

# The Role of Efficacy Research in Philanthropic Funding of Education Technology

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“More philanthropic donations are channeled into education than to any other sector of American society except religion” (Zinsmeister, 2016, p. 355). From the first American college that was donor-supported in 1636, charitable contributions have been used to support multiple aspects of schools, libraries and research institutions. As philanthropies have developed what Frederick Hess and Jeffrey Henig (2015) describe as a “muscular” approach to supporting education to ensure a stronger advocacy for certain education innovations, there has also been a stronger push for funders to require and support evidence of the impact of the interventions they support. We know that both philanthropic organizations and the nonprofits they support in education want to be able to understand their influence and are building capacity to increase their abilities to measure impact. We also know that those nonprofit organizations need more help than they are currently getting in order to measure performances, from both the funding perspective and the expertise to improve evaluation.

What we don’t know as much about is which philanthropies are funding education technology interventions and how they are influencing what evidence is collected about the effectiveness and impact of those technologies. Education technology implementation is not typically the direct target of philanthropic funding, but technologies are frequently embedded in other approaches and interventions to improve

education, such as personalized or project based instruction, or 1-1 technology support. We also don't know as much as we would like about the nature of the information that the philanthropic funders are requesting that goes beyond the number of schools, teachers and students served to begin to determine the impact of those interventions in the classroom, particularly on student outcomes of performance, persistence, and success. We also need to better understand how the use of education technology improves the teaching and learning process beyond just student outcomes.

This working group was charged with examining the question of what evidence are philanthropies gathering about the efficacy of education technology interventions. First, we sought to determine which philanthropies have provided support for the explicit use of education technology in education, funding the use of platforms, services or apps in the classroom. Secondly, we interviewed a sample of foundation staff to ascertain how they characterize the evidence of the efficacy of that technology. We sought to determine the ways in which the program officers in the foundations characterized efficacy; whether it was from the perspective of rigorously measuring education technology implementation outcomes or from the perspectives of levels of evidence including utility and feasibility of technology.

## **Broader context of use of evidence in the world of philanthropy**

Philanthropies, like other organizations such as schools and nonprofits seeking to potentially invest in education technology initiatives, need to consider certain challenges before making the decision on which interventions to support. Grantees seeking access to philanthropic funding may focus on what is innovative when seeking to interest a foundation into parting with funds. They may emphasize new education technology as a solution without providing the evidence of whether or not the intervention works, especially in the context of the schools they serve.

Bill Gates, during his presentation at the 2016 ASU/GSV conference, pointed out that the challenge education has to provide evidence of what works within the education system is ongoing and needs to adopt a focus on continuous improvement. A sales model of scaling education technology is not likely to foster the collection of adequate evidence. He pointed out the growth in digital education sales that are predicted and he indicated his foundation's support for tools that improve the education opportunities of students, particularly for students in minority or low-income households.

The evidence he cited for the promise of multiple digital innovations included evidence of student performance within a study with a comparison condition. He emphasized the need for different levels of testing digital products and recognized that the time frame of studies was a challenge, not only for investors who have to think about the long game, but also for entrepreneurs and developers who will need to partner with researchers in ways that are different than they have in the past. He called for school

districts to be willing to be involved in pilot testing of education technology. Gates concluded his address by emphasizing that entrepreneurs and philanthropists, truly seeking to make meaningful changes in education, must take the lead in seeking practical solutions for the crucial problems present in education

As Frederick Hess points out in his blog in response to Bill Gates' presentation at the 2016 ASU/GSV conference, "Unfortunately, most technology in schooling has involved haphazard attempts to slather new devices across classrooms, with little vision of how or why these will make a difference." (Hess, 2016). He went further to affirm Gates' dissatisfaction with education technology stemming from investors being caught up in the excitement of companies' proposals without seeking and demanding evidence based results.

In addition to seeking practical solutions, Vanderkam (2013) speaking to an audience of charitable organizations at the Philanthropy Roundtable conference in 2013 outlined recommendations for funders seeking to make smart investments in education technology initiatives. Vanderkam's (2013) first recommendation urged the potential funder to explore his or her own personal objectives, risk tolerance and perceived value in the investment; as these were seen as the drivers for any successful investment. Those need to be addressed at the level of the strategic fit of the funding for the philanthropic organization as a whole.

