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Title: The Role of Executive Functioning Skills in Achieving Academic Success and Navigating Current Pandemic Uncertainties: Introducing ExS.

Article type

Rapid Response

Abstract

The ExS programme is intended to be an autonomous online learning tool for individual students to become more aware of their own personal executive functioning skill strengths and weaknesses. The programme offers suggestions to those who wish to develop their ability to self-regulate these skills and to provide strategies that can be used to compensate for weaker executive functioning skills that can contribute to a negative experience in higher education and consequently lead to poor academic success and low retention rates. Based on the work of Dawson and Guare (2016), ExS is designed to help students identify their executive functioning strengths and weaknesses through the completion of an online questionnaire which is then used to tailor a learning path specific to the students' needs. As part of the programme, students are given guidance in how to develop and retain strategic thinking skills for future tasks. The learning path consists of three or more tutorials relating to the skills that students identify as their weakest areas. Each tutorial describes the executive skill in more detail and gives practical advice on how to improve or compensate for that weakness. In addition, students are required to set a personal goal which they are encouraged to work toward.

Keywords

Executive functioning skills ; ExS ; online self-regulation tool

Introduction

College life changed dramatically on the 12th March 2020 when Irish higher education institutes (HEIs) were directed to close in order to support efforts to contain the spread of Covid-19. From that point onwards, students were advised to return home, unless it was not feasible to travel, and the remainder of the semester's teaching and assessment were conducted online. In May 2020, students at a particular higher education institute [name of institution removed for purposes of blind peer review] were invited to participate in an online survey to discuss their experiences of studying during the COVID-19 lockdown, to explore their preferences for the forthcoming academic year and to assess their current well-being (MacNeela et al., 2020). One of the main purposes of the survey was to identify sources of stress for students during the first two months of lockdown. The top-rated stressors identified by the students were exams and assignments followed by studies in general. The next highly rated stressors were related to management of daily life: employment, relationships, living situation, and finances. More than 80% of respondents reported they were concerned or very concerned about the impact COVID-19 conditions and its restrictions might have had on their interactions with peers and on their learning experience, and they further indicated that they felt stressed motivating themselves to complete tasks on time.

Restrictions will continue to be in place when HEIs reopen physical campuses again for the 2020/21 Academic Year; however, many will be offering a blended learning experience to manage the risk of COVID-19 and to safeguard public health. Consequently, students will have to be prepared for an uncertain learning environment with possible periods of self-isolation if they are known to have come in contact with the virus (Irish Universities Association, 2020). Students who have a sense of personal responsibility and are adept at self-management are more likely to succeed in this type of environment. Anecdotally, most educators have encountered students who display self-management deficits in various forms such as those who have difficulties meeting assignment deadlines; students who struggle to adjust to living away from home or being on placement; students who flit from one activity to the next without every fully finishing anything, or who have difficulties following through on well-intentioned plans; and students who only focus on the subjects that interest them and

neglect the ones they find boring. In this current pandemic climate, in order to keep on top of the learning requirements of various modules as well as other commitments, students will need to be organised and competent at judging the time required for coursework, be able to plan their time appropriately, and prioritise their competing commitments.

Those who are self-disciplined and self-motivated to initiate college work and can sustain this form of self-regulation will succeed better than those who cannot. As the COVID-19 outbreak has already shown, drastic changes could suddenly occur in order to contain the virus and students will need to be able to proactively respond to these changes. They will be required to have resilience to adjust to hitherto unknown situations, have the ability to cope with fears for the health and safety of loved ones, and adjust to living a curtailed social life. These personal cognitive skills and corresponding behaviours and habits are not only essential for navigating the stresses and strains of living during a pandemic but are also generally required for attaining success and happiness across the whole spectrum of living an independent adult life; these prerequisite skills are identified as executive functioning, or higher-order thinking skills.

Executive functioning

Executive functioning is a hugely important construct in understanding academic performance (Strait *et al.* 2019). Executive functioning resides in the brain's frontal lobe and comprises the cognitive processes that control higher order thinking skills and their associated behaviours. Dawson and Guare (2012) classify these higher order thinking skills as executive functioning skills which encompass a broad range of skills including time management, planning, task initiation, emotional control, response inhibition, and sustained attention. These executive functioning skills require conscious effort and continuous use (Diamond 2013), and if not developed or used can lead to a skill deficit and consequently to academic underperformance. Studies in the area of self-regulation, of which executive functioning skills are part of, assert that individuals are responsible for driving their own learning successes or failures through the regulation of their own thoughts, actions, and in controlling factors in the surrounding environment (Bandura, 1991). When viewed from this social-cognitive perspective, self-regulation is a cyclical process which encourages students to take control of their academic performance by utilizing strategies such as goal setting and

