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Review of *Teachers in the Age of Digital Instruction*

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Summary of Review

The Fordham Institute's *Teachers in the Age of Digital Instruction* is an advocacy document outlining a vision for how technology might transform the teaching profession. The report's rationale is based on claims that the current education system lacks the capacity to support the revolutionary changes needed to unleash the technological innovations of online instruction that will yield increased effectiveness and efficiency. The report explains that effective teachers are central to the demands of online instruction and will be even more necessary in the digital age than in the current system. It asserts that the elements that constitute effective teaching can be broken down into discrete skills and then packaged and distributed to a wider group of learners via digital media. Harnessing the talents of effective teachers will be critical in both meeting the needs of students and in making teaching a "true profession" (p. 2) through increased specialization and tiered salary structures. While the report addresses an important topic, it provides little or no empirical research evidence to support the claim that digital age technologies will improve the education system. Without sufficient or adequate use of evidence to support its claims, the report amounts to only a vision of what changes might be necessary as the digital revolution comes of age in public education.

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Review of *Teachers in the Age of Digital Instruction*

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I. Introduction

Online instruction has grown substantially over the last several decades, with nearly one in every 50 students in the United States receiving online instruction, either to supplement traditional classroom teaching or full time.[1] The growth of online instruction is fueled by a variety of sources, including federal policymakers who have called on educators to prepare students with 21st-century skills,[2] state-led initiatives to expand online or virtual schooling such as Florida Virtual School,[3] and non-profit and for-profit management organizations running cyber charter schools in 27 states serving nearly 150,000 students.[4] The rationales offered for promoting online instruction vary widely and include claims of increased efficiency compared with traditional schools (both in cost and effectiveness), increased personal, customized attention to students' learning needs, and expansion of school choices for families.

This review focuses on the Fordham Institute publication *Teachers in the Age of Digital Instruction,*[5] an advocacy document that outlines a vision for how technology might transform the teaching profession. The validity of the report's claims are limited given that it relies heavily on other advocacy reports written by the same authors, reports that are also limited in their use of supporting research evidence. This review considers the merits and potential usefulness of the report and also focuses on the weaknesses and assumptions of the report's proposals for recruiting, supporting and retaining effective teachers.

The report is premised on a vision that teacher quality will matter more in an era of increased technology than it does now. Specifically, in the digital age the teaching profession will be transformed into a hierarchy, with effective teachers in higher demand and required to reach a larger number of students through online instructional models. Effective teachers will be rewarded with increased pay for both their merit and the number of students they reach, and these financial rewards will both attract and retain effective teachers. Average teachers will benefit from technology by having to engage in fewer "complex tasks" (p. 8), focusing instead on delivering personalized instruction, tutoring small groups of students and providing other supplemental services. Ineffective teachers will either leave the profession, be limited to monitoring online learning labs, or be replaced by better-qualified entrants.

II. Findings and Conclusions of the Report

According to the report, the new hierarchy of teaching in the digital age will be supported by wider changes in the teaching profession. Technology will transform teacher training and professional development and will require the adoption of electronic media. Teacher-preparation programs will need to attract "digital natives" (p. 7) who have grown up using digital tools. New competencies linked to effective teaching "performances" (p. 2) will demand "media-genic super-instructors" (p. 5) who can prepare live and recorded lessons. Teachers will also need to be competent in remote tutoring and using electronic

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data systems that will allow for increased personalized instruction. The report explains that remote instruction increases flexibility in where teachers choose to live and where they work, and facilitates the ability of teachers to increase individualized instruction. Teachers will also be expected to learn how to create or design electronic software applications that convert their pedagogical knowledge into digital tools and lessons that deliver instruction "without direct teacher interaction" (p. 5).

As new generations of teachers are trained with skills needed in the digital age, new evaluation systems will also need to be implemented. Evaluation systems will need to shift from measuring the effects of a single teacher on a student's learning curve to measuring how multiple teachers and paraprofessionals have contributed to a student's development. The "unbundling" (p. 8) of a teacher's role will make evaluation more complex, but will also allow for greater differentiation and evaluation of the specific roles associated with the proposed teacher hierarchy.