Once personal interests in the project have been assessed and determined, funders are then asked to consider the intended monetary value of their giving. Smaller investments, resulting in smaller personal liability for the investor, should primarily focus on raising awareness. Vanderkam (2013), explained that there may be many players who could potentially benefit from education technology initiatives who are simply unaware of the benefits of such products. Small investments geared towards raising awareness may take the form of funding case studies to showcase successful uses of technology in schools or creating systems for providing other potential funders with valuable information about educational technology initiatives; such as existing projects and their results (Vanderkam, 2013).

Moving into larger monetary investments, Vanderkam (2013) challenged potential funders to focus their efforts and resources on conducting and translating objective research on the effectiveness of education technology products. Building or supporting organizations "that can produce objective, detailed reviews of the strengths and weaknesses of software programs and other educational technology offerings" (Vanderkam, 2013, p. 112) will give other funders access to the pertinent information needed to make potentially impactful decisions. Funding decisions, backed by sound research, have the potential to alleviate the shortcomings of the education technology industry outlined by Bill Gates as well as produce positive results for the students, educators and stakeholders involved with, and affected by, these decisions.

## Who funds research in ed-tech implementations in the classroom?

We experienced two barriers to our work as we started deliberations. The first was a common definition of what we meant by “efficacy” evidence. While the Common Guidelines for Education Research and Development (IES & NSF, 2013) initially informed our work, we became concerned that we would have little to report if the high bar of the randomized control trial was to be used. We refined our research questions to provide the opportunity for our informants to respond to questions about “efficacy research” without our definition and to elicit their own perceptions of what evidence they would wish to have collected.

The second barrier to our work emerged as we tried to identify which philanthropies are funding the implementation of education technology in the classroom. Besides some obvious actors in this field, such as the Bill and Melinda Gates Foundation, it was not immediately obvious who was directly funding education technology implementation. Many of the foundations with which we talked indicated that education technology use was frequently infused into other programmatic areas such as personalized learning or school improvement efforts. We looked through multiple sources to try to identify funders, starting with the Philanthropy RoundTable. They recommended we talk to the staff at the Foundation Center who provide much needed information about philanthropy to organizations and individuals who seek funding in the U.S. to improve the effective use of resources (<http://foundationcenter.org/>). We discussed the process by which the Foundation Center collects information about who is funding what with program officers who indicated to us that the grain size of information we needed was not available to them. We talked to staff at the Center for Effective Philanthropy who agreed that a better understanding of who was funding what in the philanthropic world would be useful information, but they did not know of a source that would quickly and systematically help identify the appropriate foundations.

We spoke to Ana Tilton at GrantMakers for Education who provided us with a list they generated in response to the question based on the organization’s long history of working with philanthropies. She indicated that a study that better characterized philanthropic funding of different areas of education was much needed. From the list generated by Ms. Tilton we collectively worked together from our own experiences to identify informants, including putting the request to the other working groups in the projects. We produced a list of approximately 40 foundations and then sought information about program officers we could directly discuss issues around the use of efficacy research and evidence in supporting foundation funding decisions. In the end, we had access and time to talk to seven program officers from six foundations who represent a cross section of large and smaller funders with some focus on education technology. We recognize that a strong limitation of the work we have done is the limited sources of information. In addition, a second limitation is the way in which our collecting

systematic evidence became more tentative as we explored conceptions of efficacy with our sources.

## Research questions

1. What do philanthropies that provide funding for educational technology want from efficacy research to help guide their project's progress through pre-funding, formative and summative evaluation processes?
2. What kinds of evidence are they using now, and how does that evidence affect their funding, evaluation, and impact assessment strategies.
3. How do philanthropies define efficacy? Is it just a measure of student achievement, or can it cover usefulness of the intervention; the degree of student engagement, time savings, and actual use; the teacher's time savings and ease of use; and the administrator's perceived return on investment and ease of implementation?
4. What kind of efficacy research philanthropies would ideally be able to gather, with an eye toward advancing the field forward?

