Action- and productoriented second language acquisition

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In 2015 and 2016, approximately 420,000 children and young people under the age of 18 applied for asylum in Germany (Cf. Bundesamt für Migration und Flüchtlinge 2016/2017). Regardless of the outcomes of their applications, Germany will be faced with the task of protecting and integrating them into their society. This process does not only include the fulfilment of their basic needs, such as security and care, it also contains the development of concepts that provide various responses to the urgent question of how refugees, in particular young refugees who are in the midst of finding their identity, are able to deal with the balancing act between their emotionally-anchored cultural convictions and those demanded in the Western world.

These young people are confronted with a consumer-oriented society whose advantages they want to share, often without knowing the price that has to be paid in order to be a part of it.

For many of them, the dreams of an equal participation will not be fulfilled, which could result in repeated, frustrating experiences (Cf. Sieferle 2016, p.17f). According to Esser in 2006, the most fundamental problem of migrated families is in fact, that they share the same goals, for example economic well-being, but they mostly have low or moderate means which makes them less efficient in reaching them (Cf. Esser 2006 p.10). Therefore, it is necessary to know not only about their needs, wishes, abilities and knowledge, but also about their concept of the word education.

How can they be integrated into society as quickly as possible so that they can have opportunities for vocational training or work?

Since 2015, enormous efforts have been made in the field of education in order to give all refugees and migrants at least the basic range of linguistic integration in the shortest time possible. In order to get by in this complex new society, the acquisition of the local language is indisputably the most important qualification (Cf. Brückner et al. 2016, p. 32).

The acquisition of the language is thus not only an indispensable prerequisite for everyday communication, but also for all formal and informal educational processes. For many of the young refugees, this is an enormous problem: they have too little time to learn the language comprehensively, to familiarize themselves with the values and norms of our culture and, moreover, to achieve formal educational qualifications. Their motivational prerequisites have

not yet been taken into account in this mixture. Linguistic deficits have a particular impact on the opportunity to find employment if their mother tongue has little or no use in the labor market. Existing knowledge and skills, as well as previous professional experience, hardly bring any benefits to the labor market, if deficits in the local language prevent or hinder communication (Cf. Esser 2006 p.11).

For recently immigrated refugees, especially from families of low economic status, school education is perceived as an opportunity for social advancement. Accordingly, the initial motivation is high, which, however, decreases over time and over the course of assimilation, when the belief in their social ascent is lacking (Cf. Esser 2016, p.183).

But their perceived social class is not the only factor which is crucial for their future, but also the educational level of the migrated pupils, which is the foundation of any school-based integration. Math and science are prerequisites for professional prospects in Germany, as well as knowledge of the language. If one considers that many of the children and young people who have come to Germany in the last two years have had months or even years of flight and banishment in which education played no or only a marginal role, then it becomes clear that the students have an enormous task ahead of them.

If tens of thousands of young refugees can not obtain a certificate at the end of school because of their educational backgrounds, their deficient language skills and poor general education, this can lead to difficulties in improving their education. Therefore, it is expected that many of these pupils are going to remain in the support system of the state or are going to be employed in the low-wage sector. Schneider suspects that 2016 about 300.000 refugees will be working as clandestine workers and, therefore, could become victims of exploitation due to lacking work alternatives outside of the black market (Cf. Schneider/ Broockmann 2016).

This highly complex problem raises the following question: which concept of formal and informal educational institutions would be suitable to facilitate the process of integration and promote a minimum degree of social integration, as well as the satisfaction of the need for autonomy and competence (Cf. Krapp/ Ryan 2002, p. 72). Given the physical and psychological distress that some of these children may have experienced, seeking ways to give them a feeling of appreciation, of a strengthening of their self-esteem, and support of their language learning, there is a need for educational opportunities, particularly those of self-efficacy and resilience. A moderate level of action that is not only appropriate to the individual educational level, but which also offers scope for the inclusion of individual experiences, which is the basis for an integrative and value-oriented integration into the education system. These include educational

programs which, independent from the language, satisfy the need for competence, social proximity and independent action, and also creates a basic sense of accomplishment with the result of their efforts. This aspect is central, because the experiences of the youth in their host country play a decisive role in their future. An emotionally-positive educational experience can help young people in their efforts to overcome the hurdles of cultural and professional integration. Especially the feeling of being perceived and being recognized as having individual abilities is crucial for successful integration.

Language as the key to integration

Because the acquisition of language is a central element of successful integration, the question of suitable methods of language translation is of great importance, which is discussed thoroughly and, in part, controversially (Cf. Blossfeld et al. 2016, p. 185).

