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A HOLISTIC APPROACH TO PROMOTE SELF- DIRECTED LEARNING

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Abstract
A holistic methodology for promoting self-directed learning is being developed in the learning center for electrical engineering at the Paderborn University (Germany). This concept will provide building blocks for learning, individual growth and collaborative development. To motivate learning, a strong focus is on self-determination, the percipience of competence and social embeddedness, which requires encouragement to work in small groups and personal guidance. The concept will be holistic in nature; it will supporting a balance across the students health, work, social contacts and attitude of mind (Life-Leadership®) by additionally developing extra-curricular skills and considering common learning strategies.

Keywords: Learning centre, self-determination, teaching technology, learning culture.

INTRODUCTION

The Bologna Declaration of 1999 had the goal to establish a European Higher Education Area for what the participating countries obligated themselves to follow-up complementary higher education reforms. Particularly since not all aims have been properly implemented and critical voices raised among employees and students, a discussion about the quality of the changed higher education system was initiated in Germany (Schuster, Hees, & Jeschke, 2010).

One response to improve the study conditions is the implementation of learning centres. The realisation of such is exquisitely manifold. The range stretches from new multi-storey buildings, even with a prayer room and showers (Grebner, Lamparter, & Papakonstantinou, 2010), over the expansion of libraries (Götz, 2010) and the establishment of cooperative structures (fusion of the offers of different institutions) (Stang, 2010) to (small) single rooms, whereby the interior design is increasingly important (Stang, 2013). The present learning centre of electrical engineering is a single room providing 36 working places (six hexagonal arranged tables with power supply). It is further equipped with two white-boards, one cabinet with 40 lockable compartments, some green plants and one smartboard. Besides the furnishing, a strong focus is on the encouragement to work in small groups and on personal guidance, since social embeddedness leads to learning motivation (Johannes, Einsle, Fankhänel, & Schulz, 2015).

METHOD

The holistic methodological concept combines varied methods, aspects and findings of learning processes, job requirements and life counselling. It should be understood as a system of building blocks, where the students have the choice to work for a certain need or interest. The concept creates breeding ground for learning motivation (individualisation, percipience of competence, social embeddedness, expectation of the module-effectiveness, feeling of success) (Caspary & Stern, 2010) (Johannes, Einsle, Fankhänel, & Schulz, 2015) (Riedl & Schelten, 2013), and it promotes self-directed learning. The latter is a form of learning where the students monitor, regulate and evaluate in a self-determined manner the learning progress. Here, if necessary, the

students may apply for support (Konrad & Traub, 2011). A further fundamental idea is that the students feel comfortable and enjoy the learning in the centre, as the sensation of pleasure releases messenger substances, which enhance the ability to memorise (Caspary & Stern, 2010). In the following, the key components of the concept are sententiously described.

Life-Leadership®

The Life-Leadership® is a concept that helps to balance between the four areas of life (simplified): attitude of mind, health, social contacts and work. It contains time-management (structuring everyday life) and self-management (issues of personal interests and visions), and it further invites to accept the dependence on the environment (people and their requirements) as well as to transform a filled life to a fulfilled one. A major issue here is to formulate proper aims for each area of life, following such, and to accept full responsibility for one´s own situation (Seiwert, 2001). Therefore, variegated practical techniques are given.

Boost of competencies

Competencies are capabilities, features or attitudes enabling to master requirements in complex situations (Maurer, 2006). A distinction is made between professional competence, self-competence, social competence and methodological competence. The last three are the afore mentioned extra-curricular skills. They are also named as key qualifications for personality development (Arnold & Müller, 2006). In this context, professional competence means the ability to handle mathematics and electrical engineering. Self-competence denotes personal abilities like clarifying and assessing development opportunities, requirements and restrictions of the family, work and public life, creating schemes of life, as well as forming of well-thought-out ideals (Nickolaus, 2012). Social competence means the willingness and capability to live and to shape relationships (team integration, cooperation, conflict handling, empathy, criticism, good manners, networking). Finally, methodological competence includes the abilities and the understanding to use general working methods and techniques (information and project management, creativity techniques, presentation, negotiating skills) (Maurer, 2006). The present concept invigorates them all.