## Interviews with philanthropic funders

We conducted interviews with these philanthropic funders of education to get some insight into the role efficacy plays in their funding decisions and program evaluations. These interviews were conducted via telephone by Bill Ferster, Edith Gummer, and Melina Uncapher, sometimes together and more often, individually. These open-ended conversations ranged in length from 35 to 50 minutes.

These organizations represent the range of foundations currently funding education in the country. They were large or small, long established to more recently founded, and focused on technology or policy. Not all of the organizations funded educational technology directly, but most had some connection to ed-tech efforts in some manner. That said, the overall issues of defining, valuing, and mandating efficacy are germane to most educationally-oriented projects and their input was insightful. Because we did not ask the program officers for permission to use their names and affiliations, we do not report those here.

## Questions asked in open interviews

The interviews were conducted over the phone and were primarily open-ended in nature. We identified a number of questions ahead of time and tried to cover them in the course of a less-guided conversation. While not all questions were appropriate for all funders, we tried to cover as many of them as the conversation allowed. These questions are listed below:

1. *What sorts of education technology use in the classroom do you fund?*
2. *What evidence do you collect that supports either your decision to fund or the impact of your funding?*
  - a. *Pre-funding decisions - Evidence informing funding decisions*
    - i. *To what extent do you require evidence of the ‘efficacy’ of an education technology intervention before you provide funding to developers/implementation?*
    - ii. *How do you define efficacy? - as a prompt, if they do not define it in the answer.*
    - iii. *Do you examine evidence from rigorous studies that include treatment and control group comparisons?*
    - iv. *What other types of evidence do you require from prospective grantees?*
  - b. *During funding decisions - Measures that provide evidence of impact that are collected during the grant process*
    - i. *To what extent do you require evidence of the impact of an education technology while the grant is in progress?*
    - ii. *Do the evaluations of the programs that you fund include evidence using a rigorous design that includes treatment and control group comparisons?*
    - iii. *What other types of evidence do you require from your grantees as they are implementing their projects?*
  - c. *Post-funding decisions – Outcome and impact measures and processes*
    - i. *To what extent do you require evidence of the impact of an education technology while the grant is in progress?*
    - ii. *Do the evaluations of the programs that you fund include evidence using a rigorous design that includes treatment and control group comparisons?*

- iii. *What other types of evidence do you require from your grantees as they are providing summative information about their work?*
  1. *What types of evidence do they typically put into their final reports?*
3. *What is the most credible evidence you seek that demonstrates the impact of ed-tech interventions that you've funded?*
4. *How do you disseminate the evidence that is provided to you?*
  - a. *Do you require grantees to publish their findings in peer-reviewed journals if they can? In self-published reports? What dissemination strategies do you require or recommend?*
  - b. *Do you publish the findings in white papers and reports?*
  - c. *What web-based mechanisms do you require or post on your foundation websites?*

## Findings

### **1. Which philanthropies provide funding for classroom educational technology? What kinds of evidence are they using now, and how does that evidence affect their funding, evaluation, and impact assessment strategies.**

The program officers we spoke did not use much explicit efficacy research to inform their funding or assess impact. There was however, a stronger interest in outcomes when it came renewals for many of the foundations, than initial funding decisions. This is understandable because many of the projects they fund are startups, which typically do not have hand history to draw measurements from.

*“What we look at when we renew a grant are both outcomes data if they have it and sort of also progress towards overall goals. And we look at partnership strength. Are they transparent partners? Do they bring new challenges to us? Are they good partners in that way? And then we also look at evidence of data-driven decision making for continuous improvement. So, are they iterating and improving on their work and based on what.”*

Another issue is just how different the various entities that these philanthropic organizations fund are:

*“Part of the complexity is just that the products that these companies offer are all different. It's hard to compare apples to apples between the types of companies we've invested in.”*

There was a recognition of the different roles that the funding is provided for, as an equity investment or a grant, and that role may restrict the kind of demands or feedback the institution can make on the organization they fund.