self-monitoring in order to achieve success. In short, self-regulation is a three-phase cycle where the first phase, also known as the forethought phase, sees self-regulated students prepare for the task by identifying the purpose of the assignment and then setting appropriate goals to succeed. It is important to note that the most successful of these students set both process and outcome goals. In the second phase, the performance phase, these self-regulated students stay focused by employing strategies which aid with concentration, motivation and relaxation. Finally, in the last phase, students use cognitive self-judgement to self-assess and identify the strategies and tactics which have led them to success or caused some problems with the recently completed task. Through this self-reflection, students can amend their approach to future tasks. In a study by Kitsantas (2002), it was noted that students with poorly developed self-regulation underperformed in tasks when compared to self-regulated ones. It was concluded that these underperforming students would require training in how to employ skills such as strategic process goal setting, self-monitoring of progress and self-evaluation. Under normal circumstances, this type of training would be delivered by an instructor in the classroom and with possible support from peers. However, with the recent pandemic, access to instructors and support networks is no longer guaranteed or feasible and this may become a source of stress for students. When under stress, such as that caused by COVID-19, the prefrontal cortex and executive functioning skills underperform or 'suffer' (Diamond 2013, p.153) leading to further exasperation of executive functioning skills deficits. An online programme which does not operate under such constraints would be one possible solution to this growing issue. Such a programme would have to continuously address executive function skills deficits while simultaneously promoting the development of self-regulation strategies as both skills sets are interrelated and dependent on three types of brain function: working memory, mental flexibility, and self-control (Centre on the Developing Child, Harvard University).

ExS

ExS is an online self-directed programme to raise students' awareness of the impact of executive functioning as a success factor and to equip students with strategies that they can use to compensate for weaker skills that contribute to a negative experience in higher education. We feel that it is important to address this, as weak executive

functioning has been linked to poor academic success and low retention rates (Alloway 2009, St. Clair & Thompson 2006, and Waber *et al* 2006). Based on the work of Dawson and Guare (2016), ExS is designed to help students identify their weaker executive function skills through the completion of an online questionnaire which is then used to tailor a learning path specific to the students' needs. As part of the programme, students are given guidance in how to develop and retain strategic thinking skills for future tasks. The learning path consists of three or more tutorials relating to the skills that students identify as their weakest areas. Each tutorial describes the executive skill in more detail and gives practical advice on how to improve or compensate for that weakness. In addition, students are required to set a personal SMART goal and develop goal-striving strategies that are likely to work for them.

The ExS programme initially evolved as a response to the lack of executive functioning skills training provided in Irish education, a shortfall that is starkly highlighted when compared to other countries. Research into the US education system would seem to suggest that the teaching of executive functioning skills, while not formally part of the curriculum, is extensively supported during the formative and adolescent years. An example of one initiative is SMARTS Online Executive Function Curriculum which is being used in over a thousand elementary and secondary level classrooms in the US (Cutler 2019) in response to students' academic performance being 'increasingly dependent on their ability to organize and prioritize complex information, shift flexibly, access working memory, and self-monitor, all critically important executive function processes' (https://smarts-ef.org/about/smarts/). However, this level of support lessens in college as executive functioning skills coaching is mainly available to students with diagnosed learning disabilities and is offered through colleges' disability services and initiatives such as College STAR (Supporting Transition Access and Retention). In comparison, very little executive functioning skills support appears to be provided in the Irish education system. The National Psychological Service has published short guides in developing executive functioning skills in children and while these guides are available on the Department of Education's website, as of yet, no formalised teaching strategy or promotion of these skills has been established in primary, secondary and higher education curricula. With the recent pandemic, there has never been more of an urgency to support students in the development of their

executive functioning skills. Currently students have disrupted or limited access to their learning and development networks and the ExS online programme is one way to offer much needed guidance. By providing training in executive functioning skills and consequently improving self-regulation, students can become better equipped to manage the uncertainties caused by COVID-19. Modules such as *Flexibility*, *Sustained Attention* and *Response Inhibition* offer students practical advice and techniques on how to navigate difficult situations thereby leading to better interactions and experiences.

The modules available on the ExS online programme have not only taken into consideration the educational needs of students but also the psychological aspects which influence learning and development. Educational psychologists from the UK-based *Connections in Mind Foundation* that specializes in executive function coaching, mentored College staff through the development of a training plan targeting module content writing and programme facilitation. The most effective intervention method to improve executive skills is through coaching which builds self-awareness, self-management and self-advocacy due to personalised goal-setting, feedback and accountability which one-on-one coaching offers. It was decided to create this tool online for a number of reasons: first, being online facilitates an intervention which allows students to develop a sense of responsibility for their own personal development and strengthen their capacity to regulate their goals autonomously; second, the vast majority of students carry smartphones nowadays and are comfortable accessing virtual learning environments and social media sites on their phone; and third, providing a programme online allows scalability that would not be possible otherwise. The ExS programme can be accessed whenever and wherever rather than face-to-face, and this is fortuitous in the current climate of requiring limited personal contact.

Testing the efficacy of ExS will commence during the 2020/21 Academic Year. The ExS project was funded by the National Forum for Teaching and Learning Enhancement and is freely available at www.exsapp.ie.

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