Time Management in Higher Education

Time management is regarded as an important prerequisite for effective and efficient learning in higher education. However, university students' time management frequently proves to be deficient, especially with freshman students, who can therefore benefit from appropriate time management interventions.

1. Self-Regulated Learning and Time Management

Self-regulated learning is regarded as a self-directed process in which learners plan, monitor, and evaluate their use of learning strategies to achieve specific learning goals [1][2]. Although models of the process of self-regulated learning differ in nomenclature and segmentation, they commonly include a cycle of multiple distinguishable phases (for an overview, see [3]). These phases conventionally refer to a series of related *knowledge* and *behavior* components [2][3][4]. Accordingly, the phases of self-regulated learning can be referred to as the *forethought*, *performance*, and *self-reflection* phases, each of which comprises sets of related sub-processes [4][5]. During this process, learners need to evaluate the task at hand, as well as their own knowledge and skills, to plan their learning activities appropriately (*forethought phase*), use appropriate learning strategies to enact their learning plan and monitor their progress during task performance (*performance phase*), and reflect on recent strategy use to adapt their existing knowledge of relevant learning strategies and thereby optimize future learning behavior (*self-reflection phase*).

An important component of effective self-regulated learning is efficient time management. The use of time management strategies is associated with the use of other types of strategic self-regulatory behaviors that support learning activities, including cognitive, metacognitive, and other resource-management learning strategies [6][4][7][8][9][2][10]. Time management is an integral component of prominent theories on self-regulated learning, where it is considered either explicitly as a behavior that learners can actively control to self-regulate their learning activities [6][11], or implicitly as part of other regulatory processes, such as volitional strategies or goal setting and planning [12][13].

Time management can be defined as clusters of behavioral skills that are beneficial in the organization of study and course load, and that help learners to facilitate their productivity to achieve their learning goals [14][15]. These skills include assessment behaviors aiming at awareness of time use, planning behaviors aiming at selecting and setting up realistic goals, and monitoring behaviors aiming at the observation of time use while performing activities and reflecting on previous organizing behavior. The processes that are subject to time management refer to these forethought, performance, and self-reflection phases, as outlined in the self-regulated learning framework (for a detailed review, see [16]). In the forethought phase, learners need to activate knowledge regarding time management strategies to analyze the task at hand by gathering information regarding the estimated time needed for task completion, as well as any relevant deadlines, and then plan their learning activities by setting goals and priorities within the given timeframe to establish time-related standards for progress or success. In the performance phase, learners need to initiate the use of their strategic plans, consider the planned time and duration of relevant learning activities, and monitor compliance with their learning schedule. In the self-reflection phase, learners reflect on their learning activities by evaluating time-related experiences and outcomes, such as the chronology of task completion, their actual time investment, and whether deadlines have been met, to adapt their time management strategy knowledge and optimize their prospective use of time management strategies.

2. Time Management in Higher Education

The university learning environment poses diverse challenges to students' organizing behavior. Efficient time management is an essential tool to cope with these challenges without falling behind in the curriculum and eventually dropping out. It helps students to understand the effort that is required for effective learning and enables them to structure their learning activities and develop appropriate study habits [4][10][17]. Accordingly, empirical studies frequently

demonstrate a significant correlation between students' time management and academic performance [18][19][20][21][22][23][24], as well as well-being factors such as lowered stress and anxiety [18][25][26][27].

Unfortunately, freshman students' time management skills tend to be deficient at the beginning of their academic career. They underestimate the time required to study successfully [28][29] and report problems in regulating study time and class attendance alongside non-university obligations [30][31][32]. They spend a considerable amount of time on activities that are not conducive to their academic performance or that distract them from learning activities, such as social networking or watching TV [33][34]. Overall, university students appear to be especially prone to procrastination [35][36][37] and report related self-handicapping behaviors even during class attendance [38][39][40]. It can be summarized that time management is a common problem, especially among freshman students, and that time management interventions can be an important tool to facilitate the challenging study entry phase, to foster performance and reduce dropout. Indeed, there is some evidence supporting the effectiveness of interventions in enhancing time management skills and performance [41][42][43][44][45][46][47][48][49][50]], although findings regarding the effects on performance variables are mixed [18][19][51][52][22][53][54][55].