*“When you're investing as an equity investor, you don't dictate where the money goes necessarily. You can have influence just in your diligence bar, set criteria of what level of analysis the company needs to have done beforehand. When you take a stake in a company it's not like where you can [dictate that] ... you can do grants and say we're explicitly funding you and setting this money aside for research and evaluation of your product which is probably an easier path than if you're an equity investor in a company where the influence you have on where funding goes is a little bit different after you clear that diligence process. They would have to be based on the diligence process. It would have to be worth the company's time to make that upfront investment if you're thinking about it from an equity lens. From a grant lens it's an easier path.”*

## **2. What do philanthropies that provide funding for educational technology want from efficacy research to help guide their project's progress through pre-funding, formative and summative evaluation processes?**

The short answer is no. The program officers generally did not require efficacy studies from their fundees. It is not that there are no expectations or outputs and outcomes that are associated with philanthropic funding:

*“Our performance measures are in our grant agreements with our grantees. And certainly any grant that is longer than 18 months has multiple payments associated with it, generally, and our payments are contingent on progress toward those performance measures.”*

Nor did the respondents indicate that they didn't value the potential evidence that efficacy measurement and reporting through rigorous research or evaluation studies might offer. However, the conditions under which most grantees worked precluded the potential for evidence of a causal nature. The program officers indicated limitations in evaluation due to the lack of valid and reliable outcome measures and instruments, the uniqueness frequently exhibited by the specific contexts in which their multiple projects operated, and the overall complexity in parsing out causal relationships posed an obstacle for most of the interviewees. More details on these factors is outlined in the sections that follow.

## **3. How do philanthropies define efficacy. Is it just a measure of student achievement, or can it cover usefulness of the intervention; the degree of student engagement, time savings, and actual use; the teacher's time savings and ease of use; and the administrator's perceived return on**

## investment and ease of implementation?

All of the program officers valued student achievement as the primary measure of efficacy, and all but one took a broader look at other kinds of outcomes to measure their project's success, such as use, time on task, student engagement, teacher engagement, savings of teacher and administrator time.

*“Efficacy for me is, means only one thing: Are the students doing better? [it's] the only measure. And we don't have a way of actually doing that yet.”*

*“I do think that Pearson's spent some time actually with the idea that efficacy is a framework. It's not a single type of study. To a certain extent I think that the common guidelines in using the term efficacy to be one of those impact studies has done something of a disservice to the field. I think we would have been better off if we'd left the term efficacy out and recognized that it's going to be multiply defined.”*

*“One is that you're seeing increasing student learning outcomes on, like academic tests for example. That might be being able to look at a math score and see that there has been improvement when using this technology. We're also looking at engagement, because we have read research that shows that like if students are engaged they're likely to kind of stick with it a little bit longer. We're also looking at kind of inclusion. ... . So kind of that cultural relevancy. Teacher satisfaction, also habits of mind, like growth mindset, we think that is also another important indicator.”*

Before addressing the issues of efficacy, some expressed the need to collect information about the use and demographics of the intervention:

*“Are the tools reaching the teachers and the students in the classrooms that we want?” “How do we get good insight into usage and demographics of population served?”*

All recognized the difficulty in evaluating efforts for causal factors in the real world classroom environment, and program officers uniformly expressed frustration in their inability to isolate causal factors.

*“It gets hard to really tease apart.”*

*“It's hard to isolate what the literal impact of a tool on student learning is because there's so much else going on conceptually.”*

*“I think what the hardest part of all of this is that efficacy is not binary. The actual answer to whether or not a product works most likely is dependent on the circumstances meaning like the level of experience as a teacher, the*

*particular instructional model, etcetera, etcetera. It's not that you need one efficacy study to get schools to demand it's more that you probably need a dozen or more to actually be able to help them figure out whether or not a particular tool can help their kids which is where I think this idea of supporting rapid upfront pilots for schools may actually hold at least as much promise as studies that have been done elsewhere, if that makes any sense, in helping the schools to understand what the potential is and how they should be thinking about their expectations and tools that are being used in their particular district."*

*"Also not all of these tools are linked to provide a complete experience all the way from assessment through instructions."*

*"So at the individual grant level, we are less concerned about having that kind of causal claims coming out of work, or coming out of the work of the grantees."*

*"I have real concerns about some of the perverse incentives that having just a simplistic frame of 'has this improved student outcomes' can create in the field. Particularly when we're at what feels like a somewhat tenuous place in our continued, innovative, developmental cycle. Just meaning that right now, I think that one of, if not the primary concern of practitioners and school developers who are undertaking this kind of work has to be building the evidence base and building our understanding of what the relationship between some of these changes in how we design our schools, how we organize teacher-student relationship, the different kinds of education technology that we're employing in classrooms."*

Recognizing the difficulty in directly assessing efficacy, most funders opt to use indirect indicators of a program's success.

