Making Data Work for Low-Income, Lower-Skilled, Unemployed, and Underemployed Individuals

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About this brief

Making Data Work for Low-Income, Lower-Skilled, Unemployed, and Underemployed Individuals seeks to identify potentially successful approaches to help fulfill the transformational promise of big data in the education realm for these key populations. It draws on available research about using data and information to reach the target groups, as well as background information about technology use and human decision making. The accompanying one-pager distills this brief and recommendations for impacting target audiences.

The author, Patrick Lane, is vice president for policy analysis and research at the Western Interstate Commission for Higher Education (WICHE), an organization that has worked to facilitate cross-state data sharing of education and employment data in addition to other efforts to improve access to and success in postsecondary education. Information contained in this brief is drawn from lessons learned during the Multistate Longitudinal Data Exchange Effort as well as general research. The views presented in this brief are those of the author.

About Data for the American Dream

Data for the American Dream (D4AD) is a consortium bringing together Schmidt Futures, Lumina Foundation, Walmart Foundation, and the Walton Family Foundation. D4AD currently funds pilot initiatives in three states (Colorado, Michigan, and New Jersey) that will help provide low-income, lower-skilled, underemployed, and unemployed workers access current and actionable data, enlisting local case managers from public and private agencies to counsel job seekers, help them access needed services, and reach the most underserved populations.

The National Center for Higher Education Management Systems (NCHEMS) is the implementation partner of D4AD. NCHEMS is a private nonprofit organization whose mission is to improve strategic decision making in postsecondary education for states, systems, institutions, and workforce development organizations in the United States and abroad.

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Introduction

Data and information sources abound in today's world. Through smartphones, tablets, and the ubiquity of the internet, people have access to more information — literally at their fingertips — than ever before. And the trend is here to stay. But does this seemingly limitless amount of information help all groups of people equally?

It is a question with notable implications for low-income, lower-skilled, unemployed, and underemployed people making critical decisions about their education and career paths.

State agencies and others have developed resources that show earnings of graduates following different pathways, while the federal government has produced a web tool with substantial information about professional outcomes for postsecondary students. Yet many data gaps remain and it is not yet clear that these resources are benefiting low-income, lower-skilled, unemployed, and underemployed individuals – groups that have been left behind in many ways by our education and training systems.

The *Data for the American Dream,* or *D4AD,* initiative provides seed funding through grants to projects that aim to provide clear data and information about how education and training programs intersect with career opportunities. Grantee organizations are being tasked with filling in gaps in the already formidable universe of information — a task that will require technological innovation, close attention to data governance, and a strong commitment to data security and individual privacy.

Grantees will also have to address a central question: What is the best way to curate and deploy this newly developed information to impact the lives of individuals who have not generally been well-served by our education and training systems, particularly those from low-income backgrounds, those who are lower-skilled, and those who are unemployed or underemployed?

This brief seeks to identify potentially successful approaches to help fulfill the transformational promise of big data in the education realm for these key populations. It draws on available research about using data and information to reach the target groups, as well as background information about technology use and human decision making. While there is limited research that is directly relevant to the specific data tools and information envisioned as part of the *D4AD* effort, there has been some research examining the impact of data and information on the behavior and choices of low-income individuals and others within the populations of interest.

The goal of this brief is to provide context and background that can help guide implementation of successful efforts aiming to reach low-income, lower-skilled, unemployed, and

underemployed adults and students. While this brief focuses on projects that will be carried out as part of *D4AD,* ideally it will be useful for all those working in this space.

The key takeaway from this research is that merely presenting new consumer information on a website or through an app is not likely to have strong positive impacts that will lead low-income, lower-skilled, unemployed, or underemployed individuals to change how they make decisions about education, training, and employment. Successful efforts will have to be intentional in devising ways to ensure usage of new data and information: Key strategies in related domains include utilizing intermediaries to present information to populations of interest, leveraging existing platforms that may already be well-used, and pairing information with assistance in navigating the complex process of reengaging with the education and training sectors.

Background

D4AD is funding collaborative efforts that focus on providing low-income, lower-skilled, unemployed, and underemployed individuals access to better data about education and training opportunities. Such resources will help enable full employment and economic security.

The scope of the initiative raises two key questions, one of which will be acknowledged but will not be the focus of the rest of the discussion. First, what data are needed and how will they be compiled? Second, how will those data, once assembled, be translated into usable and actionable information for the populations of interest?

The first question leads quickly to complex discussions about data governance, allowable uses of data, legal implications, and technological innovation. These issues are obviously important, but not the focus of this limited brief. However, considerations about the type of information that grantees will seek to use to change individual behavior are helpful in framing further discussion and examining available research.

