

'Math for America' Isn't

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Abstract

Aspects of the Math for America organization's actions, aims and affiliations are analyzed for their effects on urban schools and society at large. These aspects are argued as evidence to consider MfA as an agent working against democratic practice and in favor of furthering profit and its resultant inequitable resource distribution. The organization also serves to succinctly represent the primary reason why society values mathematics and sciences above other knowledges. Besides MfA, similar examples of activities related to math and science education are highlighted, such as scholarships offered only to math and science teachers, and a short-lived Traders to Teachers program.

Keywords: math education, democracy and education, teacher labor, and curriculum studies.

Math for America (MfA) is a not-for-profit organization that in 2004 began recruiting adults with mathematical knowledge to become teachers in the New York metropolitan area. Candidates with a high level of math knowledge and an interest but no experience in teaching were encouraged to apply. Initially, the fellowship program provided accepted teacher candidates with full tuition scholarships to nearby, private teacher education programs and a stipend of money above their salaries for the first four years of their teaching in public New York City schools. Today, *MfA* awards such monetary packages with two programs: the fellows program which remains roughly the same, and the master teachers program, which invites practicing teachers to apply. Master teachers do not receive tuition scholarships, but do receive salary stipends. *MfA* reports that both fellows and master teachers receive over \$60,000 in stipends over four years ("Math for America Announces 2012 Corps," 2012) The program now operates in New York City, Washington, DC, Los Angeles, San Diego, the state of Utah, Berkely, CA, and Boston. In 2012, it announced 150 new masters and fellows across the US.

In 2012, *MfA* presented its mission as improving "mathematics and science education in US public secondary schools by building a corps of outstanding STEM teachers and leaders" ("Mission and Vision," 2012). Their mission is

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now a bit more honest: "MfA makes teaching a viable, rewarding, and respected career choice for the best minds in science and mathematics" ("Vision, Mission and Values," 2014). The second statement more directly signifies their actions in paying math and science teachers more than their peers teaching the other content areas. They first argue that to learn math and science, students need teachers who know math and science. Continuing their logic, they argue that adults with this knowledge have more lucrative job opportunities than public school teaching. Accordingly, the adults with knowledge of math and science do not choose to teach. Their solution is to increase the pay of math teachers. They write:

Money is important: Prestige is the goal. Teachers play a key role in all high quality education, but especially in math and science, where teachers convey not only knowledge but attitudes as well. If we want to attract the best people and keep them in the classroom, we also have to make the job of teaching more attractive. One of the goals in awarding stipends is to add prestige to the profession. ("Mission and Vision," 2012).

Therefore, *MfA* has grown to impact urban schools across the US primarily by paying math, and now science, teachers money above their salaries. Over time, the organization and its programs have been lauded by President Obama and have served as models for federal policies regarding math teacher recruitment. For example, the Obama-Biden campaign alluded to the *MfA* strategy in their stance on education ("Education: The Obama-Biden Plan," 2008). The Robert Noyce Teacher Scholarship, a National Science Foundation (NSF) grant program, roughly does the same thing as *MfA* by awarding tuition scholarships and stipends to future math and science teachers. ("Robert Noyce Teacher Scholarship Program," 2013). This paper considers this influential organization: its actions, aims, and affiliations. I have been following the organization for some time now, examining their declarations since at least 2010. In the following, I present selections from among these examinations and use such to argue that *MfA* is deeply suspect as an agent against democratic practice in schools and society and in furthering profit and its resultant inequitable resource distribution. In addition, I contend the organization succinctly represents the primary reason why society values mathematics above other knowledges.

On the surface, *MfA* does good work by fostering people with strong

mathematical backgrounds to become math teachers in urban public schools. However, their approach to this end gives me pause and provides the initial critique I present here. They attract and/or retain such people primarily by providing additional monetary compensation via two programs: Fellowship and Master Teachers. The Fellowship program awards full scholarships for inexperienced teachers to attend a Master's of Arts in Teaching program at among well respected teacher education programs in the country (e.g. New York City fellows attend either NYU, Teachers College or Bard College).ⁱ Upon graduation, fellows are then required to teach in a public school in their designated metropolitan area (New York City, San Diego, Los Angeles or the District of Columbia) for four years. During the five year program, fellows receive roughly \$100 thousand in the form of cash, as well as ongoing mentoring and support. The Master Teachers program is for practicing teachers in one of the four metropolitan areas who already hold a teaching certificate. Master Teachers are awarded \$70 thousand in cash and ongoing mentoring and support over four years.