*"We look for proxies of efficacy and quality. Certainly the proxies will not be full studies of efficacy but we look for proxies of user feedback and the like... A lot of it is quite frankly anecdotal. It's going to kick the tires in classrooms where the tool is used. It's talking to customers. It's looking at ... It's getting a good sense just at the philosophy of a company, how they position in the sense of get insight from teachers and educators and whomever is using said tool. A lot of it is light and anecdotal feedback."*

*"Engaged New York has already been reviewed by Ed Reports and we know that it's highly aligned to the Common Core and so, we kind of use that as like a way to say, "Okay, this is probably high quality, let me go investigate this in the classroom. Let me interview teachers, let me interview principals. Let me see some of the data that they are able to collect in the field and kind of understand the growth."*

*“So sometimes that's an intermediate step toward student outcomes, right? Like, sometimes it might be, we as an organization are going to undertake a set of professional development activities and the intended audience are teachers who are going to be employing more differentiation in their classroom, utilizing the technology platform that we've developed. The theory is changed that the grantee articulates will probably present that change in teacher practice as an intermediate step toward ultimately improving student outcomes. But we want the performance measure to be something that can be realistically obtained within the grant period. So, what we would probably do in this hypothetical example that I'm giving you, is say something like, x percentage of teachers will show demonstrated improvement in classroom practice along the dimension of differentiation as measured by the following rubric, or something like that.”*

*“I would almost rather that a grantee have less ambitious goals around student achievement if they can do a better job of elaborating on what the intervening steps and changes and challenges they expect to have in getting toward that end.”*

Finally, the some funders wisely chose to keep the measurements as close as possible to the actual intervention, rather than looking for effects that may or may not ripple out from them.

*“The most proximal audience for whatever the proposed work is so that we can then kind of go outward through the different layers of the onion and understand at each juncture whether the dominoes are falling in quite the way we imagined they would. .. we wouldn't want a grantee to be satisfied with just changing teacher practice if it never had any impact on student achievement.”*

#### **4. What kind of efficacy research philanthropies would ideally be able to gather, with an eye toward advancing the field forward?**

When asked whether or not a more systematic mechanism for evaluating efficacy would be helpful, opinions were mixed.

*“The concept is attractive ... People for the most part have the right intent and I think want to make sure the product they're selling works and has positive outcomes. The challenge just becomes what the ... process looks like.”*

*“This has all been very new to us and it's been more like, Well we were unsatisfied with some of the longer, more established research that we've gotten in the past and what can we do from a rapid cycle perspective? “*

*“I would love to land in terms of an overarching evaluation strategy. We have not invested a tremendous amount of dollars into evaluation historically, with the exception of some major initiative that we’ve undertaken. “*

*“I would love to just have research that was really accessible to teachers or administrators that you don’t have to be a researcher to read it. That you could get in you know small, bite-sized chunks and then for the researchers that want to find out, they could click into the 50-page analysis behind it.”*

## **Barriers to gathering efficacy or causal evidence of funding**

Turnover in philanthropy staff is as relevant as turnover in fundraising organizations. While much of the research on turnover in fundraising staff has focused on the non-profit organizations who seek funding, anecdotes abound about the turnover in philanthropies. The result of this is that institutional memory about the projects that have been funded can be lacking. When program officers don’t know what they have funded in the past, they do not know what historical evidence might be available on which they could build. These program officers typically handle 20 to 40 projects simultaneously, and their attention is necessarily divided among the competing projects.

