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REVIEW OF *THE COSTS OF ONLINE LEARNING*

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Summary of Review

Schools and school systems throughout the nation are increasingly experimenting with using various instructional technologies to improve productivity and decrease costs, but evidence on both the effectiveness and the costs of education technology is limited. A recent report published by the Thomas B. Fordham Institute sets out to describe "the size and range of the critical cost drivers for online schools in comparison to traditional brick-and-mortar schools" (p. 2). The study divides online learning into two broad categories—virtual schools and blended-learning schools—and, based on data from 50 experts, reports that "the average overall per-pupil costs of both models are significantly lower than the $10,000 national average for traditional brick-and-mortar schools" (p. 1). These findings, however, are undermined by a general lack of clarity about the models being studied and problematic data and methods. While the report addresses an important topic, the utility of its cost estimates are limited. Of more value are the qualitative findings about how various cost drivers affect the overall costs of online learning. The study would be more useful if it provided a rigorous analysis of a set of well-defined promising models of online learning as the basis for its cost estimates.

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Review of *The Costs of Online Learning*

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I. Introduction

The past two decades have witnessed a major shift in the role information technology plays in how Americans work, play, learn, interact, and conduct their daily lives. Schools and school systems throughout the nation are increasingly experimenting with various instructional technologies as a way to improve productivity and decrease costs. The number of instructional computers in public schools has increased from 5.6 million in 1995 to over 12.6 million in 2005, and the percent of classrooms with internet access increased from eight to 94 percent over the same period.[1] Given this rapid growth, evidence is needed to evaluate both the effectiveness and the costs of education technology initiatives.

A recent report published by the Thomas B. Fordham Foundation took on the important task of estimating the costs of these innovations. The goal of *The Costs of Online Learning* is to describe "the size and range of the critical cost drivers for online schools in comparison to traditional brick-and-mortar schools" (p. 2).[2]

II. Findings and Conclusions of the Report

The report divides online learning into two broad categories—virtual schools and blended schools. In virtual schools, all instruction takes place online. The report's definition of blended schools is less clear: students in these settings "attend brick-and-mortar schools where they alternate between online and in-person instruction" (p. 3). Based on information gathered from public documents and conversations with about 50 "experts and vendors in the field" (p. 5), the study estimates that the per-pupil costs of both virtual and blended models of online learning are lower than the $10,000 average per-pupil costs of traditional brick-and-mortar schools in the U.S. In virtual schools, average per-pupil costs amount to $6,400 per student, with a reported range of $5,100 to $7,700.[3] In blended schools, average per-pupil costs are reported to be $8,900, with a range of $7,600 to $10,200. It is important to note that the virtual-school cost estimate is based on full-time high school students, while the blended-school estimate is based on middle school students. In both cases, cost estimates are based on schools with enrollments of about 500 students (p. 4).

The report attempts to account for the costs of the three approaches (traditional, virtual, and blended) by five cost categories: (1) teachers and administrators; (2) content acquisition, including the purchasing, development, and integration of instructional materials; (3) technology and infrastructure; (4) school operations; and (5) student support, including guidance counselors and special education teachers. The per-pupil costs of the blended school model look very similar to those of traditional schools, with modest decreases in expenditures on staff and school operations and an increase in expenditures on technology.

In contrast, the virtual school model reduces the average per-pupil costs of traditional schools by more than one-third. This overall expenditure reduction is realized by cutting the largest expenditure categories—staff and school operations—in half. The virtual

Aside from one think-tank citation, the report does not utilize the growing body of research on education technology to help sort out its terms and clarify the purposes of the study.

school model more than doubles the expenditures on technology and content, but since the dollar amounts of these categories are small ($1,200 and $800, respectively) compared to the other personnel-driven cost categories, the net cost savings of this model is large. The report cautions that this cost analysis provides no "guarantee of quality, given the insufficient data on student outcomes associated with the range of models" (p. 4).

