Executive Summary: The Activated Learning Project

Executive functions (EFs) are a discrete set of cognitive processes necessary for success at school and in life. Attention, flexibility, emotion regulation, planning, organization, and inhibition, for example, are known to facilitate intellectual and creative engagement.

In schools, many students stall, neglect details, or collaborate poorly. These and many other EF failures occupy teachers' attention and account for a widespread shortfall of achievement. Every student, at one time or another, is affected; people with attention deficit and hyperactivity disorder, developmental delay, autism, giftedness, learning disabilities, and fetal alcohol syndrome often demonstrate EF weakness, as do typical learners suffering from poor nutrition, lack of sleep, illness, and too much screen time (Swing, 2010). Deprivation and stress related to poverty have been shown to impair EFs as well (Hostinar, Stellern, Schaefer, Carlson, & Gunnar, 2012; Shonkoff & Garner, 2012). Unchecked, EF weakness predicts academic failure, troubled relationships, anxiety, depression, conduct disorders, health problems, risky behavior, and, eventually, incarceration (Moffitt et al., 2011). Sadly, the most vulnerable and disadvantaged struggle the most.

Experts agree that solutions are urgently needed. One of the largest longitudinal studies of EF weakness concluded that interventions yielding even small improvements to individual capacity for EFs could dramatically improve society (Moffitt et al., 2011, p. 2694). In 2018, the Bill and Melinda Gates foundation along with the Chan Zuckerberg Initiative requested information on what they consider to be the three most pressing areas for education development: math, writing, and executive function ("RFI: Advanced Education Research & Development Programs," 2018). On the front lines, a growing number of teachers are using "soft skill" or "mindset" curriculums to teach their students EF concepts, language, and specific skills. These programs are typically delivered over months of dedicated, separate lessons, sometimes entirely via computer. Maintenance and transfer of learned strategies and mindsets, however, require high-frequency practice that is embedded directly in learning (Brown, Campione, & Day, 1981; Veenman, 2007). Most researchers and interventionists, lacking authority in classroom teaching, skirt their interventions around teacher-student contact time.

Beginning my 3rd year of doctoral research, my work revolves around a novel intervention that remediates EFs by changing the essential working relationship between teacher and student. This intervention, self-designed during 18 years in the classroom and fine-tuned by teams of Ontario teachers, is a simple metacognitive conversation between teacher and students. **"Activated Learning" is a whole-class troubleshooting session that occurs multiple times a day, as needed, in which teachers stop the class, recognize that there is a specific EF challenge, and then facilitate a 5-10-minute discussion in which challenges are explored and strategies are co-created.** This, then, allows teachers to focus their feedback and assessment on noticing and naming students' strategic actions. Through teamwork and reflection, Activated Learning directly teaches and rehearses self-regulated learning – whereby students independently recognize obstacles and work strategically to overcome them.

My studies will investigate the obstacles to executive functioning that exist in status quo classrooms. I will explore the state of teacher-to-student feedback and the emotional experiences of students at risk of failure and dropout. The overarching goal is to characterize certain moderating factors missing from status quo classroom contexts that can be "patched" or debugged by Activated Learning to make everyday teaching more successful.

I am uniquely qualified to plan, conduct, and mobilize research on EFs. Five years of cooperation with two Ontario schoolboards, who are scaling Activated Learning across their teacher populations and partnering with me on large-scale studies, guarantees my access to participants. I am supervised by Dr. Rhonda Martinussen, a scholar with considerable expertise in motivation and EF, Dr. Angela Pyle, whose research is supporting the transformation of Ontario's play-based kindergartens, and Dr. Maggie Toplak who is an expert on efficient cognitive interventions. I also benefit from the advice and support of noted New York University experts Peter Gollwitzer and Gabriele Oettingen, whose research on goal attainment (Gawrilow, Morgenroth, Schultz, Oettingen, & Gollwitzer, 2013) form the basis of my approach.

Previous implementation study: In 2017, with the Trillium Lakelands District School Board, I followed 93 teachers over three timepoints with measures to determine the factors that may impact implementation of EF and strategy-oriented learning approaches such as Activated Learning. These measures included Bandura's Self-Efficacy Scale (1989), the Teacher Stress and Coping Scale (Forlin, 2001), and the Brief Resilience Scale (Smith et al., 2008). My analysis of this data is underway.