In particular, for older adolescents, another aspect plays a crucial role: They must learn not only the language and the basic cultural habits within a very short time, but also be able to master job-related concepts that are constitutive of an education. The pedagogical concept of learning a foreign language by including professionally-qualified content is not new. As early as the end of the 1960s in the Federal Republic and in the early 1970s, this concept was part of foreign language acquisition in the GDR. Under the term "Content-to-Language Integrated Learning" (CLIL), concepts for foreign-language immersive learning have been established in Europe and in recent years, in which different accenting content is fused with foreign language acquisition (Cf. Goethe Institut 2017, Sudhoff 2011).

Action-oriented language acquisition and technical basic education

In technical teaching, it is a good idea to combine language acquisition and basic technical training. This combination has to be used in such a way that the motivation for the acquisition of the second language, as well as a basic preparation for an apprenticeship in a technical profession, are promoted. Communication is supported by the use of objects which reduce language barriers. Even those who do not understand a single word of the language of their counterparts can communicate with or about an object by handling it or actively working on it. The use of tools and their appropriate application can be learned through demonstration and practice. This approach is not only helpful in overcoming initial hurdles of contact and establishing a sense of belonging to the community. The joy of a joint success achieved in the workshop can catalyze social integration. Although the social integration is only happening in an isolated scenario, it facilitates access to the language, because while actively participating in

the workshop, language is not a necessary condition for communication between two parties. It does, however, successively and successfully enrichen and differentiate the process. Traditional language teaching, on the other hand, is often devoted to a largely abstract and regulated language acquisition, which is based on verbal and literary language and which can only partially take individual interests into account (Cf. Hölscher et al.2006, p. 18).

In the teaching of technology, the opportunity arises to promote both language acquisition, basic and advanced skills, as well as competencies. This can be achieved by technical actions in class at different levels. Particularly in the first phase of linguistic orientation, a largely non-verbal mediation in action-oriented teaching contributes positively to influencing self-efficacy beliefs by first focusing on product orientation.

This offers the opportunity of unanimous recognition, which results from the success experience, for example by the solution of a repair problem or a special craftsmanship brought to light. Talents of a different nature come into play here, because a wide range of approaches to solving problems can be recognized as crucial. A gradual enrichment through the language, involving all the senses, is interpreted with action-oriented instruction as a complement to language teaching.

In this context, the action is understood to be an activity which is deliberately directed towards a specific goal and preceded by a thought out strategy that anticipates the action as an actual action plan. The action thus covers the entire process of planning, execution and control (Cf. Peterßen 1999, p.143). It is thereby thoughtfully prepared, executed and evaluated by the learners. They are accompanied and supported in various accentuations. In particular, if communication is not sufficiently possible via the language, the proportion of motor action sequences plays a prominent role. Which is why the linguistic part of the knowledge transfer has a (relatively) small share. The handling of tools can be important for the motivation and the self-efficacy conviction, especially for those students who still have problems with remembering and reproducing pure cognitive-language content. Where learners themselves are active and able to work with artefacts on their own. Intrinsic components of motivation are strongly encouraged, because the meaningfulness of action, participation and self-efficacy can come to the surface (Cf. Gudjons 2008, p. 60ff). The linking of knowledge contents that are stored and consolidated in the semantic memory are closely related to the situation to which they are relevant. The retrieval of the content therefore takes place with the combination of action and information, and facilitates the construction of complex memory structures. The

more frequently workflows are trained, the better the feedback processes can consolidate successful processes and the associated neuronal interconnections.

The aim of action-oriented teaching in language learning classes must therefore be to build up action patterns in which not only effective actions, but also their planning and control are accompanied by language, so that successive transfers to other situations can be built and achieved by building the vocabulary with regard to the action with a particular object, as well as comprehension, which is essential for the grasping of the meaning of the word (Cf. Hölscher/ Piepho/ Roche 2006, p.15). On the other hand, this approach offers the option of self-efficacy experiences that develop independent linguistic competencies from the language-independent action itself. In particular, pupils who have already established competencies in technical fields, but can not express them at the required (linguistic) level, can use this approach to express their potential. A language-specific teaching lesson for refugee children and adolescents, in which the above-mentioned problem areas are considered, must take the language acquisition itself into account, in addition to the sensitivity of the technical language (Cf. Bönisch 2014, p. 166). This includes the introduction and practice of the subject, as well as the use of the core vocabulary, which includes the 200 most frequently spoken words. "Kernvobular" (core vocabulary) (Cf. Bönisch 2014, p. 166 f.) refers to the most frequently used and most rudimentaly necessary words to be able to communicate in a language. 80 percent of the spoken language is made up of the so-called core vocabulary. This figure is independent of education, life circumatances or the profession of an individual. These are mainly non-specific functional words (pronouns, auxiliary verbs, adverbs, prepositions, articles, conjunctions), which are supplemented by individually used nouns. All words beyond the 80 percent mark are called edge vocabulary. This vocabulary, which consists essentially of nouns, verbs, and adjectives, can be 10,000-20,000 words depending on the general literacy and especially the literacy of the young people in a specific country (Cf. Bönisch, 2014, p.166). While the 200 core vocabulary words are often used and repeated, edge vocabularies are rarely spoken, but have an equally important role in communication. It is therefore sensible to focus on providing the core vocabulary (Cf. Bönisch, 2014, p.166). The core vocabulary is comparable with a foundation on which the language learning process can expand. It can be looked upon as the connective link in any communicative situation. In comparison to the expansion of the rather specific edge vocabulary, it is also relatively easy to obtain.