The report concludes by recognizing online learning as "an immature, still developing sector" (p. 11), and considers several factors that affect the cost of these approaches. Attention is given to the considerable start-up costs associated with online programs and options for how school systems might be able to cover those costs. Further, the report discusses the future of labor costs that may result from changes in the nature of teachers' work and the professional development and training they may need in order to do their work in a more technologically driven context. The report also explores the future of instructional content acquisition and, specifically, how technology may encourage a system that is less dependent on a small number of textbook publishers than is the case today. The premise is that the proliferation of electronic instructional materials will allow smaller companies to compete, and that current accountability systems provide a structure for schools to make more independent and cost-effective decisions about content and materials.

III. The Report's Rationale for Its Findings and Conclusions

The findings presented in this report are organized around four general lines of discussion. First, the report recognizes that the important issue is productivity. In the words of the authors, "The key question that will eventually have to be addressed is: Can online learning be better and less expensive?" (p.1). To answer questions about productivity, one

must analyze both inputs (costs) and outcomes (learning). Since this report only addresses the costs of online learning, it does not offer sufficient evidence to draw conclusions about productivity.

Second, the report identifies two broad models of online learning—virtual and blended—and then compares the costs of those models with an estimate of average per-pupil expenditures nationally. The national cost estimate is drawn from the National Center for Education Statistics and includes all public schools serving all students across the nation.[4] The basis for the cost estimates for the online learning models is not clear. While the report describes an example of each model, it does not identify the actual models, data sources, or instruments used for the analysis.

Third, the report identifies five cost drivers of online learning—labor, content acquisition, technology and infrastructure, school operations, and student support—and discusses how they affect the costs of the two forms of online programs. The report estimates the range of costs within each of these cost categories and notes some of the trade-offs that exist across categories. For instance, if content is developed in-house instead of being purchased from outside providers, costs for school labor can be expected go up.

Finally, the report discusses issues related to the start-up, size, scale, and future direction of online learning, and argues that new innovations, models, and providers will drive the future costs of online learning. The paper concludes that while technology has the potential both to improve student outcomes and to lower costs, questions about the productivity of online learning remain unresolved. The report concludes,

> We must shift the focus to productivity—how to improve and maximize student achievement relative to the money invested. This paper has presented findings on the current costs of both virtual and blended models—and shows that there is no definitive cost for either. The paper has not, however, systematically tackled the question of productivity—a focus which is accompanied by multiple challenges (p. 12).

IV. The Report's Use of Research Literature

One of the major weaknesses of this report is its lack of attention to the research base on the use of technology in education. From the beginning of the report, terms like online learning, online instruction, and technology-rich education are used interchangeably. The problem is that instruction is *not* the same as learning, and all technology-rich education is *not* online. This lack of clarity is distracting and blurs the focus of the report. Aside from one think-tank citation,[5] the report does not utilize the growing body of research on education technology to help sort out these terms and clarify the purposes of the study. Likewise, the report does not cite research literature to support its claims about trends in the use of technology in schools, explanations for those trends, or forecasts for the future of education technology.

While the evidence base on the application of technology to education is far from robust or definitive, it is surprising that this report cites *no* empirical evidence on the costs or effectiveness of the various approaches to online learning. The authors clearly recognize that research on the costs of online learning exists, but they do not engage it. Nor do they acknowledge studies of the effectiveness of online learning that might help identify promising (and not so promising) models or design features for the cost analysis. As noted in the next section, the analysis would be much stronger and much more useful if it focused on a set of well-defined promising models of online learning instead of relying on a vague set of undisclosed projects as the basis for the cost estimates.

Finally, the report pays no attention to the methodological literature on estimating the costs of education interventions.[6] That literature might have helped to overcome some of the methodological weaknesses described below.

V. Review of the Report's Methods

While more information on the costs of online learning certainly would be helpful in guiding policy and practice, the cost estimates presented in this report are based on problematic and often unclear methods. Specific concerns include the data sources, the models studied, the shortcomings in the cost analysis, and the grounds for cost comparisons.

