Learning Task #3

Resource Development and Reflection

Besart Hysniu

2022 Dec 11

(ver2: 2022 Dec 18)

EDPS 688

Aslaug Woelstad

University of Calgary

Reflections

The focus for my learning task is a study techniques resource handout for the high school student in an age of distraction. Throughout the resource, I aim to introduce the reader to evidence-based strategies using the same technologies employed by advertising companies to distract us. The unique educational opportunity today is that we live amidst a ubiquity of electronic devices that can be very useful, provided we aim them towards enhancing our focus and improving our study habits.

The digital solutions surveyed in this handout are based on evidence-based techniques that leverage the availability of digital devices that students carry with them at all times (smartphones, tablets, and computers). The study methods discussed are either directly based on the evidence regarding study approaches (i.e. effectiveness of laptop vs long-form note-taking) or provide informed solutions for studying more effectively, for creating an optimal study environment, as well to affect mental states and shaping behaviour through psychology and neuroscience research in a bid to enhance learning.

This resource was designed with the student, the parent, and the practitioner in mind; it offers research-based guidance about the study techniques in a way that is accessible to all. Advanced concepts are simplified to provide a reader-friendly resource that most of the intended audience can comfortably understand or be able to explain to students asking for help with study strategies. A unique aspect of this study resource is that it taps into the recent developments in emerging technologies that have gained popularity outside educational institutions. Most resources available through university websites appear outdated by contrast, likely due to a shift of attention by students towards popular social media content providers that have established themselves in the online space. YouTube channels under niche topics, such as peak performance,

productivity and study strategy, capture the younger student's attention in ways that now bypass a more traditional way of obtaining such information (i.e. by making an appointment with a counsellor). This teaching tool aims to bridge the gap and accommodate various levels of engagement by referencing well-researched, evidence-based study techniques. While designing this handout, I considered that students might have different comfort levels with technology. However, basic computer literacy is expected from all students, such as the ability to install and use digital applications on their favourite platforms.

Because this tool will be most helpful to students facing greater challenges with studying, I aim to capture attention with headings that announce the topic in ways that resonate with the student and the problem they face. Complex terminology is replaced with easy-to-understand instructions that make this handout a valuable tool for practitioners and parents alike to provide student support. To ensure that the technically-inclined students are included, a section at the end of the handout goes into greater depth for those eager to explore possibilities with personal knowledge management and take their organizational and study skills to the next level. The last section was an appropriate place to enter the more advanced topics, so I did not alienate or intimidate the less tech-savvy readers.

The handout is organized into three logical sections - a three-component brochure for the digital reader. The reader learns how everything from our physiology to how we study can be accounted for and leveraged through evidence-based techniques, especially when taking control of our digital devices to break free from distractions rather than our attention falling prey to them.

Aesthetically the handout was designed for a comfortable read; the illustrations deliberately space out the text throughout the page, and a double-column format is easier to

visually scan, making for an enjoyable read while enabling the student to focus on relevant information specific to their needs. The ability to visually scan subheadings and choose what to read makes this handout a good reference document for students as they gradually learn to implement the techniques. To reduce clutter, the references were indicated by a superscript index number throughout the handout, helping preserve space and making the handout more reader-friendly. The reference section on the last page lists the sources in the order presented in case the student, the parent, or the counsellor wishes to locate the relevant authority and explore further.

Understanding the underlying neural aspects of cognition and emotion was essential to building this resource. The course readings informed the resource's construction and provided a starting point for further exploration specific to the teaching tool. A good example of thought-provoking writing is Samerof's (2010) article on the proposed Unified Theory of Development, which discusses the alternation between predominantly nature or nurture explanations. An underlying message of the cited article appears to be one of a convergence of contributing factors, an equal consideration of both environmental and developmental factors in the current zeitgeist, explaining the state of the individual as "embedded in networks of relationships that constrain or encourage different aspects of individual behaviour" (Sameroff, 2010, p. 20). As future scientist-practitioners, we understand that explaining the brain-behaviour relationships entails a "Both-AND" as opposed to an "Either-OR" relationship between nature and nurture, also an overarching theme of this course, in my view. Likewise, the construction of this study skills handout acknowledges the impact of the exogenous and endogenous contributors to optimal learning. It identifies particular aspects of a student's environment and internal state that enhance or impede learning. Study skills and performance output, in my experience, appear to be effort-related at face value past a certain, typical level of ability and coincidentally parallel the

interesting finding by Barron and Harrington (1981) regarding IQ and creativity, describing a threshold beyond which the two cease to correlate. Similarly, this teaching tool aims to address behaviour that misaligns with the Bloom Taxonomy (Bloom et al., 1966) to empower the student to understand, comprehend and recall the material better through multimodal and active engagement with information (Bui & McDaniel, 2015).