The concept of action-oriented second language acquisition in technical teaching

The concept of second language acquisition in technical teaching, which combines the focus on production in any technical action with systematic (specialized) language acquisition, strives to include as many perception systems as possible in the action. This includes the basic orientation system, the auditory system, the haptic system and the visual system (Cf. Gibson 1973, p.75). The more systems involved in an action, the greater the redundancy, because each perception system can record information about the object or the action. Even if the perceived stimuli are of a different nature, they contain equivalent information which together represent the object or the event (Cf. Gibson 1973, p. 82). Especially in motion-related words and their processing, the area of the brain responsible for the movement control is involved. "If you read or hear a verb that is movement-related such as "kick" or "run" or learn it, the brain area next to the speech center is activated, which performs the actual control of this movement." (Universitätsklinikum Hamburg-Eppendorf). It is therefore assumed that a significant activation of the motor cortex occurs (Cf. Storch/Tschacher 2014, p. 42f.).

Particularly in the first stage of the acquisition of foreign languages, it is to be assumed that the propositional thinking takes place in the mother tongue. The successive replacement and the construction of the vocabulary as well as the structure of the bilinguality should be additionally supported by the iconic as well as the haptic perception systems (Betzold). In order to make effective use of the different perception channels, as well as the related thinking processes in their different accesses, the present concept uses different media which have a correspondence to the perception systems. In this context, media is understood as support systems, which are assigned to the meaning modality, to which not only laptop, video or projector belong, but all media that transmit information, including teaching (Cf. Weidenmann 2006, p. 426 f.).

The concept therefore stimulates the following perception channels:

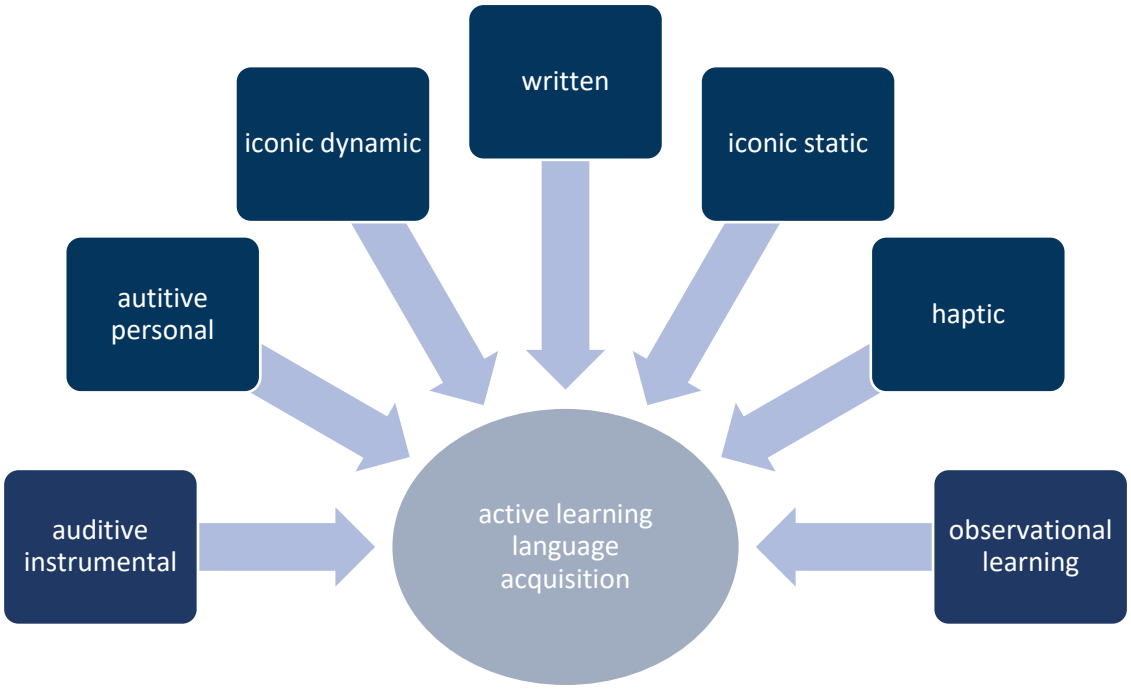


Image 1: active learning language aquisition through the use of different perception channels