In short, *MfA* compensates teachers with more cash for their work. Many will view this as justice long overdue. I do not intend to debate whether typical salaries for teachers are appropriate; my concern rests with the fact that the compensation programs in *MfA* are limited only to middle and high school *math* teachers, and not all public school teachers. This practice of limitation to rewards consciously rejects the most typical salary determination for public school teachers, namely a collective bargaining agreement in which all teachers within a district are compensated only according to the number of years of experience and educational credits obtained. This typical salary determination assumes equality in talent and labor regardless of content or grade level taught.

Indeed, justifying that math teachers should be paid more presents a hard sell to non-math public school teachers and ignores an historical struggle on just that point. For one, the situation is uncomfortably similar to the fight for equal pay that primary school (mostly female) teachers had to win, successful only by arguing against the secondary school teachers (mostly male) who self proclaimed intellectual superiority (Rousmaniere, 1997). One historical figure might serve to symbolize these struggles for equality amongst teachers: that of Margaret Haley, the turn of the century leader of the Chicago Teachers' Federation. Haley radicalized teachers' organizations in her demands for corporate taxation for schooling, for respecting teacher professionalism, and

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most important here, for her advocacy as schools for sites of both democratic practice and education for stronger democracy (Tyack, 1974).

This latter point of Haley's, particularly of schools as sites for democratic practice, proves relevant to *MfA*'s actions. I take democratic practice to mean a situation where the people rule themselves via group decision making and mutual respect and aid for and amongst all group members. Differentiating pay between disciplines and grade levels works against democratic practice first because it was not decided on by the group of teachers who work together in a school. We would be hard pressed to find a collection of teachers across disciplines that would agree to such a pay system. In this hypothetical situation, the math teachers who present their arguments for higher pay would find it difficult to do so without disrespecting the labor and talent other teachers offer in their practice. The *MfA* practices work outside such agreements amongst teachers and undemocratically announce a hierarchical pay scale amongst teachers of various content areas and grade levels. This hierarchy warrants disrespect directed from math teachers to non-math teachers by claiming they are worth more; vice versa, the hierarchy warrants disrespect from non-math teachers to math teachers by the arrogance it presents.

Other aspects to the democratic practice of schoolsⁱⁱ will crumble because solidarity is now compromised. Chomsky reminds us that “democratic control of one's productive life is at the core of ... any significant democratic practice” (1976, p. 134). He argues that democratic practice should include the economic. I expect math teachers who are paid more by outside sources will be less likely to participate in the efforts of collective bargaining. Perhaps the most disappointing outcome in my learning on *MfA* was the fact that Randi Weingarten, current President of the American Federation of Teachers, is on *MfA*'s member board. That this union leader would embrace a process that undermines the democratic practice of teachers indicates the magnitude of radicalism and Haley's influence that have escaped teachers' unions today. I will return to a more complete picture of *MfA*'s affiliations after considering its aims, to which I will now turn.

I have argued that *MfA* actions announce a hierarchy of knowledge within schools, and the aims of the organization only partially admit to this fact as it applies outside of schools and in society at large. In a video contained on their website, *MfA* founder Jim Simons says, “Why is it important that kids

learn math? It's kind of obvious that the whole future of the economy is more and more dependent on quantitative methods.” The organization states that math is important, but nowhere in the literature or information on *MfA* did I find a suggestion that other disciplines are *less* important for the future of the economy (or for any other purpose for education). So, only on investigation of the actions to pay teachers do we clearly see the hierarchy of knowledge, and true justification for this hierarchy in society will only take place when we look at the affiliations later.

For now, the aims can at least tell us how they skirt their full admission to superiority of mathematics by offering an entirely different reason for paying math teachers more money. From *MfA*'s website: “It’s become abundantly clear the basic rules of supply and demand need to be applied to our education system.” This argument has been presented by several people over the years, and is nicely expressed here by Alan Greenspan (2007):

“Different pay scales for high school teachers in different disciplines may go against the ethos of teaching. Perhaps money should not be an incentive. But it is. . . . It is becoming increasingly clear that a flat pay scale when demand is far from flat is a form of price fixing that undermines the ability to attract qualified math teachers. Since the financial opportunities for experts in math or science outside of teaching are vast, and for English literature teachers outside of teaching, limited, math teachers are likely to be a cut below the average teaching professional at the same pay grade. Teaching math is likely being left to those who are unable to claim more lucrative jobs. That is far less true of English literature or history teachers” (p. 404).