In-progress outcome study: Currently, I am working closely with the research department at the York Regional District School Board to design measures for 600 students and 24 teachers. Activated Learning training will be delivered to all participating teachers in October 2018 and pre/post data will be collected in October and May. Data collected will include student surveys of engagement, sense of personalization in learning, stigma, resilience, and optimism, as well as EF strategy use. Teachers will report on student EFs in pre/post surveys and will be interviewed at the completion of the trial to explore their sense of student engagement and mindset, as well as their own sense of control, optimism, effectiveness, and impact. Student report card results will be compared pre/post treatment, and changes further compared to the board-wide averages.

Upcoming Feedback Study: Teacher-to-student feedback practices in eight Grade 4 classrooms will be video recorded during 45 minute math lessons and analyzed for their evaluative/descriptive qualities using Tunstall and Gipps' (1996) typology. Participating teachers will be interviewed to probe their intentions and purposes. I hypothesize that the landscape of feedback within classrooms is incompatible with engagement and independence because it either drives a performance-oriented culture with evaluative feedback or suppresses student autonomy with overly controlling descriptive feedback. If I am correct, the fact that Activated Learning supplies teachers with a nomenclature for articulating descriptive, choice-oriented, autonomy supportive feedback may capture missed opportunities.

Attribution Study: 12 classes of Grade 5 students will be split into three groups: Treatment 1 (T1), T2, and control (C). Each class will complete problem-solving tasks (progressive matrices). In T1, T2, and C, after giving instructions on the task, the facilitator will lead a discussion about challenges and strategies related to the task. Prior, T1 will receive a lesson to teach the names of 11 EFs, build an appreciation of their impact on performance, and reinforce the idea that variation in EFs is natural and normal. This "EF-literacy" will then be incorporated into the challenges/strategies conversations. T2, on the other hand, will receive a prior lesson on positive thinking. C-group students will not receive prior lessons in EF-literacy or positive thinking. I am interested to see the EF-literate context created by Activated Learning may allow students to shift their attributions of success/failure towards factors they feel are normal and under their control, leading to more positive emotions, and increasing their engagement and overall success. This study will pay special attention to students who are "failure prone," defined in terms of performance worries, poor past performance, and low perceived success.

We have many good reasons to gear public education toward the optimization of EFs. There is a big difference, however, between knowing a change should happen and actually making it happen. Research suggests that, despite describe hundreds of interventions that aim to foster more strategic and capable learning (Boer, Donker-Bergstra, Kostons, Korpershoek, & van der Werf, 2013), this work has failed to make a cohesive impact on classroom practise (Dignath-van Ewijk, Dickhäuser, & Büttner, 2013; Kistner et al., 2010; Spruce & Bol, 2015). Activated Learning is designed to survive the research-to-practice divide; it does not rely on the ongoing participation of a researcher or interventionist and it is not a time-consuming curriculum. My research aims not to invent supplements to the daily activities of a classroom, such as detached computer modules, but to understand and fix the most basic processes within teacher – student interaction. The urgency and complexity of the political, social, and ecological problems we face demand a more dynamic, solution-oriented, and resilient learner. My work, in partnership with hundreds of front-line educators and decision-makers, clears a path in that direction.

Bibliography and Citations

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*, 1175–1184. doi:doi:10.1037/0003-066X.44.9.1175

Berzins, M., & Daykin, N. (2016). EFs 2 the Rescue. Retrieved from http://efs2therescue.ca/characters/

Boer, H., Donker-Bergstra, A., Kostons, D., Korpershoek, H., & van der Werf, M. (2013). Effective strategies for self-regulated learning: A meta-analysis.

Brown, A. L., Campione, J. C., & Day, J. D. (1981). Learning to learn: On training students to learn from texts. *Educational Researcher, 10*(2), 14-21.

Dignath-van Ewijk, C., Dickhäuser, O., & Büttner, G. (2013). Assessing how teachers enhance self-regulated learning: a multiperspective approach. *Journal of Cognitive Education and Psychology, 12*, 338-358.

Dweck, C. (2006). *Mindset: The new psychology of success*. New York, NY: Random House.