Learning strategies

Learning strategies (LS) are methods to plan, execute, monitor and, if necessary, to adapt learning behaviour (Metzger, 2010). In the literature, learning processes are very often classified into three levels, whereat the descriptions differ from each other. One possible distinction consists between cognitive LS, metacognitive LS and resource based LS. Cognitive LS concern procedures of repeating, elaboration (linking of existing knowledge and new information) and organisation (structuring of new information). Metacognitive LS focus on the supervision of one´s own learning process (self-monitoring, -regulation and -evaluation). Resource based LS use the internal and external resources and imply the provision of personal learning conditions (concentration, effort, time-management, workplace design, group work, handling of disruptions etc.) (Bastian, 2012) (Wild & Möller, 2015). Here, variegated practical techniques are given, too.

FINDINGS

The holistic methodological concept lives on the use of the individually applicable opportunities, called the building blocks. Not all of them are explained in detail, but a brief overview is given here. Table 1 shows established and potential building blocks and their attributive boost of competencies and Life-Leadership®. The first column lists the building blocks, whereby a distinction is made between the established (upper) and the potential (lower) ones. Any further column refers to the three extra-curricular skills and the professional competence. Each array in the table briefly describes how the specific building block sustains each specific competence. The Life-Leadership® involved is illustrated with colours. Blue refers to the attitude of mind, green to health, orange to social contacts and yellow to the study achievement. Quite frequently the elements of the Life-Leadership® are not singly assignable. Hence, entire table sections are marked with colour if the chosen element fits best. Additional small coloured ovals are used in case of further matches of an element. Taking in initial view of Table 1, the study achievement mostly goes along with the methodological and professional competence, social contacts with social competence, and the attitude of mind with self-competence. In contrast, the element “health” mainly refers to one single (potential) building block, which indicates that some appropriate building blocks are still missing.

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Established building blocks

Although it might appear as a matter of course, the working space is an essential building block since it provides a place to study under favourable conducive learning conditions. For the students of electrical engineering, the learning centre is free accessible offering the possibility to socialise not only with professional content but with people also. When handling (smart-) boards (methodological competence), students become more self-confident by expressing their own points of view (self-competence), by improving their ability to talk/explain (social competence), and by improving their understanding and faculties while teaching (professional competence). This would certainly contribute to presentation skills.

First semester tutorials take place every day during the semester. Receiving support from the tutors, the students meet in self-determined manner to understand specific mathematical or technical matters (professional competence). Each participant may put forward ambiguities. This individualisation takes a major role, since it is one of the requirements for motivation (self-competence) (Caspary & Stern, 2010). In addition a green oval is added to the relevant blue coloured array in Table 1, since motivation has anti-stress effects. Depending on the arrangement of the tutorials, the students work individually or in groups (social competence), or they explain/calculate issues in front of the audience (methodological competence). As part of the tutorials, a training course for tutors in engineering is offered in each semester. This training course is about the role as a tutor, adult learning, activating methods, planning of tutorials, cooperative guidance and the principle of minimal support. In addition, the tutors may aim for their own topics or interests.

Moreover, the seminar "instruction to scientific work" is offered in the learning centre. It concerns scientific fundamentals (terms, methods, quality criteria), planning (framework, work management), handling literature (research, selection, administration), scientific work out (structure, form, stile), presentation (preparation, performance), and the creation of scientific poster. The seminar combines pure instructional phases with interruptions in order to actively involve students in the construction of the imparted knowledge (Nofen & Temmen, 2015). This is effected by diverse exercises in individual- or group work. Here, the attitude of mind (compare the blue array in the third row of Table 1) may be strengthened inasmuch as the students identify themselves with science. At the end of the lecture, the students are requested to submit eight pages of term paper (Walther & Temmen, 2013). Here also, the students are encouraged to make use of individual guidance.

