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# Personal Skills in the BISE Curriculum: An Integrative Approach

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**Abstract.** In an increasingly complex and dynamic world, young executives need certain soft skills to be forearmed for the challenges of their job. The need for training of these personal skills in higher education is recognized among the business and information systems engineering (BISE) society. Yet, existing approaches often integrate the development of soft skills implicitly, usually without quantitatively measuring the impact on students. However, an initial literature review identified a demand for an explicit and systematic integration of personal skills in basic lectures. We present an approach that systematically integrates the training of personal skills in a basic BISE lecture for first-semester students. To exemplify this approach, we describe the integration of the self-leadership strategy self-observation in a lecture on process modeling. Our research project follows the Design Science Research methodology. The outlook previews the completion of the first design cycle by describing the planned evaluation and further research ideas.

**Keywords:** Soft skills, personal skills, integrative approach, BISE curriculum.

## 1 Introduction

Soft skills are crucial for business and information systems engineering (BISE) students to become successful young executives in an increasingly complex business environment [1] and employers strongly expect skills related to a positive attitude, self-motivation, and self-direction [2, 3]. The need for soft skill development in higher education is well known in the BISE domain and worldwide discussions regarding the lack of soft skill training amongst graduates are going on for decades [4]. For German-speaking countries, the “Wissenschaftliche Kommission Wirtschaftsinformatik” (WKWI) and the “Gesellschaft für Informatik” (GI) formulated guidelines for BISE education, including relevant personal skills [5]. Currently, lectures or seminars typically foster soft skills implicitly [4]. Explicitly, soft skills are mostly offered as voluntary add-on courses for small groups of students [6]. These offers are often not well-attended by business students [7] and taught content might not be learned sustainably [8]. Furthermore, the soft skill development is inhibited by students’ focus on subject-oriented content, a large number of students in one classroom, and lecturers’ limited time to cover the syllabus content [9, 10]. As a result, the gap between the actual soft skill level of graduates and the soft skill level expected by employers is increasing

[2, 11, 12]. Integrative teaching approaches within basic BISE lectures could counteract these problems [4, 13]. Basic lectures, which are a mandatory part of the study program, have the advantage of providing a reliable platform to reach students. In particular, BISE methods, which are rather abstract and often relevant for exams (e.g., EPC modeling), could serve as a "carrier" for soft skill integration. To build on insights of existing approaches and to identify already defined requirements, we conducted an initial systematic literature review. Based on the results, we suggest a "2 in 1" concept fostering relevant soft skills more explicitly in a first-semester BISE lecture. To take up the need for a systematic approach, we use an established framework in the soft skill context: Self-leadership (SL). SL addresses relevant personal skills as it enables people to gain the needed self-direction and self-motivation to perform [14]. As a theoretically grounded concept, validated questionnaires to measure effects are available [15]. Our integrative approach enriches subject-specific lectures with soft-skill content in form of interactive videos. These videos deepen students' subject-specific knowledge by using typical BISE methods within a SL context. Based on the findings that students' active role [16] and reflection periods [17] are beneficial in soft skills training, we identified the experiential learning theory [18] as a pedagogically valuable framework for structuring the videos.

The superordinated research question of this Design Science Research (DSR) project is: To what extent can SL skills be fostered through targeted integration into subject-specific content within a basic BISE lecture? This research in progress contribution describes the artifact developed within the first design cycle according to Hevner [19]. The overall goal is to implement and test the approach in an BISE lecture. The focus of this paper is on an initial learning unit integrating self-observation into a lecture addressing process modeling. The planned evaluation is described in the outlook.

## **2 Theoretical Background and Literature Review**

The GI and WKWI published the "Guidelines for Education in BISE at Tertiary Institutions" [5]. These guidelines highlight certain skills, specified as subject-specific skills, social skills, and personal skills: Subject-specific skills comprise "concepts and methods that enable students to analyze, design, implement, operate, and use information systems" [5], for example, process modeling (e.g., BPMN or EPC [20]). Social skills include cooperation and communication skills. These are typically addressed in seminars (e.g., through presentation tasks) [21] and not the focus of this paper. Personal skills include learning skills, the ability to reflect autonomously on work experiences, and to adjust behavior accordingly [2, 5].