3. Intervention Approaches and Related Issues

There are different possible explanations for the inconsistent state of research on the effectiveness of time management interventions that aim to foster time management skills and academic performance. First of all, relevant studies tend to focus on workplace settings rather than academic contexts, and research on the effectiveness of time management interventions in fostering academic performance is comparatively scarce [19][56][42]. Moreover, existing time management interventions for freshman students do not always allow conclusions to be drawn about their effects on academic performance. For example, time management instruction based on knowledge transfer is quite common as a part of freshman courses aiming to support performance and retention [57][49][58]. Corresponding programs have indeed been found to improve academic retention and graduation rates, but with time management here being one part of more general study orientation or learning strategy courses, these programs usually do not provide reliable evidence about the isolated effects of time management instruction on academic performance.

Another important issue with time management intervention studies is a lack of consistency in the conceptual understanding and measurement of time management [19]. Although time management is considered as an important component of self-regulated learning, its operationalizations often lack reference to the successive phase structure provided by process models of self-regulated learning [4][59]. Given this theoretical framework, effective time management interventions should address processes relevant to the forethought, performance, and self-reflection phases of the learning cycle, to provide students with the strategy knowledge required for the situationally appropriate use of time management strategies, and to enable them to optimize their time management behaviors over time via practice and self-reflection. This is supported by evidence showing that students' individual self-regulation deficits differ in terms of the phase of the self-regulated learning process in which they occur, and the learning strategies they affect [4][60][61][62][63]. For example, some students might lack basic knowledge (*forethought phase*) regarding a specific learning strategy, whereas other students have the required basic knowledge, but fail to use the strategy successfully (*performance phase*) to overcome learning difficulties [64][65][66]. In this context, several studies have found that students tend to have sufficient (declarative) knowledge about learning strategies, but still do not use the corresponding strategies successfully in relevant learning situations [65][67][68]. These findings indicate that students cannot necessarily transfer available strategy knowledge into successful strategy use on their own, which would be crucial for time management interventions focusing on imparting time management knowledge.

Accordingly, imparting time management knowledge should be a useful way to promote students' time management knowledge, but might not provide them with the skills required to develop the self-regulated time management behaviors they need to improve performance. This is reflected by results from time management intervention studies aiming to improve time management behaviors and performance via time management instruction. Macan [51] (Study 1), for example, tested the effects of an intervention that provided information on central time management behaviors such as goal setting, prioritizing, scheduling, and planning. The instruction consisted of a single session that lasted half a day and used multiple methods to teach time management strategies, including lectures, group discussions, and films. Apart from a small increase in the self-reported use of goal setting, the time management instruction had no significant effects on participants' time management behaviors and performance ratings. In a similar study where the time management instruction lasted two consecutive sessions, Macan [54] found no significant differences between a time management intervention group and a control group for post-intervention self-assessments of time management behaviors, and performance ratings were even higher for the control group than the intervention group. Moreover, Lincoln and colleagues [53] provided participants with a self-directed training package that included comprehensive information on how to improve time management skills that participants should use to improve their time management over the course of five

weeks. The results showed no significant improvements in participants' time management skills. Finally, Häfner and Stock [52] carried out an experiment that entailed providing a very elaborate one-day time management instruction, supplemented by small cards with guidelines and a training booklet that afterwards should help participants to consolidate and improve the strategies learned. Participants' self-reported use of time management behaviors had significantly increased six weeks after the intervention, but there were no significant effects on performance indicators. These findings show that imparting time management knowledge can help to improve participants' self-assessments of their time management behavior. However, given the absence of performance improvements, it can be questioned whether the time management knowledge provided actually improved participants' time management behavior, or rather their corresponding self-perceptions, on which the used self-assessments tend to rely [69][70][71].

In any case, time management knowledge alone seems not to imply the successful use of time management strategies, and a stronger focus on time management practice with sufficient time to foster time management routines may be important for enabling students to develop effective time management behaviors and thereby improve academic performance. Indeed, there are few studies with intervention designs that considered processes relevant to all three phases of the self-regulated learning process in training time management, which fairly consistently report improvements in learning behavior and academic performance [43][44][46]. Apart from introductions to time management strategies (*forethought phase*), students here particularly had the opportunity to deliberately practice the strategies taught on a regular basis over a longer period of time (*performance phase*). This practice was supported by learning diaries [46] or online learning systems [44], which made students use the time management strategies taught, and helped them to structure and monitor their learning activities. Furthermore, practice was supplemented by self-evaluations of learning progress (*reflection phase*), to help students optimize their strategy use over time. These findings indicate that encouraging students to practice time management and giving them sufficient time to optimize and consolidate efficient time management behaviors might be essential to effective time management interventions. However, these findings do not provide information on the specific effects that the practice focus of these interventions offers, in comparison to interventions focusing on time management knowledge, as the studies either included time management as a part of more global interventions on self-regulated learning, or did not include separate time management intervention groups so as to get information on the differing effects of time management knowledge and time management practice.

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