Table 1: Building Blocks and their Attributive Boost of Competencies and Life-Leadership® (coloured)

Established Building Blocks	Self Competence	Social Competence	Methodological Competence	Professional Competence
Working space		Free accessible venue	Allocation of various equipment	
First semester tutorials	Learning motivation	Group work	Solution steps	Exercises
Seminar: Instruction to scientific work	Introspection, identification with science	Group work, presentations	Scientific methods, time management, PQ4R	Research, quoting, scientific writing
On-site support	Straightforwardness	Openmindness	Solution finding strategies	Improved understanding
Individual guidance	Self-Critisism	As applicable	Learning strategies	As applicable
Work in small groups	Learning motivation	Mutual support, conflict handling, learning culture	Group organisation	Easier understanding
Smart- and whiteboards for discussions / presentations	Self-confident expression of one´s own points of view	Eloquence	Use of the Boards	Improved understanding when teaching
Individual work	Self-dependance	Tranquillity	Planning	Independent

			strategies	elaboration
Training course for tutors	Self-Management, self-actualisation	Group work, role perception	Activating methods, principle of minimal support,feedback	Didactic planning, adult learning
Potential Building Blocks				
Various workshops	<manifold>	<manifold>	<manifold>	<manifold>
Quality Talk	Encouragement to speak openly (with professors)	Eloquence, respect and appreciation	Line of argument, negotiating skills	As applicable
Educational animations	Focussing	Subsequent discussion	Methodological content	Technical content
Laptops on loan	Improved self-esteem by mutual support	Mutual support where needed	Use of technical software (SW)	Deeper understanding, handling of the software
Elements of suggestopedia	Strengthening of one´s own being	Additional general education	Relaxation techniques	
Physical exercise at the learning place	Self-assurance	Team building activities	Isometric training, various exercises	
Working space			Water tank, apples	Bundling

Attitude of mind: Health: Social contacts: Work / achievement (studies):

Potential building blocks

One idea to expand the offer in the learning centre is the implementation of quality talks. A quality talk is understood to be a meeting of an interest group (students) with one selected professor for informal talk about suggested topics which follow the main interests of the students. This could solve possible problems and improve mutual appreciation (social competence and contacts). In this context, for some students the encouragement to speak openly might be a chance to overcome their fear of speaking, thereby to get more self-confidence, as a result of which they could change their attitude of mind. For comparison see to this the array in Table 1: orange filling with a small blue oval. The first quality talk will take place at June 30^{tn}, 2016.

A further potential building block are laptops on loan. Possibly unspectacular, but promoting self-directed learning. Equipped with the necessary and relevant engineering software (freeware and commercial), the students will be able to learn the software programs auto didactically (methodological competence), they will have the chance to share mutual support (self- and social competence and contacts), and they obtain a deeper understanding of the subject matter (professional competence).

In addition, educational animations are being developed in the field of expertise cognitive systems engineering. These animations (3D) focus on dedicated issues, where students encounter significant problems of understanding. Besides open publications, these animations will be used in the learning centre. As a further measure, the animations could be combined with elements of suggestopedia. The suggestopedia is a holistic learning method coordinating the use of body and mind. It takes into account aspects of biology, neural-psychology and pedagogy and implies relaxation techniques, (baroque) music and games while learning. (It was established by Dr. Georgii Lazarov, physician and psychiatrist in the 60´s) (Frisch, 1988). In this context it is important to overcome suggestive barriers (Edelmann, 2000). Influencing the attitude of mind (see the blue arrays in Table 1), the elements of suggestopedia create a balance with regard to the subsequently study achievements. The effects (learning outcomes) will become apparent.

Based on the exchange with the students, various workshops are thinkable. Aside from personal conversations, questionnaires will be used to evaluate further interests and improve critics. Physical exercises at the learning place could be a feasible improvement. The green colour indicates that the main focus is on health. As surplus,

physical activities lead to enhanced cognitive functioning (better learning success) (Gómez-Pinilla, So, & Kesslak, 1998).

Finally, the working space asserts itself again as an essential building block since the learning centre shall bundle the subject-specific building blocks of all fields of expertise in the department of electrical engineering that deal with student´s problems of understanding.

DISCUSSION AND CONCLUSION

This paper describes a holistic approach to promote self-directed learning. It takes learning motivation, LS, important competencies, wellbeing, balancing of life and fun into consideration. Self-directed learning mainly goes along with the self-determination of the students. This is given on three different levels: on the structure of the holistic methodological concept (possible selections), on the active contribution in each building block, and on the contributed generation of new building blocks. Thus, the holistic methodological concept is flexible and expandable.

Like a newly planted little young tree, where it is uncertain how it grows, it will be shown if this concept yields an open-minded learning culture. In return, the identification of appropriate indicators is necessary.