The report also calls for broad changes in both public policies and the management systems that govern schools, and a technology infrastructure to support learning in the digital age. The authors acknowledge that our nation's schools "are not there yet" (p. 6) in their capacity to support wide-scale digital learning. Nationwide, access to low-cost broadband internet for all students and teachers is lacking. Schools also lack the platforms necessary to use the digital learning tools now being rapidly developed. Also, the professional development necessary to train teachers to deliver digital instruction is still being developed.

Integrating changing technologies into schools will require changes in how schools are funded and how teacher employment contracts are governed. The report suggests that state school funding policies and collective bargain agreements governing teacher salaries will need to be more flexible in order to enable the allocation of funds to new technology and to accommodate greater differentiation of teachers' roles. This flexibility is vital, according to the report, for increasing the salaries of "star" teachers (p. 5) who will be expected to reach more students and for creating new salary schedules and roles for staff

who will monitor learning labs, conduct remote tutoring and perform other duties that may not require a certified instructor. The report claims that this new flexibility will allow schools to recruit higher-caliber teachers and retain them with higher pay and better career opportunities. Lastly, union contracts and labor agreements will need to adjust to a differentiated and geographically dispersed workforce that will also be smaller as the efficiencies of new technologies are integrated. Unions will need to compete for "free agent" (p. 10) educators and meet the demands of a changing workforce. As schools and teachers shift from upholding the "child-care function" (p. 3) associated with the brick-and-mortar schooling of today, the workforce of the future will evolve into an "opportunity culture" (p. 3) where fewer teachers will be necessary and professional and monetary rewards will be linked to a teacher's effectiveness in their specialization.

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

The report's rationale is based on claims that the current education system lacks the capacity to support the revolutionary changes needed to unleash the technological innovations of online instruction that will yield increased effectiveness and efficiency. The report explains that effective teachers are central to the demands of online instruction and will be even more necessary in the digital age than in the current system. It asserts that the elements that constitute effective teaching can be broken down into discrete skills and then packaged and distributed to a wider group of learners via digital media. Harnessing the talents of effective teachers will be critical in both meeting the needs of students and in making teaching a "true profession" (p. 2) through increased specialization and tiered salary structures.

The report provides little or no empirical research evidence to support the claim that digital-age technologies will improve the education system. Without sufficient or adequate use of evidence to support its claims, the report amounts to only a vision of what changes might be necessary as the digital revolution comes of age in public education.

IV. The Report's Use of Research Literature

The report's use of research evidence is tenuous and problematic on several grounds.

First, the report bases much of its vision on a series of reports prepared by the authors and others, which like this report amount to advocacy by those who are actively engaged in promoting online learning.[6] While some of the cited reports are based on case studies of how online learning is emerging, none of the reports provide empirical evidence to substantiate the claimed effectiveness of online learning.

Second, the report's claims of effectiveness of online instruction are inconsistent with the findings of the few research studies it cites. For example, in their discussion of the nascent research on online learning, the authors erroneously use the U.S. Department of Education meta-analysis,[7] oft-cited by advocates of online learning, to support their claim that the online instructional model has a "small edge over average instruction for now" (p. 6). The

meta-analysis of online learning research used a high threshold for determining which studies were rigorous enough to be included. While some modest positive effects of online learning were found in the included studies, the authors strongly caution that the measured advantages may be more a result of the types of treatment conditions in online models (such as the amount of time the learner spent on a task in online learning) than of the instructional delivery model itself. More importantly, the small statistically significant positive effects of online instruction are limited to studies that measured its effects for adult learners. Specifically, only 7 of the 50 studies included in the meta-analysis examined a K-12 learning environment, and the weighted mean of the modest positive effects of these seven studies were not statistically significant. Lastly, the authors of the meta-analysis warn that the number of rigorous studies on K-12 online learning is still too small to warrant confidence about its effects. These important oversights call into question the Fordham report's main thesis and raise questions about the motivation for the report.

