

Learning Strategies for Teachers

Lea Solty und Claas Wegner

What are learning strategies really and what forms of them are there?

In the education system of the Federal Republic of Germany, as learners become older, an increased degree of autonomy and self initiative in their learning process is expected of them in order to examine learning material, to understand and process the contents of information. Efficient acquisition of knowledge both in and outside of lessons can only then be successful if pupils have learned skills that initiate, guide and oversee autonomous searching for, processing and memorizing of information. These learning techniques are grouped together in teaching – learning research under the title learning strategies.

Current educational and psychological research is increasingly occupied with the topic of how pupils generally learn and what learning techniques they should be taught to enable effective, autonomous learning. Here we mention briefly the three more recent German-language learning strategies inventories: the “Kieler Lernstrategieinventar (KSI)” (Kiel Learning Strategy Inventory) of Heyn, Baumert, Köller; the “Inventar zur Erfassung von Lernstrategien im Studium (LIST)” (Inventory for the Compilation of Learning Strategies in University Studies) by Wild, Schiefel and the Motivated Strategies for Learning Questionnaire (MSLQ) by Nenninger (cf. Baumert, Köller, 1996, p.138f.). The objective is not only to comprehend how learning functions as a process but rather to find out which skills are accompanied by favourable learning achievements. Attention is increasingly being turned to the active learner and the basics of self-directed learning. “Especially in the case of attempts to organize learning activity in a way that encourages development, the necessity of both a differentiated consideration of the learning strategies that are available to learners and also a differentiated determination and planning of the relevant conditions for acquisition and development become apparent” (Lompscher, 1996, p.1). Because of the present strong interest on the part of schools in learning strategies, they will be considered in this chapter and assistance as to methods for their implementation will be given.

The term learning strategies does not denote a standardized scientific concept. On the contrary, various constructs of very different research groups are gathered together in this term. To describe learning strategies, different viewpoints are drawn on such as the division into primary and support strategies according to Dansereau (1978), the differentiation between general and specific strategies according to Klauer (1988), the description of learning strategies according to their function for processing information according to Weinstein/Mayer (1986) and the differentiation between micro and macrostrategies according to Sternberg (1988). Corresponding to the large number of concepts, the following representation is based on the description of learning strategies according to Weinstein and Mayer. According to Mandl and Friedrich, they represent “Action sequences to achievement of a learning objective” (Friedrich, Mandl, 1992, p.6). Whereas Lompscher places the following emphasis: “Learning strategies are more or less complex, to a varying degree generalized or generalizable, consciously or unconsciously implemented procedures to attain learning objectives and to cope with learning standard requirements” (Lompscher, 1996, S.2), Weinstein and Mayer understand learning strategies generally as all internal and external behaviour with which learners try to influence different aspects of their own learning such as motivation, selection and processing of information (cf. Friedrich, Mandl, 1992, p.7). Researchers do not agree on whether use of strategy can only be said to exist in the case of conscious decisions or whether habitual action sequences also count.

Strategies are therefore understood as objective-oriented procedures that are at first implemented consciously but gradually become automatic. The following representation of learning strategies is based on this definition.

Fundamentally the following classifications of learning strategies are differentiated (cf. Mandl und Friedrich, Handbuch Lernstrategien, 2006):

- Organizational strategies (p.117 –150)

- Revision strategies (p.101-116)
- Elaboration strategies (p.27-100)
- Monitoring strategies (p.151-186)
- Cooperation strategies (p.261-296)
- Motivational and emotional strategies (p.223-260)

In the following discourse the different classifications of learning strategies will be presented and their possible implementation in teaching elucidated. It must, however, be noted in advance that this is only a small selection of the repertoire of methods and that numerous others may be found. In addition, the types of strategies are merely presented, the author is well aware that they must be adapted to the individual teaching situation.