I suspect the suggestion that public school math teachers are the least talented people with mathematical knowledge annoys those of us who chose the profession over more lucrative careers. Lockhart (2009), for example, presents how his passion for mathematics and his perception of the tragedy that is school mathematics curriculum together provided the impetus to be a high school teacher. I for one wonder just how many people fit this category.

Some interesting quantitative analysis regarding math and science teacher shortages comes close to answering the question. Ingersoll and Perda (2009) present data from the National Center for Education Statistics to indicate that there is indeed a shortage of math teachers. However, they argue that the common policy response to this shortage, namely policies for recruitment of

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new math teachers, will not fix the problem because the number of new teachers entering the profession is not the reason for the shortage. Instead, the number of pre-retirement math teachers who leave the profession causes the math teacher shortage. In other words, the number of retirees is small, the number of early-exits is large, and the sum of these is larger than the sum of new recruits.

Interestingly, Ingersoll and Perda point out that the percentage of math teachers leaving early to pursue other jobs is 27.8, whereas the percentage of non-math or science teachers leaving early to pursue other jobs is 38.7. As well, the percentage of math teachers leaving early who report dissatisfaction with their salary (59.9) is roughly equal (60) to non-math or science teachers. These data reject the idea that current math teachers are disproportionately leaving for better paying jobs, leading to at least two possibilities. On the one hand, Greenspan and Simons are wrong: talented math teachers are leaving for other reasons, perhaps from the lack of autonomy in math curriculum, as Lockhart describes. But on the other hand, Greenspan and Simon can fire back with the following explanation of the data: "Well, of course these people aren't leaving for better paying jobs, because they are not qualified the better paying jobs. They don't know math, remember? This is why they chose teaching to begin with." Clearly, empirical work is required to support or refute this claim, but accepting that both are true for the time being, I will turn my attention to the cynical view that the majority of math enthusiasts choose jobs for money.

This reality could mean that students of math and related majors expect to earn a lot of money, and indeed this is probably not far off the mark for at least some if not a majority of mathematical talent. Many mathematics programs attract degree candidates for precisely the earning potential a major will have. For example, the University of Georgia's math department website contains the article "Why Major in Mathematics?" (2010). The first reason, because it looks good for getting into medical or law school, the second because of potential salary. College departments who recruit based on salary potential is but one piece of evidence for a discourse that math and related majors have more valuable knowledge than other disciplines, which again points to a hierarchy of knowledge that *MfA* confirmed in schools with its actions. Society (at least through college math departments) recruits people to embrace mathematical knowledge for its earning potential. So, it might make sense that math majors generally choose the higher paying career

anyways. And so the actions of *MfA* are justified with an aim to use the laws of supply and demand to recruit the best math teachers; this makes perfect sense. Alas we begin to witness that the supremacy of mathematical knowledge exists in society, not just in schools via *MfA* actions.

The answer to why math is on top in the values hierarchy of knowledge may be of no surprise to some but is demonstrated so clearly with a look at *MfA*'s affiliations, namely the investment bankers who provide the money for its programs. Donors listed include the Simons Foundation, Bloomberg L.P., Citadel Investment Group, ING Clarion Capital, the James B. Ax Foundation, the Lehman Brothers Foundation, and participants in the annual "Wall Street Poker Tournament" fundraiser ("Supporters," 2010). Apple (1992, 1995) suggests mathematical knowledge as more valuable for its "technical/administrative" relevance: "In the calculus of values we use to sort out 'important knowledge' from 'less important knowledge,' business and industry, as well as the government, place high value on knowledge that is convertible ultimately into profits and control" (1992, p. 420). Because capitalist society values mathematics more, it comes as no surprise, then, that *MfA*'s founder is Jim Simons, that its primary donor is the Simons Foundation and that he was able to recruit the likes of the above mentioned donors. A review of Simons' biography will serve to represent quite accurately the rationale of Apple's "important knowledge."