Generally speaking, grantees in the *D4AD* effort are being asked to provide better information about available education and training opportunities that link to good long-term employment opportunities. This includes information about the labor-market outcomes of those who pursue those opportunities, as well as information about available jobs and developing occupational pathways that are likely to provide economic security in the future.

During the initiative, grantees will be working to create the necessary data linkages and develop the raw data and information about opportunities and outcomes, itself an extraordinarily complex task. However, successfully completing this part of the work is just the first step. Filling these data gaps would be an admirable feat, but not necessarily impactful without substantial attention paid to ways of utilizing these data to help populations of interest make the best decisions about their education and training.

Before focusing in detail on existing research related to the second question raised above, it is helpful to examine some data and research that can help frame discussions about how best to use consumer information to optimize behavior.

Access to internet and technology. One fact evident through many different metrics is that access to and use of the internet varies by income level. Research shows that about 80% of individuals with incomes below $30,000 use the internet, compared to 98% of high-income individuals.[1] Data disaggregated by age show, however, that this may be a generational phenomenon as 98% of individuals between 18 and 29 use the internet. But broadband access — key to accessing and using more complex web tools — shows starker divides, with 45% of low-income adults having broadband at home, compared to 87% of high-income adults.[2] While there are slight differences by age on this metric, they are not nearly as pronounced as internet access, with about two-thirds of younger individuals having home broadband, a comparable figure to older working-age populations.[3] Notably, the data show home broadband usage has slightly declined across most demographics in recent years, perhaps due to more individuals relying solely on smartphones.[4]

Smartphone usage. One potential avenue for reaching low-income, lower-skilled, unemployed, and underemployed individuals is through applications designed to operate on smartphones and/or tablets. Similar to internet usage, this potential pathway operates on the assumption that the populations of interest own and use smartphones capable of running these applications.

Research again tells a mixed story about the prevalence of smartphones. There is a divide in smartphone ownership by age range with, as might be expected, younger adults being much more likely to own one than older adults.[5] However, there are also divides in smartphone ownership by education level and income. Eighty percent of adults with some college education but no degree own a smartphone (compared to 91% of college graduates), while only 69% of those with a high school diploma as their highest credential own one.[6] Similarly, only 67% of those earning less than $30,000 own one, compared to 93% of those earning more than $75,000 annually.[7] Further complicating the story, low-income adults and those with lower education levels are more likely to be dependent on smartphones for internet access.[8]

Other data show that individuals with lower education levels are more likely to use their smartphones for crucial job search components, such as writing cover letters (33%) or filling out

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[1] Pew Research Center. “Internet/Broadband Factsheet.” https://www.pewinternet.org/fact-sheet/internet-broadband/

[2] Ibid.

[3] Ibid.

[4] Ibid.

[5] Pew Research Center. “Mobile Fact Sheet.” https://www.pewinternet.org/fact-sheet/mobile/

[6] Ibid.

[7] Ibid.

[8] Ibid.

job applications (67%), than adults with higher levels of education.[9] This further underscores the fact that a reasonable proportion of the population of interest for this work is dependent on smartphones for most internet-related tasks.

The implications from these findings are somewhat ambiguous, but suggest that approaches relying on web-based tools should be made available on a variety of platforms, including websites aimed at computer users and applications aimed at smartphone users.

Data driven decision making. The image of humans as rational computational machines that, when given complete information, make optimal decisions may be comforting, but is also somewhat divorced from reality. Research has repeatedly shown that humans are imperfect at making decisions even when given accurate and complete information.

One classic experiment asked study participants to choose between different treatment options for a hypothetical disease affecting a group of 600 people.[10] The first group of participants was told one treatment would save 200 lives while the other treatment had a two in three chance of saving no one. Participants in this group favored the first treatment option. Participants in the second group were faced with the same choice, but told that the first treatment would result in 400 deaths. Even though the data, information, and numbers all indicate that identical numbers would live and die as in the first option presented to the first group, participants in the second group overwhelmingly favored the second option — choosing a treatment with a two out of three chance of saving no one.

This study has been replicated in other scenarios and with other populations confirming that humans do not always rationally evaluate numbers and data to reach decisions. Studies even show similar effects with individuals who are considered well-versed in their respective fields (for example, physicians also favor medical treatments where survival rates are presented over those where death rates are shared, even when the potential outcomes are identical).[11]

This research provides insight into human decision making, and its implications for developing data resources to guide the population of interest are important. And it demonstrates that how we frame data about education, training, and career pathways is just as important as the data itself. This has relevance for the discussion and presentation of costs, debt loads, financial aid, job opportunities, and student/trainee outcomes. Because, generally speaking, humans appear to favor information that is presented in a positive light, it is reasonable to conclude that information about cost (a negative) presented as part of a discussion of returns on investment (a positive) could be more likely to sway populations of interest to engage in schooling or training.