1. Organizational strategies

Those learning strategies are seen as organizational strategies that have as their objective the organization of new knowledge by recognizing the existing connections between the knowledge elements (cf. Friedrich, Mandl, 2006, p.4). G.A. Miller was the first to describe them in 1956. Here complex information is often transformed into a form that is easier to process, as the capacity of the working memory is limited (cf. Schröder-Naef, 2002, p.44). Accordingly, important facts and lines of argumentation are identified or depicted visually in sketches. Further, deeper understanding of the new subject matter can be achieved in this way. By using organizational strategies, details of information are combined and grouped. This type of strategy is important for pupils' learning activity for the following reasons. These strategies help them with the organization of large amounts of subject matter by dividing the learning content into suitable learning sequences. For visual learner types the depiction of facts in a mind map, for example, can help to store the single connections better in the long-term memory. In addition, the use of marking/highlighting and reading techniques can help the learner in many fields. It must be borne in mind that a class is composed of many different pupil personalities, among whom the under-achiever, for example, often has the problem that he is not able to structure the knowledge he already has and to retrieve it appropriately in a learning situation. Pupils with problems in reading and spelling may also slowly improve their inability by using reading and marking/highlighting techniques and those with autistic traits can be encouraged in their organizational talent. These types of pupils benefit from acquiring organizational strategies. In addition, they relieve teachers of work since, by offering the pupils methods of organization, they can provide them with material that assists them to confront their learning difficulties autonomously.

As examples for implementation in teaching practice the following procedures can be proposed here such as strategies of external visualization (mind map), summary of texts and the reading technique SQ3R method.

TIPs:

- Subject matter can, with forms of visualization (mind map), be made clearer and put into context of meaning.
- Material that has been systematized (by text marking/highlighting) is easier to understand and to retrieve later.
- Ideas can be noted down at any time and any place and have a clear structure that may be helpful later when making a plan (spontaneous use of mind maps).
- An effective reading technique (such as the SQ3R method) is not only important for German lessons but also in other subjects for all other learning.

2. Revision strategies

On a single day at school, a pupil is confronted with a large amount of information. "Only a small amount of subject matter is anchored in the long-term memory by a single information impulse. The more detailed the subject matter is, the more important the quick revision of

what has just been learned as a pre-condition for remembering” (Konrad,1999,p.85). The significance of revision of learning content was first investigated by Atkinson and Shiffrin (1968) and thus moved into the focus of the academic world (cf.Friedrich, Mandl,1992,p.11). Active repetition and reciting may help with this learning strategy to store particular facts in the long-term memory. As well as the classic learning of word or vocabulary lists, formulae (Saprobien index), rules (Hardy-Weinberg law), tables (structure formulae of amino acids) and certain correlations (influence of temperature on animals) can also be learned with memorizing techniques. These are just a few examples from the field of biology. This learning strategy may, however, be used for any subject or any learning activity (e.g. driving test questions). This learning strategy is helpful for all pupils and is almost automatically used for learning vocabulary and formulae. It is particularly useful for weaker pupils or pupils with dyslexia or autism spectrum disorder. These children often take a longer time and need more repetition phases to grasp new subject matter entirely. Under-achievers can also benefit from this style of learning, namely when they have to be re-introduced slowly to working on complex tasks for a longer time. Teachers expect this learning activity from their pupils and support them by giving them revision exercises for which the pupils have to return to things they have already learnt.

A useful technique for revising especially for vocabulary has proved to be the principle of learning with a learning card index. However, this can also easily be applied to non-language subjects for example by noting special terms in biology on one side and their meaning on the other side of the index card. As well as this learning method there are numerous other possibilities to make revision interesting for pupils. A learning poster can be designed by the pupils themselves to depict new subject matter for everybody in the classroom.

TIPs

- Include regular revision phases (monitoring the afore-mentioned homework) in lessons.
- With a card index each pupil can work on his individual weaknesses.
- Learning posters can be made by pupils alone or in a team. They should, however, hang in the classroom for a maximum of three weeks and can be made in interdisciplinary projects.
- Explain to the pupils how important systematic revision is, for example at home in order to have terms and formulae at one’s disposal and be able to follow the lessons.