The lessons are focused on stimulating the students in various ways. The haptic perception system is stimulated primarily by the production of the product. The fulfillment of the work contract is the focus here. In the use of tools, haptic and visual skills are linked in many ways. Certain perceptions can only be registered by the haptic (eg the weight), others only by the visual system (eg colors). The perception of the form of objects, on the other hand, involves both systems. The supporting medium is, in the first instance, the teacher, who prepares and explains all work steps (Cf. Weidemann 2006, S. 426 f.).

The used media for the language lerning process according to our method

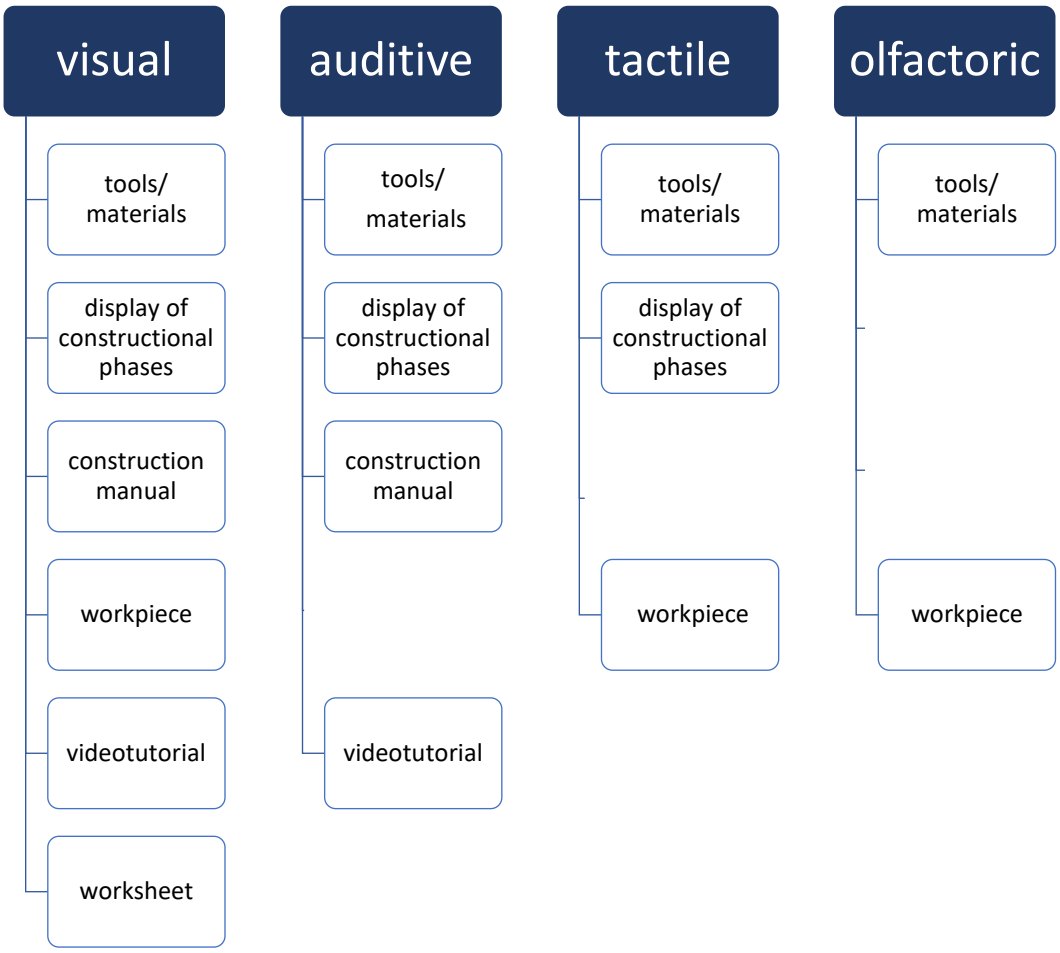


Image 2: Dislay of media and materials used for different channels

According to the graph shown above (image 2) the **visual and auditory perception** are two of four perceptions used in the presented language acquisition method. These perception systems and their meaning for the learning process are singularly explained in the following section.

