

SINUS in Bavaria by Christoph Hammer

You have heard a talk by Manfred Prenzel about the conceptual basis of the SINUS-programmes in Germany. Now I would like to explain briefly how these ideas are translated into action in Bavaria. You certainly know, that the federal states (“Länder”) of Germany have the sovereign power to determine their educational systems. Thus the educational system in Bavaria differs a little bit from that – let’s say in Brandenburg and also the implementations of the programmes differ slightly in the different states of Germany. So I am talking about the situation in Bavaria only.

The implementation of SINUS was planned in three steps:

1. During the first five years a small number of schools tried to test whether the basic ideas of SINUS work well:
 - Modular structuring of the programme
 - Innovation through the cooperation of the teachers
 - Regional and supraregional coordination of experiences and results
 - Networking of schools

Manfred Prenzel explained these basic ideas in detail. My focus lies on the steps 2 and 3.

2. In the following four years we tried to spread our SINUS concepts more widely. The results worked out well. During this step, we in Bavaria didn’t enlarge the school sets like other German states (“Länder”) but we created smaller units consisting of two or three adjacent schools. These “school-groups” were coached by two coordinators, who were in charge of the implementation and documentation of the desired processes. I will explain these details later.
3. This way of spreading SINUS seemed to be successful. That’s why we have continued with our form of applying SINUS programme ever since, even after the official programme ended. The only thing I regret is: I was not able to convince the Ministry of Education to offer this concept of in-service training permanently to Bavarian teachers. So I am curious how long this work can be continued.

Now let me explain what our training looks like.

The coordinators arrange meetings, four afternoons and a whole day per year. These meetings take place at one of the schools which are involved. Attendance is voluntary, but the main precondition is that a majority of mathematics or science teachers should take part in them.

The typical workflow of such an afternoon could be as follows:

At first the coordinators give an input concerning one aspect of the modules explained by Manfred Prenzel. They present good examples from their own practice. Afterwards the teachers try to transfer the ideas which have been presented into their own teaching. For this purpose we form school-spanning teams. Ideally, the teachers develop a definite plan of

a lesson that they will teach soon. The next meeting starts with reports and discussions about the benefits or problems of these lessons that they have just taught.

The all-day meetings take place once a year and are for all the teachers who are coached by the same coordinators. These events with about 100 participants include self-organized workshops and talks by well-known lecturers in teaching methods or scientists.

The teachers' feedback on both sorts of events is very encouraging. We are not only proud of the positive results of the evaluations made by IPN but we are also proud of the "voting by feet", as we call it in German. All teachers voluntarily take part in this unique opportunity for further education for at least two years - most of them even much longer. By now we have reached about half of the secondary schools ("Realschulen" and "Gymnasien") in Bavaria.

Many of the teachers involved have pointed out that for them the most important advantage of their participation is the increased cooperation with their colleagues. They no longer just talk about difficult pupils but – more important – they talk about their lessons.

The coordinators' expertise and commitment are the most important crucial factor. The coordinators' teaching load is reduced by four lessons. This means they have to teach less. But they are responsible for the quality of the development processes at the participating schools. They have to structure the meetings; they have to document the work achieved and they have to manage the funds available.

The coordinators are coached on their part by the "Landeskoordinator" who takes care of the advanced training of the coordinators. This chief coordinator is in charge of the overall organisation of the programme and he has to improve the programme and promote public relations. This was my job for 8 years until 2008. We worked out and published two books with useful suggestions for teachers and we designed a webpage where you can get further information and pdf-versions of the booklets which you can order also for free (www.sinus-bayern.de).

Needless to say, we are facing several problems two of them I have picked out:

1. The workload of our teachers is high; so we can't burden them too much with additional tasks.
2. Change-processes take a long time and don't succeed straight away. The participants have to suffer setbacks now and then.

This is why the coordinators have to encourage, support and motivate the participants a lot.

Finally, let me give you two examples of how to start interesting lessons in physics (maybe they fit exactly to the concept of inquiry based teaching where Mind the Gap aims to):

The first example is a confrontation with a challenging question, which helps to get a better understanding of physics. Perhaps you are interested in criteria for good tasks which we have elaborated in the context of module 1

A really good question means...