First, between 1964 and 1968 Simons worked as a cryptanalyst for the Institute for Defense Analyses (IDA), regarded by many as merely a weapons think tank, including Columbia University students in their famous 1968 protests. To be fair, Simons did send a letter to the NY Times Magazine responding to its own article on the hawkish characteristics of the scientists of IDA: He should not be counted as one of those scientists who works for the IDA *and* supports war (Patterson, 2010). Given his hypocrisy, it seems unclear whether Simons considers mathematics as useful knowledge for weapons, warfare and government control.

However, aspects of Simons biography make formidable his own belief in the use of mathematical knowledge for gaining profits. After the IDA, Simons spent ten years as a mathematics professor at SUNY Stony Brook, but then left with the goal to use his mathematical talent to make money. He is now regarded as an originator of using sophisticated mathematical approaches in

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designing stock market funds. What's more, his Medallion Fund of Renaissance Technologies obliterates all competition as the most successful hedge fund, with returns at roughly 2400 percent over 11 years (Zuckerman 2009). As with most who partake in this competitive game, Simons likes to keep this knowledge tight in order not to spread the wealth, primarily demonstrated by lawsuits to employees who leave (Patterson, 2010) and the fact that Medallion, such a winning hedge fund, is primarily for himself, friends and employees of Renaissance Technologies. Some eyebrows raised with suspicion when the hedge fund offered to the public by Renaissance Technologies, Renaissance Institutional Equities Fund, didn't fair nearly so well, and some considered foul play a possibility (Pulliam and Strasburg, 2009). Nevertheless, Simons is regarded a hero in the Quant Wall Street revolution, the new paradigm of Wall Street gambling that recruited PhDs in math and related fields to program complex betting as opposed to the "old-school 'greed is good'" trading of the 1980s (Patterson, 2010, p. 103). His actions demonstrate that mathematics helped to make him the world's 80th richest person ("The world's billionaires," 2010). These are the reasons why he admits in the *MfA* video that math is important for the economy.

Math enthusiasts of a particular persuasion find this application of mathematics appalling. Offered as an example is Gutstein's (2006) critique of the NCTM standards frame of mathematical literacy:

"From a social justice perspective, there is a significant problem with framing mathematical literacy from the perspective of economic competitiveness. This is fundamentally in opposition to a social justice agenda that instead places the material, social, psychological, spiritual, and emotional needs of human beings, as well as other species and the planet, before capital's needs" (p. 8).

MfA actions, aims and affiliations do not support the ways that mathematics can serve the social justice agenda that Gutstein defines here. Instead, "those with economic, political and cultural power ... employ [mathematics] as they see fit" (Apple, 1995, p. 421). *MfA* indicate an agreement with a view that education produces a resource, namely human capital, for the gaining of profit (e.g. Keeley, 2007 and *Lifelong learning*, 2003). I am sure many enthusiasts, such as Lockhart, can regard this purpose for math in schools as a distortion of mathematics. And as with Gutstein, those math enthusiasts who recognize Marx's critique of capitalism, and are concerned with

representations of the status quo economics as expressed by e.g. Harvey (2005), surely find this distortion to be a tragedy.

Before offering some other examples similar to the activities of *MfA*, I want to return to Apple's notion of the valuation of “administrative/technical” knowledge and how careful exploration reveals again that *MfA* works against democracy. Apple writes: “Though it may be in capital's interest to have an oversupply of trained workers and to have a paid workforce that is more technically competent, powerful economic groups often give only rhetorical support to this because they do not see the cost as justified” (1992, p. 421). But in this case, *MfA* is not giving rhetorical support, they actually give Jim Simons' and other Wall Street money directly to teachers. This counterexample to Apple is explained when we examine more carefully explore *MfA*'s cost-benefit analysis, with the conclusion that along with their cost comes an attack on democratic practice. Tax code allows charitable contributions as exempt, thus allowing Simons et al to funnel their give back to society directly to education. What's more, they bypass giving the funds to education generally, where a democratic process would determine how to use funds, but specifically direct their contributions towards those aspects of education they deem will return significant profits. They ensure that many urban math teachers have chosen the career because it rewards them money, and possibly that encouragement exists for math teachers who espouse the human capital agenda for education.ⁱⁱⁱ Another aspect of their aims, to “provide a national model for math teacher recruitment” indicates again how an influence on federal policy could be yet an even more substantial return on their investment. Indeed, the government is buying their hard sell: the American Recovery and Reinvestment Act has donated \$1.5 million to *MfA* (Bennett, 2009) and *MfA* has been cited for its influence on the National Science Foundation's Robert Noyce Teacher Scholarship Program (“Mission and Vision,” 2010).^{iv} This scholarship doesn't quite provide the compensation that *MfA* does, but is similar in its subsidizing of education only for math and science teachers, and not for other disciplines. *MfA* has thusly aided the ignorance of those engaged in federal policy decisions as to the fact that special education is the worst teacher staffing shortage, as indicated by data included in Ingersoll and Perda (2009).