Third, the report omits important research that presents contrasting explanations for many of its claims. The authors repeatedly assert that increased teacher pay will both attract and retain effective teachers. They fail to substantiate these claims with research evidence, however. Recent research on financial incentives aimed at increasing teacher effectiveness and retention has shown few positive effects. For example, a signing-bonus program in Massachusetts that promised new teachers both an extra $20,000 over their first three years in the profession and professional development training tailored to the challenges of teaching in high-needs schools was found ineffective in retaining new teachers.[8] A prominent study conducted in Nashville, which employed an experimental design with randomization of treatment and control groups of teachers, examined a performance-based bonus program that provided middle school math teachers with up to $15,000 in annual bonuses for increasing student performance on standardized tests.[9] This well-designed study found no statistically significant treatment effect on student achievement; nor were the monetary bonuses a reliable predictor of teacher retention. Other studies have discovered that financial incentives are insufficient to retain teachers in schools with poor teaching conditions (including low-achieving students) or a lack of support for the practice of teaching.[10]

Fourth, emphasis on the importance of effective teachers in a digital age must take into account research that considers the contextual factors associated with effective teaching, including the wider school organizational environment that supports teachers.[11] Effective teaching is fostered by strong leadership, peers, professional development, books, materials and a myriad of other resources that constitute the capacity and school culture necessary to support teachers.[12] Individual attributes, such as subject-specific certification or advanced degrees, that might matter in one context (grade level, subject, school type) may not matter in another.[13] For example, while variables of individual teacher quality (e.g. certification, education level) are important, unobserved school, teacher, and classroom variables, which are typically not measured in studies of teacher quality (e.g. teacher motivation and behavior or class size) are vitally important.[14] In addition, recent research in New York City has reported that strong teacher mentors and induction programs positively influence the performance and retention of new teachers.[15]

Last, the report does not sufficiently take into account the wider implementation and accountability challenges associated with online learning reforms. Recent research on cyber charter schools has outlined the important issues that policymakers need to address in developing new regulatory frameworks for online learning. Specifically, factors such as the differential funding associated with online learning models that have lower costs than traditional schools (e.g. facilities, transportation, teachers salary and benefits), new accountability measures that could both account for and define adequate instructional time (e.g., maintenance of student records and lesson transcripts or determining how instructional time is used, logged, and evaluated), and reporting of how per-pupil payments are linked to services provided (e.g., technology, learning materials, paraprofessional services, and third-party curriculum and management service providers).[16] This research could assist policymakers and practitioners in determining the viability of online schooling models in the context of increased state and federal accountability demands.

In light of the findings from the research literature presented, it is clear that the Fordham authors—like other proponents of online instruction—have yet to identify the capacity necessary to develop, support, and sustain effective teaching in a virtual environment.

VI. Review of the Validity of the Findings and Conclusions

The report's conclusions must be considered in the context of the limitations of the research evidence it uses to justify the claims it advances. The reader is left to reconcile many of the inconsistencies and contradictions that the authors outline in their utopian vision of schooling led by electronic learning.

For example, the notion that effective teachers will wholeheartedly embrace digital tools and be motivated to adapt the processes of teaching in a one-dimensional virtual environment must be further explored. In addition, the preferences of parents and students must also be considered. Effective schooling is about more than simply the delivery of instruction, but includes the social and cooperative elements of interacting with student peers in person and in real-time, which in part activate effective teaching.[17] The extent to which virtual environments will be able to replicate these important virtues of effective classroom schooling is not known. Nor is the extent to which parents and students will favor virtual learning environments over traditional schooling known.

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

As this paper is a vision piece, it may serve as a model for further exploration, but it lacks the empirical base necessary to serve as the basis for laying out even a preliminary foundation to guide policy and practice. Vital details of the potential implications of widespread adoption of digital technologies on teaching and learning practices or accountability structures, as well as regarding the resources necessary to implement the reform, are not developed. Policymakers should seek more balanced and empirically robust assessments that will allow them to make informed decisions about how to proceed with school reform polices that advance online instruction.

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