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[9] Smith. “Job Search in the Digital Age.” Washington, DC: Pew Research Center (2015).

[10] Tversky and Kahneman. "The framing of decisions and the psychology of choice." Science 211, no. 4481 (1981): 453-458.

[11] Bui, Krieger, and Blumenthal-Barby. "Framing effects on physicians' judgment and decision making." Psychological reports 117, no. 2 (2015): 508-522.

Existing research on outreach and information interventions

There are already several different federal and state data resources that present users with information about potential earnings, costs, success rates, and other metrics associated with various postsecondary education programs. These resources include the College Scorecard, a federal tool launched in 2015 that shows various metrics for federal student aid recipients by institution, as well as numerous state sites that show similar information. Research that has examined the impact of website information and web tools on student behavior generally shows that the existence of such information alone does not change behavior — such as program selection or attendance at particular institutions — for low-income individuals.[12]

Before turning to research that specifically examines how information about postsecondary education and training can be successfully disseminated to the population of interest, some consideration about the general process by which different sub-populations gather information is useful. As one example, research suggests that individuals with lower educational attainment levels engage in substantially less information search when considering major financial decisions.[13] Research also indicates that low-income individuals possess less information about postsecondary options than wealthier peers.[14] While tools and websites focused exclusively on degree-granting postsecondary education programs are not necessarily the primary focus of the *D4AD* effort, lessons learned from these efforts can certainly be instructive.

The College Scorecard is designed as a consumer information tool for students and their families to weigh costs, earnings of graduates, completion rates, and other factors when considering whether and where to enroll for postsecondary education.[15] An Urban Institute study from 2017 evaluated the use of a consumer information tool based on data from the College Scorecard with high school students, but found no evidence that it changed student behavior.[16] Based on their research, study authors recommend that tools aiming to change behavior through this type of information attempt to integrate within existing advising tools that students already use, and that state and federal governments should focus on increasing availability and usability of data by third-party intermediaries and other organizations.[17]

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[12] Chen, I., G. Choi, and B. Schneider. "Providing Opportunities with Technology to Support Traditionally Disadvantaged Students: Examining College Ambition Program." *American Education Research Association* (2018). Bird, Kelli A., Benjamin L. Castleman, Jeffrey T. Denning, Joshua Goodman, Cait Lamberton, and Kelly Ochs Rosinger. *Nudging at scale: Experimental evidence from FAFSA completion campaigns*. No. w26158. National Bureau of Economic Research, 2019.

[13] Whitsett and Allison. "College Information Design and Delivery." Washington, DC: Young Invincibles (2015).

[14] Page and Scott-Clayton. "Improving college access in the United States: Barriers and policy responses." Economics of Education Review 51 (2016): 4-22.

[15] United States Department of Education. “College Scorecard Communications Toolkit.” Retrieved from https://collegescorecard.ed.gov/assets/College-Scorecard-Toolkit.pdf on April 12, 2019.

[16] Blagg, Chingos, Graves, Nicotera, and Shaw. "Rethinking Consumer Information in Higher Education." Washington, DC: Urban Institute (2017).

[17] Ibid.

Additionally, the authors recommend market testing communication efforts designed to highlight program quality because the demand for tools, how and where they will be used, and other key needs can vary substantially by context and population of interest.[18]

These findings echo results of other research aimed at understanding how information on outcomes like earnings can affect student choices. To generalize a variety of different studies, it appears that merely providing information (even when it is directly provided to students) has limited impacts on behavior or choices, particularly for low-income students.

These findings include research showing that the introduction of the College Scorecard led to students sending more SAT scores to institutions with higher reported median earnings, but this change was driven primarily by students from private schools.[19] This is likely a different group of students than the population of interest for *D4AD.*

Research on undermatching may also be relevant to *D4AD* efforts as much of the work has aimed to change the behavior of high-achieving low-income students through informational interventions.[20] One particular intervention that successfully changed student behavior (as evaluated through an experimental design) shows the importance of driving information beyond a passive presentation on a website. This work found that the information successfully changed student behavior (leading this group of students to apply to different types of postsecondary institutions than their untreated peers) when it was coupled with additional supports, detailed and customized information, assistance in completing required paperwork, and fee waivers.[21]

Looking more closely at the populations of interest for the *D4AD* effort, research has evaluated approaches to encouraging recipients of unemployment insurance (UI) to engage in postsecondary education and training. During the Great Recession, the federal Departments of Education and Labor encouraged states to send information about postsecondary education to UI recipients. Research found that letters about Pell Grants as a potential way to reduce costs increased the likelihood of enrollment by four percentage points in the six months after individuals received the letters.[22] The research further concludes that information alone may not be sufficient to change behavior, but there is reasonably strong evidence that linking information with assistance in completing the tasks necessary to enter postsecondary education can improve outcomes of the populations of interest.[23]

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[18] Ibid.