Visual perception not only plays an important role in the handling of the tool and the product, but is also integrated into the language acquisition process in a variety of ways. Iconic representations play a major role both in the construction stage board and in the construction manual. In both forms of media, written explanations are complemented by iconic representations of the work steps. Both information channels are perceived via the visual system. The redundant presentation of image and text facilitates the comprehension of the text, as well as the associations between objects or process and concept. The preference for pictures in relation to the text is empirically clear, and independent of (second) language acquisition (Cf. Weidenmann 2006, S.446). On the one hand, this provides the learners with a supportive

method for linguistic appropriation, but at the same time also opens up the possibility of deriving the necessary specialist information for the next work step, independent of the text, only from the image. If the handling of the text is to be integrated systematically into the process, it makes sense to put the elaboration (verbal understanding, pronunciation, content, relevant information) of the respective text in the group before the step of the work execution (Cf. Weidenmann 2006, S.447).

The **tactile perception system**, which is shown as the third Item in the graph (image 2) includes the use of the workpiece, the display of constructional phases in the form of the construction panel and the tools.

The production of the product primarily stimulates the haptic perception system. "In contrast to other perception systems, the haptic system covers the whole body, most of its parts and its entire surface. The extremities are organs of sense for exploration, but they are also organs of execution; that is, the disposition to experience something is anatomically identical to the disposition to undertake something. This combination is found neither in the vision nor in the hearing system. We can explore things with our eyes, but that does not change the environment; But with our hands we can explore and change the environment at the same time (Cf. Gibson 1973, S. 134). "In the use of tools, the perception systems are linked in a manifold of ways" (Cf. Gibson 1973, S.134). Certain perceptions can only be registered by the haptic system (eg the weight), others only by the visual system (eg. colors), third only by the olfactory system (odors). The interplay between the perception systems and the handling of tools and materials is of particular importance when the second-language-internalized courses of action are thus integrated into a complex and significant neural network.

Last but not least, the graph shows the tools used to stimulate the **olfactoric perception system**. Even though the visual perception system is the most important source of perception, with auditory perception being second, the sense of smell plays a role in many cultures. Olfactory impressions and memories are hard to describe because the neural network to the memory center is more pronounced compared to the language center. Therefore, olfactory stimuli immediately trigger memories that are emotionally-charged (Cf. spektrum.de). Olfactory perception plays an important role in the area of the technical environment, because many tasks of work stimulate the sense of smell on one hand and provide information about processes or materials on the other. In the field of repair, diagnoses are often made about the smell: a charred contact is smelled by an experienced technician. The application of oil and colors provides a wealth of information about the olfactory sensory channels.

Odors are the most permanently stored information in our brains. The combination of smell and memory and related emotions activates many different centers in the brain. Hanns Hatt assumes that the sense of smell is not limited to the nose, but rather must be considered as a system of perception of chemical stimuli in the broadest sense. According to Hatt, signaling substances that absorb olfactory stimuli are present in the tissues and blood, but also in all other body fluids and muscles, in the skin and in the brain (Cf. Hatt/ Dee 2016, S.23)). The influence of the olfactory perception system on a holistic perceptual structure that also touches on cognitive areas can not be ruled out.

Materials for language acquisition

These basic methods are enriched by materials that explicitly serve language acquisition. These include memories that combine iconic with written and auditory elements. These memories are produced as a supplement to the construction manuals and, above all, capture the marginal vocabulary, which is thematized by the unit.

In order to train marginal vocabulary in a product-oriented way, this can be printed by the students on wooden plates or burned in with a soldering iron. It makes sense to prefabricate the core vocabulary according to the ranking, because these words must be in sufficient numbers and with the corresponding conjugation. Alternatively, this can also be made with cardboard. With these materials, learners can independently create sentences of varying degrees of complexity. These materials and their meaning for the lesson are covered explicitly below.

1. The **building panels** form a boundary between haptic, iconic - static, and literary presentation: The process of manufacturing the technical artifact is visualized on a display of the constructional stages. For this purpose, the semi-finished products are applied to the particular processing steps. A construction panel on the subject of "wooden tray" shows, for example, the different