The Data Sources

The data sources used to support the study are unclear and appear to be inappropriate to accomplish the stated goal of "attempt[ing] to estimate average costs—and a range of costs—for online learning as currently practiced in the U.S." (p. 1). Its cost estimates are based on interviews with only about "fifty entrepreneurs, policy experts, and school leaders" (p. 2). Given the proliferation of education technology and online learning, this modest selection of 50 individuals seems insufficient for estimating the costs of online learning in the U.S. Further, no additional information is given on the interviews or the respondents. How were these 50 people selected? Were they associated with "promising" online programs? Were they just a convenient sample? What were they asked in the interviews? A more rigorous research design aimed at understanding the costs of online instruction in current practice might have surveyed all districts in a state to understand the dominant approaches and related costs. Without more information on the interviews and the programs represented, it is impossible to judge the accuracy or representativeness of the cost estimates presented in the report.

The Models of Online Learning

The focus of the cost analysis is on two broadly defined models of online learning—virtual schools and blended schools—but the report does not clearly explain why these are the most appropriate categories for a cost analysis of online learning. The report cites one

study that profiles 48 approaches to online learning, but it doesn't describe those approaches or demonstrate how they fit into the two broad models used in this report.[7] Further, the two models used in the report are ill-defined. The major issue here is that the report is not clear about what exactly is being costed out or how the cost estimates are generated. The analytic approach is simply too vague and, as a result, the reported cost estimates are of little use either for profiling current investments or for providing generalizable estimates of various models to guide decisions about investing in technology-based education.

This report would be much stronger if its analysis were based on a more rigorous conceptual foundation that profiled the various forms of technology-based instruction—either on a continuum or as a typology—and identified several promising models for the

The report's lack of clarity surrounding the models being studied and its methodological shortcomings limit its utility.

cost analysis. A research design geared toward costing out a set of promising approaches, based on either empirical evidence or design principles derived from conceptual studies, would begin to account for the productivity issues raised, but not resolved, throughout the report. However, this type of study design would require the authors to identify a more evidence-based set of models as the basis of the cost analysis.

The Cost Analysis

The estimates presented in this report are undermined by a number of methodological problems embedded in the cost analysis. First, since the report does not provide a clear description of the methods used to generate the cost estimates, it is difficult to interpret either the average estimates or the range of costs presented. The report says that "outlier models at both the high and low ends do not necessarily fall within these bands" (p. 5), but a group of 50 respondents is insufficient to generate a dependable range of estimates or to allow for conclusions about averages or outliers.

Second, the per-pupil cost estimates are based on school-level models. While the authors recognize that the size of the school will impact the per-pupil costs, their cost estimates do not account for economies of scale that may exist when many schools in a single district or state use similar online learning models.

Third, the report recognizes the considerable up-front costs associated with online learning models. However, more attention should be paid to the long-term capital costs of these programs. The reliance of these programs on equipment requires a more sophisticated analysis of long-term costs than this study provides.

Fourth, the analysis is based on five cost categories, but some important cost considerations seem to be absent. Where do issues of state approval and compliance fit?

What about costs related to student assessment and school accountability? How does one capture the facilities costs associated with non-school remote instruction? To what extent are costs passed on to families in terms of space and equipment?

The Cost Comparisons

The report compares the costs of the two models of online schools with those of "traditional brick-and-mortar schools" (p. 1), using an estimate pulled from the National Center for Education Statistics' *Digest of Education Statistics*. This is a reasonable source for data about public schools, but comparing this estimate to the estimated costs of online learning in this study is problematic for several reasons. First, the national estimate includes schools already using various forms of educational technology, which may bias the figure upwards. Second, the *Digest's* average per-pupil expenditure figure includes special education students, English language learners, and other "high cost" student groups who may not be well served by the online learning models included in this analysis. This difference in student populations served would again bias the national cost figure upwards. Third, the national figure is an average of all schools in the nation while the online cost estimates are based on a small group of middle and high schools that may have very unique characteristics beyond the online programs. On all of these grounds, the comparisons presented in this study are problematic.