[19] Hurwitz and Smith. "Student responsiveness to earnings data in the College Scorecard." Economic Inquiry 56, no. 2 (2018): 1220-1243.

[20] This brief acknowledges that there are robust debates about the issue of undermatching. It is included here solely for purposes of discussion about effective informational approaches to change student behavior.

[21] Hoxby and Turner. "Expanding college opportunities for high-achieving, low income students (SIEPR Discussion Paper No. 12-014)." Stanford Institute for Economic Policy Research, Stanford University (2014).

[22] Barr and Turner. "A Letter and Encouragement: Does Information Increase Postsecondary Enrollment of UI Recipients?" American Economic Journal: Economic Policy 10, no. 3 (2018): 42-68.

[23] Ibid.

Interventions focused on low-income adults also found that offers of assistance from tax preparers in completing financial aid forms greatly increased the rate at which these individuals submitted the Free Application for Federal Student Aid (FAFSA) forms and subsequent enrollment in postsecondary education.[24] In this study, an additional group of adults received information about their eligibility for financial aid (but no offers of assistance. For the second group, the rates of FAFSA completion and submission did not differ from the control group.[25]

The ineffectiveness of information-only campaigns is also evident in research in other domains. An evaluation of providing performance data of health insurers to Medicaid recipients shows that this by itself is unlikely to lead to more participants enrolling with better performing providers.[26]

Although many of these studies and evaluations deal with slightly different populations and interventions than what is envisioned as part of *D4AD*, the implications and conclusions likely still hold true. Information-only efforts will be ineffective unless matched with efforts to assist low-income, lower-skilled, unemployed, and underemployed individuals get on a pathway to a financially secure future.

Use of intermediaries and additional assistance

Building on these findings that informational interventions by themselves may not be effective at leading low-income, lower-skilled, unemployed, and underemployed adults to enroll in high-quality training or postsecondary opportunities, there is another vein of research that can provide guidance. Several studies in a variety of fields have found that using intermediaries — whether organizations, individuals, or technological tools — can be an effective way to transmit information to individuals and get them to act.

As a first step, general research on consumer information search processes suggests that by using intermediaries, individuals engage in a broader search process.[27] Intermediaries can also provide direct assistance, as in the tax preparation example above. Alternatively, assistance that utilizes new data and information can be provided directly through living or virtual intermediaries, including one-stop shops, advisors and counselors, and text messaging platforms.

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[24] Bettinger, Terry Long, Oreopoulos, and Sanbonmatsu. "The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment." The Quarterly Journal of Economics 127, no. 3 (2012): 1205-1242.

[25] Ibid.

[26] Farley, Short, Elliott, Kanouse, Brown, and Hays. "Effects of CAHPS health plan performance information on plan choices by New Jersey Medicaid beneficiaries." Health Services Research 37, no. 4 (2002): 985-1007.

[27] Lee and Cho. "Consumers' use of information intermediaries and the impact on their information search behavior in the financial market." Journal of Consumer Affairs 39, no. 1 (2005): 95-120.

In recent years, a deep thread of research has identified how informational "nudges" can help improve postsecondary matriculation rates.[28] Some of this work has shown improved college-going rates among low-income students due to text messages sent to potential students during summer months. These messages included reminders of important due dates and the opportunity to connect with advisors for assistance. In a similar vein, one could imagine a system targeting the population of interest with informational nudges about both the benefits of training or degree programs along with assistance in connecting with needed resources.

Evidence of non-human intermediaries show effectiveness as well. A randomized experiment in Scotland provided groups of job seekers with either a standard job search engine, or one that makes recommendations based on individual preferences, pulling in household survey data on pathways between jobs as well as skill transfer to help guide the job search process.[29] Individuals receiving this enhanced job search — effectively an intermediary that combines substantial data behind the scenes — broadened their job search and received more job interviews and, ultimately, more job offers.[30]

Intermediaries can be a big, diverse group and include live humans as well as technological innovations. One-stop shops, employment counselors, and others from government agencies could be key actors in helping low-income, lower-skilled, unemployed, and underemployed individuals find fruitful education and training opportunities as well as economically secure career paths. Community-based organizations are another key potential resource, as are employers. Any of these entities (and many others) can distill the complicated data about differing options and refine them into relatively straightforward options while helping the population of interest navigate a complicated process.