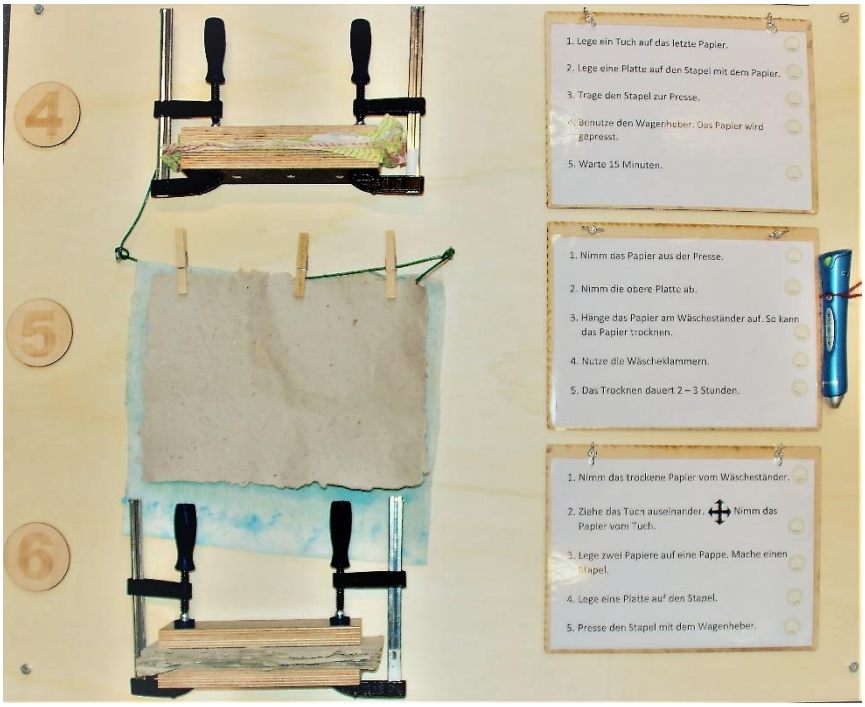


Image 3: Example for display of cinstructional phases in form of a panel

steps from the cutting of the wood to the gluing of the wooden parts up to the finished tablet. The image 3 shows an example for such a construction panel for the subject of "paper maiking". The workbench is supplemented by written work instructions, which are formulated in simple language. The instruction manual is formulated according to the language level. Since the construction panel only depicts the essential stages of the overall process, the language supplements are only an overview. Due to this mixed form of media, the construction panel is suitable for making the processing sheet available at any time. In addition, a one-to-one comparison is particularly important for the learner when the concept of scales or the knowledge of angular degrees is not (yet) established (View image 3 as an example).

2. In addition to the construction panel, a small step-by-step guide is used to accompany the steps for the production of the technical artifact. The **building instructions** consist of a small step sequence, as well as a corresponding working instruction, which is formulated at a linguistic level, corresponding to the group. Images and texts can be complementary or redundant. In the case of language acquisition, it makes sense to first select the redundant form because the implicit reference of the text to the image supports comprehension of the text (Cf. Weidenmann 2006, p. 447). In any case, the learning success is greater if both texts and pictures are used. The text should be in close proximity to the image and at the same time be presented with the image. In particular, learners with little knowledge or those with good spatial thinking have good results with text-image combinations (Cf. Weidenmann 2006, p. 448).

The building instructions can provide valuable assistance during the preparation of the respective work step, in the construction of the vocabulary as well as in the training of reading competencies. In addition, the construction guide is an indispensable medium for the independent development or orientation, which can be referred to when the learners need assistance.