VI. Review of the Validity of the Findings and Conclusions

The conceptual and methodological limitations discussed above limit the validity of the cost estimates presented in this paper. It would be impossible to replicate this study given the lack of information provided on the data sources and methods. The report offers an interesting discussion of what factors may affect the costs in the various categories, but falls short in not providing a rigorous analysis of these costs.

VII. Usefulness of the Report for Guidance of Policy and Practice

Given the growing use of technology in K-12 education as a way to improve student outcomes and decrease costs, policymakers need evidence on how best to invest limited resources. While evidence is needed on both costs and outcomes, this report focuses only on the cost side. It attempts to contribute to the knowledge base by estimating "the size and range of the critical cost drivers for online schools in comparison to traditional brick-and-mortar schools, in order to understand how cost categories have the potential to change when technology is used in the classroom" (p. 2). However, the report's lack of clarity surrounding the models being studied and methodological shortcomings limit its utility. The presentation of cost estimates in tidy tables masks the imprecision that results from the research design. This presentation of the findings is problematic since the study provides no direction about what sorts of technology-based interventions might actually be associated with the price tags presented. The potential consequence is that the estimates may mislead policymakers, or be misused to advance particular policy agendas.

The lack of attention given to "promising" models in favor of a focus on current practice also limits the utility of the study. The report estimates the costs of "online learning as currently practiced in the U.S."—but relies solely on interviews with 50 individuals. One would expect to see a large and representative sample to support such a study. One would also expect to see a clear description of a rigorous, empirical analysis used to generate the cost estimates. Further, looking only at current practice limits the potential of the study to inform policy; a more useful approach would be to focus on well-defined promising models of online learning.

The report does acknowledge that its estimates are far from definitive and that "the choices, trade-offs, quality considerations, and timelines matter enormously" (p. 1). The discussion of these issues, though not exhaustive, is the real contribution of this study. By unpacking how various factors may affect the overall costs of different approaches to online learning, this more qualitative analysis is both provocative and potentially useful to policymakers.

Notes and References

1 U.S. Department of Education, National Center for Education Statistics. (2011). *Digest of Education Statistics, 2010*. Washington, DC: National Center for Education Statistics. Retrieved February 4, 2012, from http://nces.ed.gov/programs/digest/d10/tables/dt10_108.asp?referrer=list.

2 Battaglino, T.B., Haldeman, M. & Laurans, E. (2012). The Costs of Online Learning. Washington DC: Thomas B. Fordham Institute. Retrieved February 4, 2012, from http://www.edexcellence.net/publications/the-costs-of-online-learning.html.

3 The authors report variation ranges of ±20 percent for the virtual model and ±15 percent for the blended model.

4 U.S. Department of Education, National Center for Education Statistics (2011). *Digest of Education Statistics, 2010*. Washington, DC: National Center for Education Statistics. Retrieved February 4, 2012, from http://nces.ed.gov/pubs2011/2011015.pdf.

5 Horn, M.B. & Staker, H. (2011). *The Rise of K-12 Blended Learning* .Mountain View, CA: Innosight Institute. Retrieved February 4, 2012, from http://www.innosightinstitute.org/media-room/publications/education-publications/the-rise-of-k-12-blended-learning/.

6 See, for examples:

Levin, Henry M. (1983). *Cost-Effectiveness: A Primer*. London: SAGE

and Levin, H. & McEwan, P. (2001). *Cost-effectiveness analysis* (2nd ed.). Thousand Oaks, CA: SAGE Publications.

7 Horn, M.B. & Staker, H. (2011). *The Rise of K-12 Blended Learning* .Mountain View, CA: Innosight Institute. Retrieved February 4, 2012, from http://www.innosightinstitute.org/media-room/publications/education-publications/the-rise-of-k-12-blended-learning/.

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