Forlin, C. (2001). Inclusion: Identifying potential stressors for regular class teachers. *Educational Research, 43*(3), 235-245.

Gawrilow, C., Morgenroth, K., Schultz, R., Oettingen, G., & Gollwitzer, P. (2013). Mental contrasting with implementation intentions enhances self-regulation of goal pursuit in schoolchildren at risk for ADHD. *Motivation and Emotion, 37*, 134-145. doi:10.1007/s11031-012-9288-3

Hostinar, C., Stellern, S., Schaefer, C., Carlson, S., & Gunnar, M. (2012). Associations between early life adversity and executive function in children adopted internationally from orphanages. *Proceedings of the National Academy of Sciences of the United States of America, 109*(Suppl 2), 17208-17212. doi: http://doi.org/10.1073/pnas.1121246109

Kistner, S., Rakoczy, K., Otto, B., Dignath-van Ewijk, C., Büttner, G., & Klieme, E. (2010). Promotion of self-regulated learning in classrooms: Investigating frequency, quality, and consequences for student performance. *Metacognition and Learning, 5*(2), 157–171. doi:http://dx.doi.org/10.1007/s11409-010-9055-3

Moffitt, T., Arseneault, L., Belsky, D., Dickson, N., Hancox, R., Harrington, H., . . . Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences, 108*(7), 2693-2698.

RFI: Advanced Education Research & Development Programs. (2018). Retrieved from http://k12education.gatesfoundation.org/researchanddevelopment/

Shonkoff, J., & Garner, A. (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics, 129*(1), e232-e246. doi:10.1542/peds.2011-2663

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: assessing the ability to bounce back. *International Journal of behavioural medicine, 15*(3), 194-200.

Spruce, R., & Bol, L. (2015). Teacher beliefs, knowledge, and practice of self-regulated learning. *Metacognition and Learning, 10*(2), 245–277.

Tunstall, P., & Gipps, C. (1996). Teacher feedback to young children in formative assessment: A typology. *British Educational Research Journal, 22*(4), 389-404.

Veenman, M. V. J. (2007). The assessment of metacognition: A matter of multi-method designs. *EAPA Newsletter of the European Association of Psychological Assessment, 1*, 8-9.

Research Contributions

Refereed Contributions

R Faith, L. (2018). The EFs 2 the Rescue Pedagogy. In D. Guare & P. Dawson (Eds.), *Executive skills in children and adolescents (3rd ed.)*. New York: Guilford Press.

Non-refereed Contributions

Faith, L. (July 9, 2018). Activated Learning for students with learning disabilities: A mainstream, whole-class executive function intervention that is necessary for some and good for all. Retrieved from https://www.ldatschool.ca/activated-learning/.

Faith, L. (2016). Using metaphors from nature to engage learners. *Pathways: the Ontario Journal of Outdoor Education*. *28* (3), 29-31.

Forthcoming Contributions

R DeLuca, C, Pyle, A, Braud, H, & Faith, L. (submitted). Leveraging assessment to promote kindergarten learners' independence and self-regulation within play-based classrooms. *Special issue on assessment and self-regulated learning assessment in education: Principles, policy and practice.*

R Faith, L., Bush, C, & Dawson, P. (in press). *Thinking Forward*. New York: Guilford Press.

Selected Creative Outputs

Faith, L. (2018). Activated Learning: Using EFs to reinvigorate self-regulated learning in instruction, assessment, and feedback. [lecture] *Learning Disabilities Association of Ontario*, Annual Educator's Institute, Mississauga, ON, August 21.

Faith, L. (2018). Activated Learning: A pedagogical intervention to support EF and self-regulated learning. [lecture] *Connections in Mind Summit*, The Foundling Museum, London, UK. June 14.

Faith, L. (2018). Activated Learning: A pedagogical intervention to support EF and self-regulated learning. [lecture] *EDxED NYC*, Hudson High School of Learning Technologies, NYC. June 7.

Faith, L. (2017). Executive functions-based feedback and assessment: An all-day, every-day learning skills intervention. [workshop] *Ontario Council for Exceptional Children Conference*, Marriott Hotel, Toronto, ON, November 24.

Faith, L. (2017). Executive functions-based feedback and assessment: An all-day, every-day learning skills intervention. [workshop] *Education Festival*, Wellington College, London, UK, June 22.