Relative to the course readings, this study resource would be an excellent complement to an additional component that looks more at the impact of emotion on cognition. An example of a valuable component would be psychoeducation on Attentional Control Theory (Eysenck et al., 2007) which describes the role of anxiety on processing efficiency and how to address it using compensatory strategies. Because the teaching tool does not discuss the cross-influence of affect and cognition in the learning process, it can be considered a limitation of this resource relative to the course material. However, I point out to the reader that getting adequate sleep alone can account for the improvement in both mood and cognition. First, executive function improves with sleep (Nilsson et al., 2005), which could help most students with poor study habits. As discussed in the lecture, several brain structures underpin executive function under the hood. For example, we learned that the Dorsolateral Prefrontal Cortex is implicated in planning, organization, time management, self-monitoring and effortful attention control, and inadequate sleep disrupts DLPFC function (Krause et al., 2017). Sleep deprivation also affects brain network functionality by way of destabilizing the switching of the Default Mode Network (DMN), implicating several brain areas in the frontoparietal region that are supposed to disengage during goal-directed behaviour (De Gennaro et al., 2000; Drummond et al., 2005; Thomas et al., 2000). Lastly, the impact of sleep quality on affect is well understood (Tomaso et al., 2020); sleep

affects emotion processing (Cote et al., 2019), and the relationship is bidirectional, meaning that negative mood can reinforce poor sleep habits.

Lastly, a few words about how much I enjoyed the process - this learning task was a fun project to assemble. I am passionate about the topic and continuously seek ways to streamline my knowledge organization through digital tools. Hence I felt competent enough to share what I have learned, both during the course and outside of it (the digital tools available), and combine this knowledge into something that adds value by helping others study more effectively.

References

Barron, F., & Harrington, D. M. (1981). Creativity, intelligence, and personality. *Annual Review of Psychology*, *32*(1), 439-476. https://doi.org/10.1146/annurev.ps.32.020181.002255

Bloom, B. S., Blyth, W. A., & Krathwohl, D. R. (1966). Taxonomy of educational objectives. Handbook I: Cognitive domain. *British Journal of Educational Studies*, *14*(3), 119. https://doi.org/10.2307/3119730

Bui, D. C., & McDaniel, M. A. (2015). Enhancing learning during lecture note-taking using outlines and illustrative diagrams. *Journal of Applied Research in Memory and Cognition*, *4*(2), 129-135. https://doi.org/10.1016/j.jarmac.2015.03.002

Cote, K. A., Lustig, K. A., & MacDonald, K. J. (2019). The role of sleep in processing emotional information. *Handbook of Sleep Research*, 505-518. https://doi.org/10.1016/b978-0-12-813743-7.00033-5

De Gennaro, L., Ferrara, M., Urbani, L., & Bertini, M. (2000). Oculomotor impairment after 1 night of total sleep deprivation: A dissociation between measures of speed and accuracy. *Clinical Neurophysiology*, *111*(10), 1771-1778. https://doi.org/10.1016/s1388-2457(00)00393-x

Drummond, S. P., Bischoff-Grethe, A., Dinges, D. F., Ayalon, L., Mednick, S. C., & Meloy, M. J. (2005). The neural basis of the psychomotor vigilance task. *Sleep*. https://doi.org/10.1093/sleep/28.9.1059

Eysenck, M. W., Derakshan, N., Santos, R., & Calvo, M. G. (2007). Anxiety and cognitive performance: Attentional control theory. *Emotion*, *7*(2), 336-353. https://doi.org/10.1037/1528-3542.7.2.336

Kahn, M., Sheppes, G., & Sadeh, A. (2013). Sleep and emotions: Bidirectional links and underlying mechanisms. *International Journal of Psychophysiology*, *89*(2), 218-228. https://doi.org/10.1016/j.ijpsycho.2013.05.010

Krause, A. J., Simon, E. B., Mander, B. A., Greer, S. M., Saletin, J. M., Goldstein-Piekarski, A. N., & Walker, M. P. (2017). The sleep-deprived human brain. *Nature Reviews Neuroscience*, *18*(7), 404-418. https://doi.org/10.1038/nrn.2017.55

Nilsson, J. P., Soderstrom, M., Karlsson, A. U., Lekander, M., Akerstedt, T., Lindroth, N. E., & Axelsson, J. (2005). Less effective executive functioning after one night's sleep deprivation. *Journal of Sleep Research*, *14*(1), 1-6. https://doi.org/10.1111/j.1365-2869.2005.00442.x

Sameroff, A. (2010). A unified theory of development: A dialectic integration of nature and nurture. *Child Development*, *81*(1), 6-22. https://doi.org/10.1111/j.1467-8624.2009.01378.x

Taxonomy of educational objectives, handbook I: Cognitive domain. (2010). *Encyclopedia of Curriculum Studies*. https://doi.org/10.4135/9781412958806.n446

Thomas, M., Sing, H., Belenky, G., Holcomb, H., Mayberg, H., Dannals, R., Wagner, H., Thorne, D., Popp, K., Rowland, L., Welsh, A., Balwinski, S., & Redmond, D. (2000). Neural basis of alertness and cognitive performance impairments during sleepiness. I. Effects of 24 H of sleep deprivation on waking human regional brain activity. *Journal of Sleep Research*, *9*(4), 335-352. https://doi.org/10.1046/j.1365-2869.2000.00225.x

Tomaso, C. C., Johnson, A. B., & Nelson, T. D. (2020). The effect of sleep deprivation and restriction on mood, emotion, and emotion regulation: Three meta-analyses in one. *Sleep*, *44*(6). https://doi.org/10.1093/sleep/zsaa289