The technical information needed for rigorous impact studies is another barrier to the collection of efficacy evidence from foundation funding. Foundation program officers may lack depth in the fundamentals of efficacy studies, or empirical research. They are frequently focused on getting funding to grantees and are dealing with the use of interventions in complex contexts where the implementation of education technology is only a small part of the project. Funding for complex evaluations must compete with funding for programs, and the delivery of services is frequently more important than gathering evidence of impacts. In addition, many non-profits who receive foundation funding do not have the capacity in-house to conduct sophisticated impact studies. They are focused on carrying out projects, providing support to the schools and classrooms with whom they work. Grantees struggle to measure outputs not outcomes, because those are within their capacity and funding for evaluation (think usage not student outcomes).

Finally, as organizations, philanthropic funders struggle with risk aversion and are reluctant to take poor or inconclusive results to their boards. The preponderance of studies on the use of media and/or technology do not show significant gains in student achievement, at least in regards to what the assessments are assessing. As far back as 1928, studies that measured the effectiveness of the correspondence schools reported, “no differences in test scores of college classroom and correspondence study students enrolled in the same subjects.” (Crump, 1928)

Education researcher Thomas Russell published a slim book in 1999 which looked at 355

media comparison studies, all of which yielded no significant difference results, and found a number of other potential benefits that technology and media could potentially offer beyond better economics, including that the number of course offerings made available could be substantially increased; courses could be rapidly provided to fulfill specific instructional needs; and finally, that media and technology solutions can serve large and small populations with the same basic offering (Russell,1999).

The Institute of Education Studies within the U.S. Department of Education ran a similar study of ed-tech products during the 2005-2009 timeframe using large random assignment (Institute of Education Sciences, 2009).

## Conclusions

It is clear from our conversations with funders that their definition of what constituted efficacy was different from institution to institution. Most seemed to value the measure of student achievement to be the ultimate gauge of whether or not a given intervention is deemed successful.

There was uniform recognition among the six program officers that because the interventions funded were seldom all-controlling and short in length, include education technology as only one component in a context that does not provide conditions for strong comparisons, it was hard to prove any direct or causal relationship between the intervention and student achievement. To compensate for this, when they did use any measures of efficacy, those methods were typically indirect.

These typically were comprised of things they could actually measure in some manner, and ranged from measuring student or classroom use of the tool, time savings for the student, teacher, or administrator, or more qualitative measures, such as surveys of engagement and satisfaction of the various stakeholders.

Some institutions sought to make their measurement as proximal to the nature of the intervention themselves. For example, if the intervention comprised of professional development of the teacher, the assessment sought to measure the efficacy of the development, rather than its highly diffused later impact on student achievement down the line.

Perhaps because of these inabilities in definition and causation, institutions did not have any formal mechanism in place to mandate the use of more formal efficacy measurement in either their initial or continuation funding decisions.

## Recommendations for future research

It is quite clear from the work of this group, that the information is quite thin about how philanthropy might support the collection of better data on the impact of its funding of education technology. Several recommendations have emerged:

1. The wider community would benefit from better information about how education technology support is distributed across the education scene. A more systematic study of how education technology products are integrated with other funding initiatives is clearly needed. This information, perhaps in the form of a clearinghouse of who is funding what under which conditions would be a useful source of information for philanthropic organizations as they seek to identify what is the best investment they can make for schools and districts. The education technology development community would benefit from better understanding how their education technology product would fit into larger efforts to improve and innovate education systems. And researchers would have a better understanding of how the context for more rigorous work would be made explicit if they knew were different products were being implemented.
2. A public-private partnership around studying the connection of implementation efforts with the research and development of education technology products would bring together federal, state, philanthropic and district/school efforts. We have strong evidence that education technology products, by themselves, are unlikely to produce the evidence of the promise of improving student outcomes. Efforts to build the networks, such as the Gates Pilot Projects coordinated through the Learning Assembly and LEAP Innovations, and the Education Innovation Cluster work of Digital Promise and the ED Office of Education Technology are examples of how this work might proceed with direct connections to schools and districts. Having philanthropies and the federal government work together to support this work is crucial.
3. Having education technology efficacy a focus of the philanthropic support of the education accelerators and incubators around the country that was systematic across funding organizations might also coordinate efforts. A group such as Grantmakers for Education or the Philanthropy Roundtable might facilitate such coordination.

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