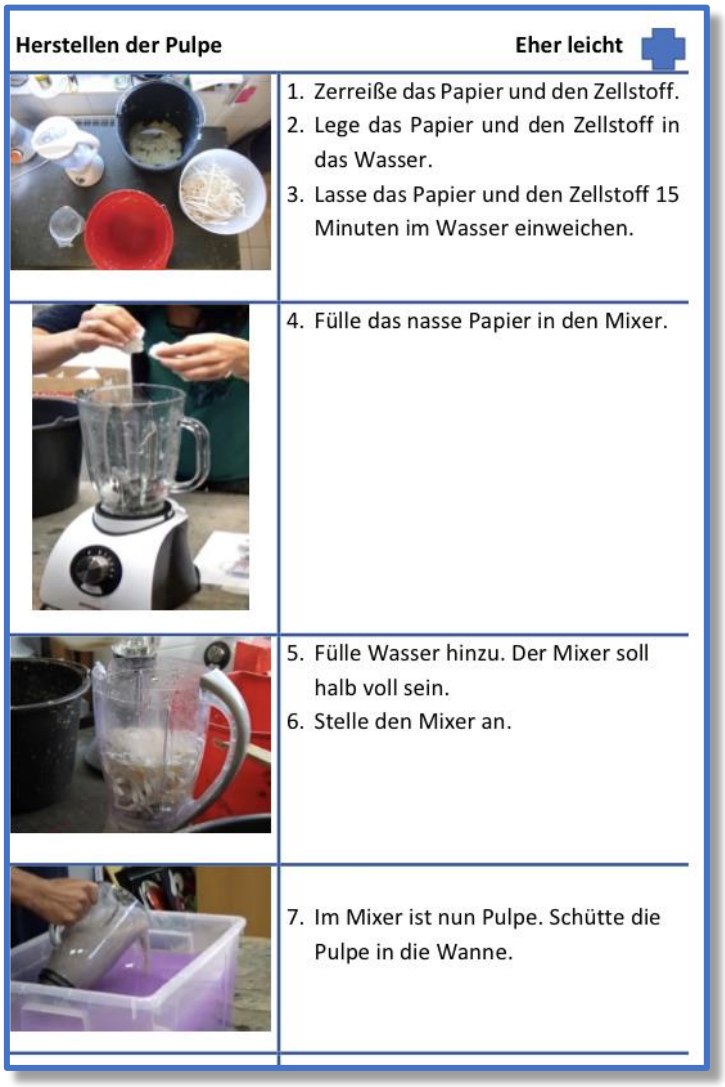


Image 4: Example of building instruction guide with pictures in Niveau 2 (of 3 possible Niveaus) in the german language

3. Furthermore, **instructions** are provided for the use of different tools and measuring and teaching instruments. Because the preparation of the project showed that even basic competencies such as the handling of rulers or angles are not or only partly mastered, basic competencies, such as the conversion of units, are usually also practiced. Worksheets for the acquisition of these skills which are constructed to reach the meta-level of technical expertise, are provided as accompanying material. The repetition and accumulation of the knowledge are basal for any basic technical education. Here again, the role of the teacher is to provide "help for self-help" and to help the learners to get the necessary information actively and independently.

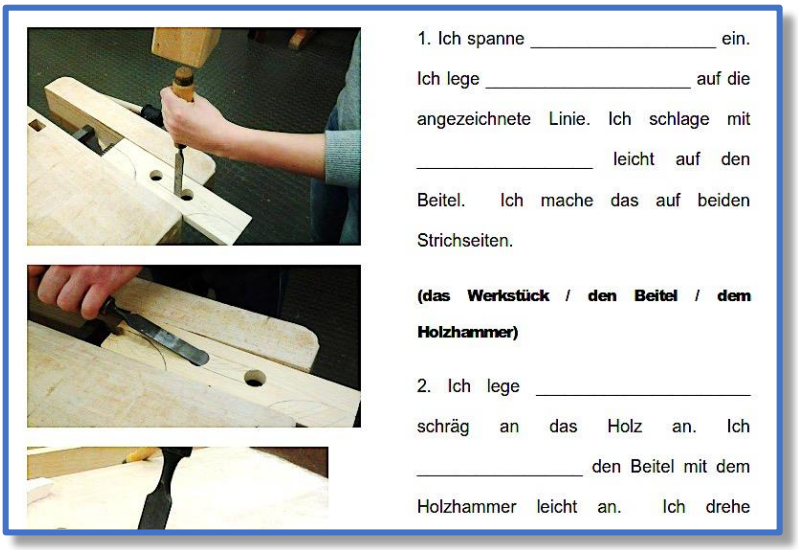
4. For pupils who have not been adequately alphabetized in their first language, it is particularly difficult to meet the demands of the second language acquisition in a literary profession. "The meaning of a word that is associatively learned and passed into cognition is therefore part of the linguistic development before the literary acquisition. For this reason, it is useful to provide access to the language in the second language acquisition. However, this approach is also suitable for learners who have problems with the pronunciation or want to improve it. "**Anybookreader**" is used to implement auditory perception (Cf. Betzold 2017).

These "lecture notes" can be discussed with the corresponding words, word combinations or work instructions. The language file is then linked with a code that is on a self-adhesive sticker.

Image 5: Anybookreader

Playback is performed by linking the stylus to the voice recording code. The work instructions written on the construction panels were thus linguistically fixed and the corresponding code stickers attached to the construction panel. The pupils can then use the Anybookreader to reproduce the work steps audibly. But the voice recordings were not only presented on the construction site chart. However, the language output can also be used to name tools, to accompany memory linguistically, or to accompany the construction guide in linguistic terms. Due to the possibility of linguistic use being generally low in the classroom, the use of the Anybookreaders is a prerequisite for the necessary repetition. The learner can access the discussion of professional terms at any time independent of the teacher.

5. To ensure the linguistic steps, **worksheets** are used in the form of gaps. The gaps are oriented directly on the work steps on the construction site panels and are provided in four levels with illustrations of the work steps. Level I formulates the text on the construction panel with slight omissions. Levels II and III have to be supplemented by gaps, in which considerably more omissions have to be added. In Grade IV, the pupils describe the work steps freely. The decision on which levels the learner selects their worksheets are self-evident. The fuse texts are determined according to the level of the learner and are based on the texts of the construction panel or the building instructions.