1. Every pupil is able to contribute substantially to solve the problem (“lead in to the topic”).
2. The problem aims at an important physical topic. (“core of the matter”)
3. It’s possible to start an intellectual discovery on this theme. (“starting point”)

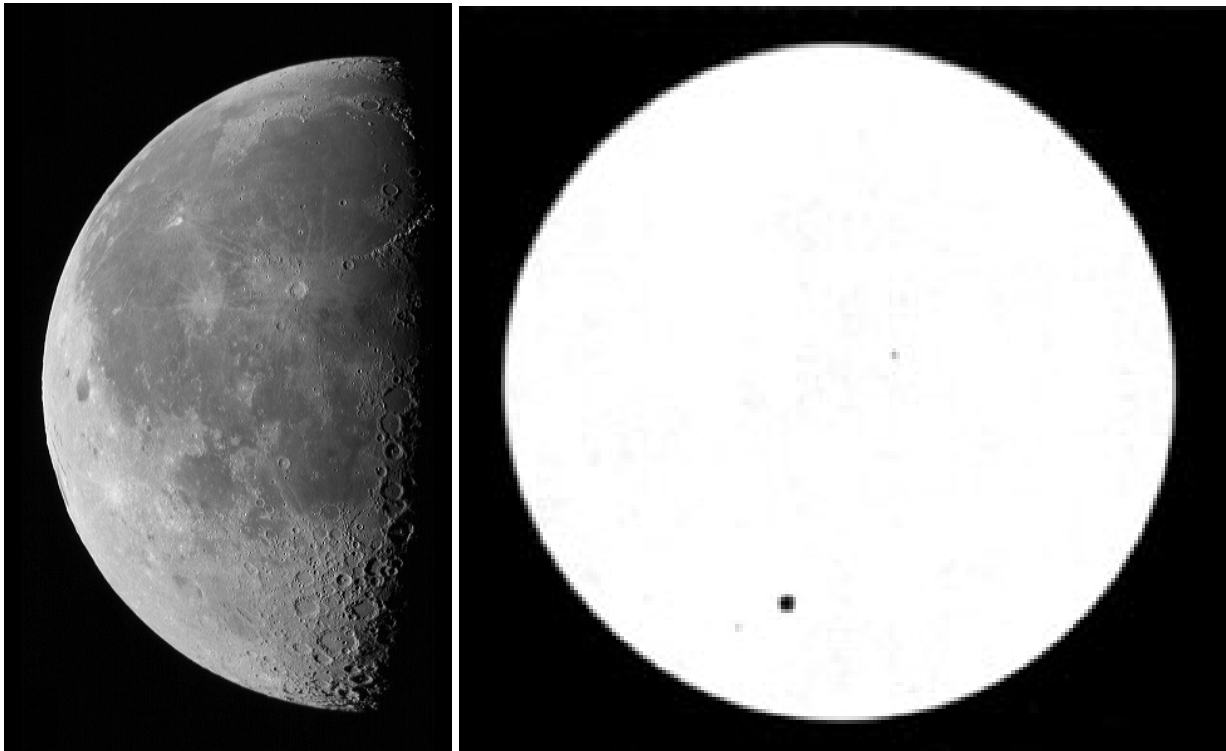
Here is the example:

Does a heavier skier have an advantage in a downhill race?

This challenging question can lead you through several weeks of lively discussions and inspiring work in the classroom as well as at home. In addition it aims at a curricular topic (friction) which can be very boring.

The second example focuses on the question: How does visual perception work?

Here you have pictures of the sun and of the moon. The point could be to discuss, that you can see objects which shine themselves and you can see objects which are illuminated.



My example shows another important aspect: Both the sun and the moon are almost spheres, as you know. But only the moon looks like a sphere. Why that?

The answer is: Visual perception depends on light and on shadow.

To demonstrate this you could add the following experience: Take a ball lamp illuminated at first from the side – you imagine a sphere because you can see both light and shadow. Now increase the brightness of the lamp with the dimmer. More and more shadow disappears and you imagine a bright disk. It’s the same with the sun and the moon.

If you haven’t thought about this up to now, you will learn about a fundamental aspect of visual perception.

May I test you, please, whether you have understood this physical principle?

Look at this picture. What do you see?



Perhaps a little wall upon a small hill?

Now rotate the picture and you see what the picture looked like when it was taken.



The reason for this amazing effect is that visual perception depends on light and on shadow. Now rotate the picture again and you know exactly what you see.

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