Conclusions and recommendations: If you build it, will they come?

The innovation, dedication, and effort that is evident in the varied efforts to improve the data landscape for those who may benefit from new workforce training or postsecondary education to provide economically secure futures is awe inspiring. Yet one of the key questions about new websites, apps, and data tools harkens back to *Field of Dreams*, in which mysterious voices inform Kevin Costner, "If you build it, they will come."

Reality, unfortunately, is somewhat more complicated than Hollywood would have us believe. If Kevin Costner had been building a longitudinal data resource (a blockbuster for sure), the mysterious voice would have undoubtedly added numerous caveats and conditions. Existing

[28] See for example Castleman and Page. "The not-so-lazy days of summer: Experimental interventions to increase college entry among low-income high school graduates." New directions for youth development 2013, no. 140 (2013): 77-97.

[29] Belot, Kircher, and Muller. "How low-cost labour market information benefits job seekers." (2016).

[30] Ibid.

research from a variety of domains shows clearly that "building it" will not be enough. The research summarized above suggests that developing a new data resource is only the first (albeit complicated) step.

The studies and research discussed here give rise to five recommended strategies to make newly developed data and information sources more effective in connecting low-income, lower-skilled, unemployed, and underemployed individuals to promising education and training opportunities as well as economically secure career pathways. Certainly not every new tool developed can be perfect in every one of these areas, but intentional efforts can result in tools and resources that serve the populations of interest.

1. **Utilize market research and continuous improvement processes to adjust and revise data and information tools.** This may be a relatively straightforward recommendation, but it's also likely one of the most important. With continuously evolving technology, new career opportunities and pathways, new training programs, and potentially changing audiences, hard and fast "rules" may change quickly. Efforts attempting to drive individual behavior through better information and services must base their work on strong market research. Designers and developers should produce tools that resonate with the population of interest, not necessarily those preferred by funders, policymakers, or organizational leadership. These efforts must also set up processes to continuously evaluate and adjust their tools, building on what works and revising what does not. Market research and focus groups can also provide direction on how choices and data and information are framed in order to optimize resources. A careful understanding of the way the target population is likely to access and use information tools is crucial for developing resources that will serve them effectively. Sufficient attention in energy and resources to this task is needed, as is a bias for adapting tools to account for what is learned from these efforts.

2. **Improve data and information on currently used resources.** If platforms already exist that could serve the population of interest but they lack the necessary data resources, it may be more effective to improve these platforms rather than to build a new tool that may not be as widely used and will have to develop an audience. Solutions can also provide access to data through an application programming interface (API) so that third parties can use the information provided to reach the populations of interest. Making data available through APIs should be a first step; efforts that do so should monitor how their data are used by third parties and ways that they can be made more effective.

3. **Pair information with assistance.** Research is clear that data and information are more effective when paired with resources that can help the population of interest navigate the process for engaging with education and/or training opportunities or job search

assistance. These resources for assistance can take many different forms, including live and virtual help, but should work to reduce the time and effort involved in working through the complex processes involved.

4. **Develop resources that work on multiple platforms.** Data show that technology ownership and internet access vary in ways that have implications for efforts to reach low-income, lower-skilled, unemployed, and underemployed adults. While many in this population may be dependent on smartphones for internet access, others may lack smartphones and broadband access. The data presented in this brief also vary by geography in important ways. For example, in many rural areas, broadband access could be a major issue. Efforts should intentionally identify the target population and its members' access to technology and the internet prior to developing new resources.

5. **Consider intermediaries as a key target audience of new data and information.** There are many government agencies, community-based organizations, and others (including employers) who could be key stakeholders and partners in efforts to help low-income, lower-skilled, unemployed, and underemployed individuals find good education and training opportunities, as well as promising career pathways. Staff working at these entities could be effective partners with data providers in enabling this population of interest to find good opportunities. If this approach is pursued, these potential partners should be brought into the design and development process at early stages to ensure their feedback is reflected in the finished products.

One final recommendation that applies to the field in general is that there must be a concerted effort to keep researching what works and why in this crucial area. Data and information will continue to develop, surrounding us with more and more knowledge. But making sure this growing access to information enables populations that have regularly been left behind in reaping the rewards of "big data" to improve their lives must be a sustained focus.

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