3. Elaboration strategies

With all learning and knowledge-gaining processes there is the problem of integrating new knowledge into an existing, cognitive structure (cf.Friedrich,Mandl,2006,p.2). This form of learning is particularly suitable for incorporating newly acquired knowledge in an existing knowledge structure. Elaborative techniques, as van Dijk and Kintsch were the first to call them in 1983, encourage the understanding and remembering of new knowledge because they cause new information to be linked with existing knowledge. This sort of strategies are used when someone thinks up analogies and mnemonics for facts that have to be learned or links new knowledge to his previous knowledge or expresses it in his own words as for example gifted pupils do (cf.Schräder-Naef,2002,p.44). Therefore elaborative techniques encourage learning through understanding. Another group of elaborative techniques serves to memorize and remember insignificant and unstructured material. These are mnemo-techniques such as the method of places or the keyword method: they are useful for learning vocabulary or specialist terms off by heart.

Elaboration strategies encourage the user to learn complex correlations and so they can particularly support learning processes in gifted children, under-achievers and nerds. Teachers can promote the training of this strategy by offering exercises that require using knowledge and synthesis exercises.

Of all the numerous elaborative learning methods, only those are mentioned here that can be integrated well into practical teaching. These are for example procedures for activating

previous knowledge such as brainstorming or finding analogies or using notes and mnemotechnique.

TIPs:

- Open your lessons to spontaneous chains of association (brainstorming) by pupils
- Try to draw on vivid images from the pupils' environment to explain complex facts (activating previous knowledge, analogies)
- Instruct your pupils on how to organize their exercise books clearly (for example using the GÜTE formula)
- Introduce memory training strategies (like mnemotechnic verses) into your lessons, they are useful for remembering information
- Learning with rhymes and images is fun

4. Monitoring strategies

Effective learning requires the use of strategies that help to monitor one's own learning and thinking process. This kind of strategies is known as monitoring strategies and were first introduced by Borkowski, Pressley and O'Sullivan in 1985. Competent learners have this kind of tactics at their disposal to plan and oversee their own learning and thinking process, to check and to reflect on their results. That is why they are distinguished from cognitive strategies and called metacognitive strategies "as they operate, as it were, above cognitive processes" (Friedrich, Mandl, 2006,p.5) and serve to regulate one's own information-processing operation. Planning of a learning sequence includes setting out learning objectives (understanding the composition of the human eye) or formulating monitoring questions (what causes far-sightedness?). These techniques assist the learner to prepare a plan of action for further procedures. Monitoring techniques help to monitor one's own learning progress such as checking whether the information read has really been understood. And finally, there are also monitoring / regulation techniques that assist the learner to adapt his own learning activity to the requirements of the tasks, such as re-reading a difficult paragraph of a text. This learning strategy is directed more at experienced learners whose capacity for reflection is already well-developed. Younger pupils must first be prepared for this technique. Likewise the class clown type of pupil can, when given a task requiring monitoring strategies, concentrate better on the task and so the risk of his being distracted from learning by other activities is minimized. Dyslexic pupils can also be supported with this kind of strategies and gifted pupils are well served by a style of working that encourages structure and organization. With the help of these learning activities, the teacher guides pupils towards learning to be responsible for their own work and gives them an insight into structuring the working process.

The learning diary may be mentioned here as an example for use in practical teaching.

TIPs:

- Working on a task alone without help from anyone else promotes a child's self-confidence
- A learning diary can help children to reflect on their own learning process. Competence in reflection, which is tremendously important for children later in life, is encouraged in this way.
- Keeping a diary is well-suited to free work phases or weekly plan working
- Teachers can encourage and accompany pupils in developing their individual monitoring strategies.

5. Co-operation strategies

In present-day society, learning is often a cooperative process including social interaction. As early as 1977, Tough carried out the first research to prove the positive effect of working together on learning success in the case of adults.