With the objective of analyzing the knowledge base on integrative approaches to soft skills development in higher education, we conducted a systematic literature review. Following vom Brooke et. al. [22], we searched sequentially in three databases and identified representative literature using the keyword search (("higher education" or universit\*) AND ("soft skill\*" or "personal skill\*" or "self-leadership") AND ("integra\*")). It results in a total of 154 articles (EBSCOhost 46; IEEEExplore 88; AISel 20).

In general, BISE lectures and students value the training of soft skills [7, 23, 24]. Overall, the literature review identified the need for an integrative [2, 25], systematic and measurable [7, 13, 25], and explicitly addressed [2, 24, 25] approach which starts at the beginning of university studies [26, 27]. Students should actively take part in the learning process [16, 28], for example, by integrating experiential learning elements [13] with authentic activities [29] in simulated environments [30]. None of the examined 154 articles incorporated all identified needs. So far, soft skill training is often integrated through seminars and concepts like problem-based [e.g., 21, 31, 32] or project-based learning [e.g., 33, 34]. Furthermore, soft skills are mostly integrated implicitly [e.g., 35, 36]. However, for effective development, soft skills should be explicitly mentioned as learning objectives [2]. To ensure improvement and accountability to curriculum objectives, it is important to articulate and systematically measure soft skills [13]. Our approach aims to address the identified needs:

To take up the demand to measure the effects quantitatively [13], the concept of SL is used as it addresses skills related to a positive attitude, self-motivation, and self-direction [2, 37]. SL includes a set of strategies to increase personal effectiveness and performance [38]. These strategies are related to behavior, natural rewards, and constructive thought patterns. Behavioral strategies contain self-observation, self-goal setting, self-rewarding, self-punishment, and self-cueing [37]. These strategies are designed to facilitate desirable behavior [38]. For this research in progress contribution, we concentrate on the behavioral strategy self-observation. Self-observation allows identifying potentially unsatisfying conditions, by recognizing the current situation and making it comparable with the desired state [39].

To take up the demand for students to be in an active role [7, 16], we implement interactive videos, that enable students to experience training scenarios individually. The videos incorporate the experiential learning theory [18]. This theory contains four steps [18]. The following activities specify these steps [40]: 1) concrete experience: learners are in an active role, have responsibility for the process, and react spontaneously. 2) reflective observation: learners reflect on their experience alone or with others and foster a metacognitive perspective. 3) abstract conceptualization: learners transfer context-specific experience to abstract and contextual-indifferent levels. 4) active experimentation: learners need to test the results of the abstract conceptualization against new experiences [18, 40].

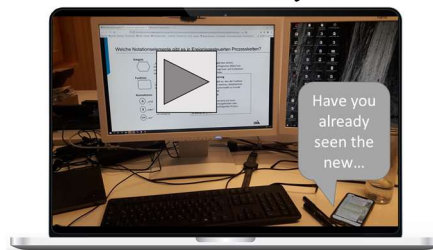
The result of our literature review indicates that the way we integrate soft skills into subject-specific skills is new and innovative, as no similar approach was identified.

### **3 Integrative Approach to Foster Self-Observation**

The artifact of this contribution is an interactive video that integrates self-observation into the topic process modeling. These topics are combined, due to their common aim to analyze procedures and reveal their weaknesses. The video is embedded in a BISE lecture following the flipped classroom concept, where initial knowledge transfer is enabled through self-study material [41]. In the following synchronous active plenum, students apply and test their knowledge. Students need around 30 minutes to complete

the interactive video and its corresponding tasks. Our integrative approach follows the four steps of the experiential learning theory:

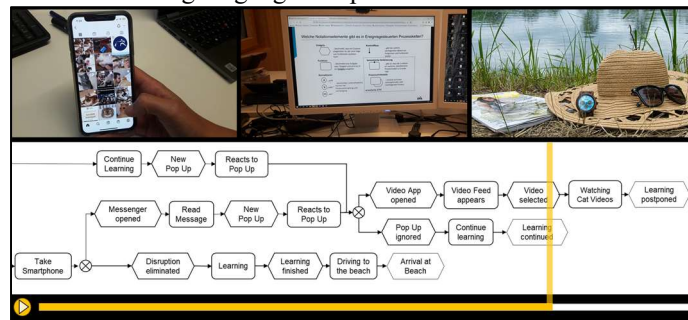
The first step is to create a **concrete experience** through a virtual learning scenario. Following the requirements of the experiential learning theory, the interactive video offers students the possibility to make individual decisions about the course of the video, creating the base for a self-observation experience [18, 40]. The starting scene presents a student's desk in a first-person perspective (Figure 1) depicting a realistic learning scenario. It shows a computer with the open website of the university's learning management system, in particular a self-study video explaining EPC notation. Here, students can choose to start the video for self-study or use the smartphone virtually.



**Figure 1.** Starting Screen of the Interactive Video

During this first step, the students are given multiple decision options. Depending on students' selected paths, the duration of the interactive video differs (3-6 min). The most efficient way to complete the first step of the interactive video is to choose the option to eliminate possible distractions and then start the self-learning video that explains the EPC notation. Other paths include checking messages and continuing to use the smartphone for distractive actions. These options prolong the duration. At the end of the first step, students are confronted with the time it took them to complete the task and the amount of time it took to complete it in the most efficient way.

In the second step, the interactive video guides students to the **reflective observation** [18, 40]. A split-screen video provides a progress comparison created from all possible decision paths (Figure 2). It allows students to observe their decisions made in the first step and compare them to alternative paths. To illustrate the different paths, an EPC excerpt depicts the progress during the first step of the interactive video. In this way, the notation of the modeling language is repeated as well.



**Figure 2.** Abstract Conceptualization during the Interactive Video

The third step is the **abstract conceptualization**, where reflective questions guide students to review their experience on an abstract, context-indifferent level [18, 40]. Questions are: Why is it important to observe your activities? How could you implement your findings in other aspects/activities of your life? This step also illustrates links between self-observation and organizational process documentation, as both enable to identify ineffective resource management. The students are invited to document their answers in the lecture forum, to provide lecturers and their fellow students the possibility to give feedback on their reflections and to learn from other reflective thoughts.

The last step is the **active experimentation**, where students are encouraged to make new experiences [18, 40]. A call-to-action invites them to transfer their findings from the previous step to other actions or routines in their daily life. The goal is to document personal processes and to analyze them regarding possible inefficiencies. It is suggested that students try to document their routines with the EPC notation, but they are also free to use another notation. The overall goal is to give food for thought on self-observation possibilities to improve routines and reduce potential inefficiencies.

## 4 Outlook

In this paper, we focused on the SL strategy self-observation that is integrated into a lecture unit addressing process modeling. Within the first design cycle of our DSR project, we plan to integrate all behavioral SL strategies into the addressed BISE lecture, combining the following topics in interactive videos: project-management methods and self-goal setting; process models and self-rewarding / -punishing; data management models and self-cueing. The videos are implemented as H5P modules and will be published as open educational resources.

The effectiveness of our approach will be evaluated in the winter semester of 2021/22, where we expect 70 students to participate. The revised SL questionnaire [15] will be used to collect quantitative data. Additional open-ended questions will provide students the opportunity to add qualitative feedback. Data will be collected at the beginning and the end of the semester. The goal is to identify significant changes in students' use of SL strategies and discover potential long-term effects. While we understand the integration of personal skills into subject-specific skill training as a valuable addition to the current BISE curriculum, we do not intend it to replace traditional soft skill courses. The aim is rather to make the previously implicit training of personal skills during BISE education more targeted and efficient. So far, our approach focuses on behavioral SL strategies. In future DSR iterations, we plan to integrate constructive thought patterns and natural reward strategies in a holistic teaching approach incorporating findings of the evaluation.

The importance of soft skill training is not limited to BISE students only, but essential in various disciplines [3, 42]. Therefore, our research addresses the overarching goal to investigate the suitability of 1) subject-specific methods serving as “carrier” for soft skill content 2) interactive videos to foster soft skills. These general findings can provide a foundation for integrative approaches in other disciplines (e.g., economics).

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