identified which indicate possible future developments” and “Geography is concerned with human - environment interactions in the context of specific places and locations”.

Geographers ask the following questions:

1. Where is it?
2. What is it like?
3. Why is it there?
4. How did it happen?
5. What impacts does it have?
6. How should it be managed for the mutual benefit of humanity and the natural environment?

Figure 2.

Questions geographers ask (Haubrich, 1992)

A small experiment was organised to see whether training in the use of geographic questions has an effect on the questions the students ask. The two student teachers were employed in different schools. Each of them selected a lower secondary geography class with 12-13 year old students. The research design consisted of a pre test, a training of 5 geography lessons and a post test. The pre test and the post test were exactly the same. The test was not a knowledge test but a special assignment, see Figure 3.

Write your name on the sheet of paper.

Write down 5 questions that can be asked in the next geography test.

Work in groups of 4 students.

Compare your 5 questions with the questions of the other students in your group.

Decide what the best question is of each student in your group.

Decide what the best overall question is in your group.

Figure 3.

The test assignment

The training included the six geographic questions written in slightly more simple language than in Figure 2 and provided with examples. At geographic question 4: "What impacts does it have?" the example was: "What are the consequences of big differences between poor and rich people?" After the pre test the students received the six questions including the set of examples. In addition, in every geography lesson between the pre test and the post test some time was given to a discussion of the core content of the lesson using the six geographic questions. In this compact discussion with the whole class, students were challenged to structure and rethink the main issues of the geography lesson and feedback was given by the teacher and classmates. All questions posed by the students in the pre test and post test assignment were collected and analysed. The results show that in the pre test the number of 'Where is it?' and 'What is it?' questions was very dominant (95% of the questions were in these categories in one class and even 98% in the other class), but in the post test the distribution over the six different geographical was better (66% and 58% of the questions were in the categories 'Where is it?' and 'What is it?'). Interviews with a group of students after the post test showed that the training in asking geographic questions was more helpful for students that were not performing well in geography than for those who were good in geography. Both student teachers advise to continue research in this field because they think that it is worthwhile to practice the explicit use of geographic questions on a regular basis. It gives the (weaker) students more structure and it can support deep learning. This extensive training is in line with what Hattie (2009) and Nuthall (2005) write about spaced and mass practice: not more time on task, but the frequency of different opportunities can make a difference. That should not be drill and practice but a continued dialogue between teacher and students about key issues and concepts in geography.

Final Remarks

Geography is a brilliant and fascinating subject but it covers a very broad and complex area. Even if the hours of geography in schools would be ten times more than it is now, that would not be enough to cover the whole subject. Not to cover more content is the challenge for geography teachers, but to bring about a change in students' thinking. Every day will bring new and more information about our changing planet. Geography teachers should provide students with the tools (knowledge, skills and attitudes) to

discover our planet earth and think about it. Teachers can help to structure information, to evaluate situations and to be preparing to make decisions, giving feedback and asking questions. First of all the teacher's task is to become aware of the students' realities. Starting from there the teacher can offer signposts and stepping stones and even to walk part of the way together with his students in the hope that they will be well equipped to go on further alone or with others.

References

- Bakkes, C. (2012) Feedback bij aardrijkskunde: inzicht en motivatie. Praktijkonderzoekverslag lerarenopleiding. Amsterdam: VU University.
- Faber, J. & Haaring, L. (2012) Vragend leren. Praktijkonderzoekverslag lerarenopleiding. Amsterdam: VU University.
- Favier, T. (2011) *Geographic Information Systems in inquiry-based secondary geography education. Theory and practice*. Amsterdam: VU University.
- Favier, T. & Schee, J. van der (2012) Exploring the characteristics of an optimal design for inquiry-based geography education with Geographic Information Systems. *Computers and Education*, 58, 666-677.
- Graves, N. (1984) *Geography in Education*. London: Heinemann Educational Books.
- Hattie, J. (2009) *Visible learning. A synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.
- Haubrich, H. (1992) *International Charter on Geographical Education*. Nürnberg: IGU Commission on Geographical Education.
- Hattie, J. & Timperley, H. (2007) The Power of Feedback. *Review of Educational Research* 77 (1), 81-112. DOI: 10.3102/003465430298487.
- Lambert, D. & Morgan, J. (2010) *Teaching Geography 11-18, a conceptual approach*. Maidenhead: Mc Graw Hill.
- Leat, D. (1998) *Thinking Through Geography*. Cambridge: Kington Publishers.
- Nicols, A. & Leat, D. (2001) *More Thinking Through Geography*. Cambridge: Kington Publishers.
- Nuthall, G.A. (2005) The cultural myths of and realities of classroom teaching and learning: a personal journey. *Teachers College Record*, 107 (5), 895-934.
- Oost, K., Vries, B. de & Schee, J. van der (2011) Enquiry-driven fieldwork as a rich and powerful teaching strategy – school practices in secondary geography education in the Netherlands. *International Research in Geographical and Environmental Education*, 20 (4), 309-325.
- Reinfried, S. , Aeschbacher, U. & Rottermann, B. (2012). Improving students'
-

conceptual understanding of the greenhouse effect using theory-based materials that promote deep learning. *International Research in Geographical and Environmental Education*, 21 (2), 155-178.

Simons, R.J., Linden, J. van der & Duffy, T. (2000) *New Learning*. Dordrecht: Kluwer Academic Publishers.

Stoltman, J. & DeChano, L. (2003) Continuity and change in geography education: Learning and teaching. In R. Gerber (ed) *International Handbook on Geographical Education*, pp. 115-137. Dordrecht: Kluwer Academic Publishers.

Van der Schee, J., Vakan, L. & Leat, D. (2006) Effects of the Use of Thinking Through Geography Strategies. *International Research in Geographical and Environmental Education* 15 (2), 115-12.

Biographical statements

Prof. dr. Joop van der Schee is special professor in Geography Education at the Center for Educational Training, Assessment and Research (CETAR), Faculty of Psychology and Education, VU University Amsterdam, the Netherlands. He is co-chair of the International Geographical Union Commission on Geographical Education. His main activities of research in geography in education are related to (digital) map skills and thinking strategies of students in secondary education. In addition, he is lecturer in human geography and involved in teacher training at university level.