The education server in North-Rhein-Westphalia gives the following definition of this form of learning arrangement: “Cooperative learning means that pupils assist each other in working and together achieve results. This takes place in partner or group work” (<http://www.learn-line.nrw.de/angebote/greenline/lernen/grund/gruende.html>, as of:3.9.2009). A fundamental pre-requisite for successful working in groups is the fulfilling of certain conditions. Above all, favourable learning conditions must be created. It is essential in this context to consider the organization of lessons so that the conditions of rooms and time promote a cooperative style of working. This means that it is for example only then a good idea to go on an exploration of a nearby biotope if the time plan renders it possible. During a ten-minute visit, children will not have the chance to identify characteristic animal and plant species. In addition, it depends on how a task is set whether it is better to work on it individually or in groups. Children should have the opportunity to use their cooperative abilities; these include taking part in discussions, reaching decisions, communication and conflict management. The teacher should, however, not withdraw completely but rather provide the children with learning aids to equip their tutorial-style learning environment. A decisive factor for effective group work is the size of the number of learners taking part. It should not be more than 3-4 pupils. A heterogeneous composition of the group has proved favourable, i.e. that high-achieving pupils and weaker pupils form a group together and can thus cooperate to assist each other. Furthermore, studies on learning results by Slavin in 1993 show that those pupils learn most that explain a subject on their own to another person. The listener does also benefit from an increase in what he knows but not as much as the member of his group doing the explaining. Likewise it could be proved that active participation in group work has a positive effect on what the learner is able to remember (cf.Huber,2006,p.263).

As Huber, however, notes, “when learning takes place in groups this does not necessarily mean that that the group members cooperate in learning” (Huber,2006,S.261). The natural learning situation in a class tends more to be influenced by competition between the learners. On the other hand, learning in groups is the normal situation in many arranged learning processes. Cooperative learning arrangements therefore depend very much on the learning group in which they are intended to be used. As well as the above-mentioned competition, exploitation of the nerds or the quiet and weak pupils can ensue. Cooperative forms of learning are beneficial for all groups of pupils, especially those pupils that tend to have the role of the outsider, such as for example quiet pupils, outsiders, children with ADHD disorders, can be integrated very well into lesson activities. Furthermore, the position of the star or very gifted pupils can be used by putting them into a group with weaker pupils. For teachers such forms of learning are ideal for handing over some of the responsibility for the learning process to the pupils and training their capacity for teamwork. In order to integrate this form of learning into lesson activity, a large variety of cooperative learning settings have been developed, two of which will be mentioned here. On the one hand the group puzzle will be mentioned as a cooperative learning activity and on the other hand use of a cooperative script such as the MURDER script.

TIPs

- Set tasks in such a way that they are suitable for cooperative working.
- Cooperative forms of learning require practice. Do not be discouraged by initial failures.
- Social cooperation benefits the atmosphere in the class and helps to prevent expecting too much from the pupils.
- The learning group must, with regard to its social behaviour, be able to test this kind of form of learning, otherwise preparatory exercises must be done first.

6. Motivational and emotional strategies

“The motivation to learn [...] is usually regarded as self-evidently a central condition of learning success” (Schiefele,Streblow,2006;p.232). Yet other factors such for example intelligence, previous knowledge or interest also play a decisive part. Rheinberg (2202) describes motivation as an activating orientation towards a targeted state that is seen as

positive (cf. Schiefele, Streblow, 2006, p.233). Here he assumes that the depth of this orientation influences the duration and intensity of the activity. "When applied to the context of school, this means that it depends on the degree of motivation for learning whether a pupil joins in a learning activity at all and for how long and how intensively he learns" (Schiefele, Streblow, 2006, p.233). Furthermore there is a differentiation between extrinsic and intrinsic motivation. Intrinsically motivated actions are carried out because they provide positive aspects of experience and are interesting, exciting or challenging for the learner, such as for example bringing live animals into lessons. In contrast, extrinsic actions have an instrumental function. They are carried out to gain positive consequences (e.g. praise from parents) or to avoid negative ones (e.g. reprimand from parents). For the learning process this means that people in situations where they are expected to achieve results strive to experience competence and proficiency in order to deal with a learning object with motivation and interest. Encouraging individual and thematic interest in pupils has become an important concern of current research (drawing on experience with pets etc). In particular high-ability pupils such as under-achievers and the gifted, but also those with less high achieving personalities such as pupils with autistic or borderline personality disorders can benefit from motivational and emotional learning strategies. Therefore some advice and observations relevant to this will be offered on how intrinsic learning motivation and interest on the part of the learners may be encouraged. Unlike the learning strategies presented above, it is not possible with this learning strategy to depict such obvious examples of application. Some basic approaches will be presented that should be considered in characteristic situations.