1. Ich spanne _____ ein. Ich lege _____ auf die angezeichnete Linie. Ich schlage mit _____ leicht auf den Beitel. Ich mache das auf beiden Strichseiten.

(das Werkstück / den Beitel / dem Holzhammer)

2. Ich lege _____ schräg an das Holz an. Ich _____ den Beitel mit dem Holzhammer leicht an. Ich drehe

Image 6: Example for a „fill in the blanks“ work sheet

6. **Video tutorials** supplement the setting. In particular, work elucidated verbatim, are supported by tutorials. These tutorials visualize the process, but also add auditive components. This multi-sensory approach is intended to build bridges across processes in the form of action, which can not be represented linguistically or badly, because, for example, implicit forms of competence acquisition are the focus in the handling of tools, but language instructions can support them in the sense of language acquisition. Recipients with a lower level of language education can profit from video tutorials, if they are sufficiently motivated and want to learn more about the topic (Cf. Weidenmann 2006, p. 256). However, moving images may not be combined with literary additions. Also, all distracting and entertaining details must be dispensed of (Cf. Weidenmann 2006, p. 448).

The process of manufacturing a product is at the center of the concept, because it is the core of the action. The work sequence is the "thread", which is enriched by the structure, conceptual rule knowledge, a (linguistic) vocabulary, as well as a successive expansion of grammatical structures. Experience with the learners in language classes has shown that a productive approach is highly motivating for them. In the procedural, largely non-verbal field, they can positively influence their ability-to-self-concept. This is especially true of young, male refugees. Here the learning of the model of Bandura (1979) plays an important role. The concept envisages that the teaching staff initially prepare each step for the entire group. The observation of this process triggers visual encodings. They save the process (more or less completely) in their iconic memory. In addition, some motoric encodings are made by following spontaneous and largely unconscious movements. If the teacher verbally comments on the work during this phase, they are also encoded as a indication of the language level (Cf. Steiner 2006, p. 158).

The reproduction process, which follows when learners understand the process internally and then actually carry it out, leads automatically to feedback, which can be done in two ways. The teacher corrects by showing the correct sequence. The performer recognizes his mistake in the result itself. Investigations on feedback from the trainer in connection with movement sequences have shown that his feedback can interfere with that of the learner and reduce the learning success to complete inactivity. Transferred to the technical instruction this means that it makes sense, to allow mistakes. Especially teaching the use of tools, these mistakes, when deliberately applied to the lesson in the sense of "trial and error" and within limits, can be a very useful method. Not only the pupils work at the workbench is affected, but it also affects the acquisition of the supporting elements.

On one hand, the accompanying systems of the lesson should provide multisensory access to the independent development and penetration of the work process, on the other hand they should prepare the learners at the meta level and independently acquire problem-solving skills. The highest priority, however, is the language acquisition, which guides the teaching process during the lesson at all times. The teacher plays a very special and significant role in this process, because while the students enthusiastically devote themselves to the production of the product, language acquisition has to be implemented in all phases first. The language learning instruments need to be emphasized by the teacher and in the beginning they need to be instrumentalized as a "hurdle" and later as a natural part of the process in a targeted and systematic manner in the classroom. If this crucial part of the Methos is abandoned and the implication of the language does not happen, the linguistic part in the lesson is neglected and therefore the concept completely misses its effect. By demanding the language related goals of the lesson first, the teacher prohibits product-oriented teaching of learning by the model which takes place with (almost) no language. The key is the motivational factor of being able to produce a result without having to be able to understand the language. The images and texts are used redundantly in this concept in order to facilitate understanding of the text via the image and to facilitate associations between the object or the process and the term. The preference for pictures in relation to texts has been proven by empirical studies and is independent from the (second) language acquisition. On one hand, this provides learners with a supportive method, but at the same time it opens up an opportunity to derive the necessary (and supposedly sufficient) information for the next step from the picture and to avoid the effort of dealing with the text. In order to systematically integrate the handling of the texts into the process, it makes sense to place the work with the contents of the texts (verbal understanding, pronunciation, content, relevant information) prior to the next practical work execution step.

Taking into account the situation of the many teachers who are confronted daily with multilingual, culturely diverse and highly heterogenic classroom compositions regarding their performance and motivation, it seems almost natural to provide them with a method that allows for students to have the possibility to work as independently and autonomously as possible. They can get the information they need to continue the work process without having to actually consult the teacher. This concept doesn’t only offer the students a chance to work more independently and gain self confidence by doing so, but also relieves pressure on the teacher and consequently creates space for more intensive, punctual and individual pedagogical work and entitles the teacher therefore to react to the needs of the students.

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