By Jonathan A. Bower

Personalizing Learning with Student Control vs. Algorithms

In general, the large amount of research on the subject of student agency shows that "the degree to which students learn how to control their own learning … is highly related to outcomes.[1]" Furthermore, for computer-aided instruction, "when the student is in 'control' over his or her learning … then the effects were greater than when the teacher was in 'control' over these dimensions of learning.[2]" Students who feel that they are in control of their learning are more highly motivated to do the often difficult work of acquiring a new skill like reading. Studies by Kanevsky & Keighley on student engagement show that, "Five interdependent features … distinguished boring from learning experiences: control, choice, challenge, complexity and caring teachers. The extent to which these five C's were present determined the extent of students' engagement and productivity.[3]"

Student-controlled software gives students control through choice. Students choose their own challenges across a range of complexity; for example in reading, evolving from simple alphabet activities to the application of complex analysis to text. The key item that software cannot provide is a caring teacher. That's where peer learning comes in[4]: students can share a screen with peers, who usually care about their co-learners, and with caring parents who certainly do. In this way, student-controlled software provides truly engaging and effective learning experiences.

And what about algorithms? Computer-assisted instruction is one of the many interventions studied by researcher John Hattie who found that:

- normal mental development and exposure to a teacher for a year generates an average learning gain of 0.37[5], while
- the use of computer-assisted instruction also shows a gain of exactly 0.37 per year.

Students who use algorithmically-controlled software see no benefit above students who don't!

We shouldn't be surprised. The algorithms used are rarely sophisticated enough to account for the different learning pathways of real students. As Richard Culatta says, "a model where a student is simply clicking through digital content at their own pace does not meet the criteria for personalized learning."[6] Even "Individualized Instruction" programs based on student-response algorithms do not provide a truly personalized learning experience, and as shown by Hattie's analysis if the research, do not contribute in a meaningful way to learning.

Flink Learning implements all of this best practice research by putting students in charge of their own learning in order to maximize learning outcomes. Flink Learning products are student-controlled. This means that students choose not only when and where they use them, but also, what learning activities they perform, or build – without limitations. They are free to choose any level, any activity, and to repeat activities as they wish/need. They use information about their performance on each activity, and about what they need to accomplish, to decide whether to repeat it, move on to a more difficult one, or to do something else entirely. The result is both long-term engagement and accelerated learning.

---

[1] Hattie, John. *Visible Learning: a Synthesis of Meta-Analyses Relating to Achievement*, 2009, P. 48.
[2] Ibid. P. 225.
[3] Lannie Kanevsky & Tacey Keighley. *To produce or not to produce? Understanding boredom and the honor in underachievement*, Roeper Review, Volume 26, 2003 - Issue 1, P. 20-28
[4] *See Peer Learning is Better than 1-1 Computing* by Jonathan Bower
[5] That is, an effect size of 0.37 from the school experience over one year. Effect sizes ranged from -0.3 to 1.44.
[6] Tweet: Richard Culatta,CEO, International Society for Technology in Education

For more information, contact Jon Bower at 508-641-4035 or at jon@flinklearning.com.