"An acknowledged objective of school education is to interest pupils in subject matter. One possible way of arousing interest is often considered to be offering what is to be learnt as attractively as possible, including variety and being entertaining and presenting unexpected, surprising questions or contents", such as a film extract or experiments the pupils did not anticipate (Schiefele, Streblow, 2006, p.238f.). As central pre-conditions for this, the desire for competence, self-determination and social integration are often mentioned. "The objective of encouraging intrinsic learning motivation and interest in a subject is to enable pupils to have positive experience while learning and is also to increase the personal value and the significance of what is being learned for them" (Schiefele, Streblow, 2006, p.239). In the following, ideas are offered of how these four main aspects of encouragement may be put into practice in schools.

The following interventions may contribute to strengthening confidence in one's abilities (awareness of competence). In this context, Streblow and Schiefele put forward the following points: extrinsic motivation of pupils (praise/reprimand), encouragement of active participation and of use of reference to real life, presentation of subject matter in a clear, structured and vivid way and also social support during appropriate tasks (cf. Schiefele, Streblow, 2006, p.240).

Pupil self-determination can be promoted by opening up freedom of choice and scope of action to them. Although the syllabus does not always allow for pupils to join in decision-making concerning what is to be taught, it is possible to permit pupils to choose how it is taught. This can be done as follows: enabling joint decision-making in lessons, increasing the scope for action, allowing self-assessment and linking with primary objectives.

In order to increase the feeling of social integration the following measures are applicable: use of teamwork and a teacher-pupil relationship based on partnership. Feasible approaches ensue from choosing methods together and in the sixth form nowadays from the centralized A-level examinations, which pupils and teachers work for as a team. In order to increase the subjective value of what is being learned, as well as satisfying the three basic desires, the following measures may be necessary: the learning objective must be clear and have personal significance, teachers should demonstrate their own interest in the topic (role model function), the emotional content of the topic should be increased, possibilities of practical use should be emphasized, the topic should be connected with "natural" interests and everyday life and finally, teachers should offer variety and innovation.

Here it should be noted that some of the above points are also directed at extrinsic motivation. It is true that, unlike its positive opposite number intrinsic motivation, this is often condemned but it is nonetheless definitely a component of learning at school.

TIPs

- Give pupils positive feedback about what they have achieved
- Try to convey the subject matter in as structured and vivid way as possible
- Give pupils the opportunity to decide how lessons should progress, e.g. in the form of project work
- Use cooperative forms of learning such as the group puzzle to improve the social structure of the class and so that pupils do not always work in the same groups.
- Demonstrate your own obvious interest in the topic, maybe your enthusiasm will be infectious.

Allow pupils to work as often as possible in a practical and self-organized way; in addition to experiments in the sciences, pupil-oriented tasks can be found for other subjects (e.g. school or class newspaper etc)

Conclusion

School is often called a place of learning, a place therefore where one learns to learn ("learning how to learn"). A central part of the know-how acquired while doing this is learning strategies. However, acquiring these has so far been a byproduct of school learning. In the conflict between optimization of imparting information and the development of learning competence, school education has decided in favour of the former.

"If learning strategies and competence in methods have the standing of key qualifications, [...], then they should also be developed systematically so that learners, when they leave school, have available to them a repertoire of learning strategies, which they can use consciously and relevant to the task and the situation" (Friedrich, Mandl, 2006, p.17). To reach this objective, the teaching of learning strategies must be organized systematically by the school and supported by teachers. The fact that school education takes place over a longer period of time and that a variety of subjects is taught there, which is advantageous for cross-disciplinary use of learning strategies, makes schools an ideal place for acquiring learning strategies. Therefore it is extremely important for teachers to examine this topic and to try to teach it to their pupils at as early a stage as possible. Only repeated practice of these learning techniques enables pupils to develop into good strategy users, who, according to Staub, are distinguished by their wide repertoire of techniques that they can select according to their objectives and the use of which they are able to adapt to changing requirements (cf. Staub, 2006, p.66).

Bibliography