REFERENCES

Arnold, R. & Müller, H.-J. (2006). *Kompetenzentwicklung durch Schlüsselqualifikations-Förderung*. 3. Edition. Baltmannsweiler. Hohengehren, Germany: Schneider

Bastian, J. & Groß, L. (2012). *Lerntechniken und Wissensmanagement: Wissen erwerben, speichern und verwerten*. Konstanz, Germany: UVK-Verl.-Ges.

Caspary, R. & Stern, E. (2010). *Lernen und Gehirn: Der Weg zu einer neuen Pädagogik*. 7. Edition. Freiburg im Breisgau, Germany: Herder.

Edelmann, W. (2000). *Suggestopädie, Superlearning: Ganzheitliches Lernen - das Lernen der Zukunft*. 3. Edition. Heidelberg, Germany: Asanger.

Frisch, S. E. (1988). *Lernhemmnisse im Erwachsenenunterricht aus suggestopädischer Sicht*. Lüneburg, Germany: Schmidt-Neubauer.

Gómez-Pinilla, F., So, V., & Kesslak, J.P (1998, March 26). Spatial learning and physical activity contribute to the induction of fibroblast growth factor: Neural substrates for increased cognition associated with exercise. In: Neuroscience, 85, 53–61.

Götz, M. (2010). Lernzentren – ein Überblick und eine kurze Einführung. In: BIBLIOTHEK Forschung und Praxis, 34.

Grebner, B., Lamparter, M., & Papakonstantinou, E. (2010). Analyse von Lernzentren in Bibliotheken in den USA und Europa. In: BIBLIOTHEK Forschung und Praxis, 34.

Johannes, C., Einsle, F., Fankhänel, T., & Schulz, K. (2015, March). Learning Environment and Learning Outcomes in a situated cross-year Teaching Concept for the Activation of study-relevant Resources. In: Conference of the German Association of University Didactics, Paderborn.

Konrad, K. & Traub, S. (2011). *Selbstgesteuertes Lernen: Grundwissen und Tipps für die Praxis*. 3. Edition. Baltmannsweiler. Hohengehren, Germany: Schneider

Maurer, H. (2006). *Handbuch Kompetenzen: Strategien zur Förderung überfachlicher Kompetenzen*. [Basic skills], 2. Edition, Bern: hep.

Metzger, C. (2010). *Lern- und Arbeitsstrategien: Ein Fachbuch für Studierende an Universitäten und Fachhochschulen*. 11. Edition. Oberentfelden/Aarau, Germany: Sauerländer.

Nickolaus, R. (2012). *Didaktik - Modelle und Konzepte beruflicher Bildung: Orientierungsleistungen für die Praxis.* 3. Edition. Baltmannsweiler. Hohengehren, Germany: Schneider.

Nofen, B. & Temmen, K. (2015). Lecture meets laboratory: Experimental experiences for large audiences: Results of a first implementation and recommendation. In: 2015 IEEE Global Engineering Education Conference (EDUCON), 141–144.

Riedl, A. & Schelten, A. (2013). *Grundbegriffe der Pädagogik und Didaktik beruflicher Bildung*. Steiner.
Seiwert, L. (2001). Life-Leadership®. Stuttgart: Campus.

Schuster, K., Hees, F., & Jeschke,S. (2010, November 23). Dipl-Ing Rest in Peace? The Implementation of the Bologna Process in Germany's Engineering Education. Retrieved November 11, 2015, from http://www.teaching-learning.eu/fileadmin/documents/Publikationen/AE100172.PDF.

Stang, R. (2010, January). Lernzentren als Option für Bibliotheken: Herausforderungen für Lernarchitekturen und Organisationskulturen. In: BIBLIOTHEK Forschung und Praxis.

Stang, R. (2013, September). Creating learning environments. Research on the relevance of space on the designing of learning landscapes. In: Information - Wissenschaft & Praxis. 64.

Walther, T. & Temmen, K. (2013). 'Learning by doing': Improving academic skills. In: 2013 IEEE Global Engineering Education Conference (EDUCON), 118–122.

Wild, E. & Möller, J. (2015). *Pädagogische Psychologie*. 2. Edition. Berlin / Heidelberg: Springer.