Another view of the superiority of math relates to notions emerging from Descartes and the Enlightenment. Math is often thought of as the supreme instance of objectivity, of knowing the world objectively and through

deduction. This supreme status has received significant pushback, especially by the work of philosophers of mathematics. In fact, argued are two natures of mathematics: mathematics as an objective, value-free knowledge, and mathematics as a social construction. Philosophy of mathematics literature rests primarily on a debate concerning the relationship between humanity and this particular knowledge (nature). The longstanding and most popular epistemological viewpoint for mathematics conveys the Platonic image of objective knowledge. Sometimes referred to as an Absolutist paradigm (Ernest, 2008), this perspective also maintains that all heretofore produced mathematical knowledge began with explicit assumptions to result in logical deductions. More specific varieties of this broad paradigm include Frege and Russell's logicism, Brouwer's intuitionism and Hilbert's formalism. While all three philosophies of mathematics differ in respects regarding what counts as legitimate processes for the creation of mathematical knowledge, they all hold a commitment to mathematics as a knowledge that is objective and value-free.

Hersh (1994) asserts that Wittgenstein was the first to break from this view by acknowledging that "mathematics is something that people do" (p. 14). This kind of thinking transferred work from the philosophy of science, such as Lakatos, Popper and Kuhn, onto the philosophy of mathematics, ultimately leading to a trajectory towards what Ernest (1998) terms the Fallibilist paradigm:

"Fallibilism views mathematics as the outcome of social processes. Mathematical knowledge is understood to be fallible and eternally open to revision, both in terms of its proofs and its concepts. Consequently this view embraces as legitimate philosophical concerns the practices of mathematicians, its history and applications, the place of mathematics in human culture, including issues of values and education - in short - it fully admits the human face and basis of mathematics. The fallibilist view does not reject the role of structure or proof in mathematics. Rather it rejects the notion that there is a unique, fixed and permanently enduring hierarchical structure." (p. 3)

In this sense, the fundamental debate regarding the nature of mathematics centers on whether mathematics is objective, pre-existing to humans and known because of our discovering it, or primarily a human social activity, constructed by communities of practice. Embracing the alternative side to the debate will naturally lead to freeing mathematics from the burdens of

superiority. Unfortunately, and as *MfA* indicates, mainstream society has not yet come close to even considering the possibility of such a debate.

MfA is not alone in their practice of a privileging the teaching of math, at the expense of other disciplines. Before concluding this analysis of *MfA*, I offer a few of these examples to indicate how *MfA* acts alongside a growing trend. These are Loan Forgiveness and Scholarship Programs, such as the *Stafford Loan Forgiveness Program* and the *Robert Noyce Teacher Scholarships* sponsored by the National Science Foundation, and the short-lived *Traders to Teachers* program that was attempted at Montclair State University.

Similar to Math for America, the Stafford Loan Forgiveness Program compensates math teachers more than other teachers. This program very subtly indicates its alignment to the neoliberal math teaching crisis with the following statement: "The Teacher Loan Forgiveness Program is intended to encourage individuals to enter and continue in the teaching profession. Under this program, individuals who teach full time for five consecutive, complete academic years in certain elementary and secondary schools that serve low-income families and meet other qualifications may be eligible for forgiveness of up to a combined total of \$17,500 in principal and interest on their FFEL and/or Direct Loan program loans." Reading the fine print, however, indicates that a new teacher may be forgiven \$17,500 if she is a math, science or special education teacher. All other teachers are only eligible for \$5000. As with Math for America, the Stafford Loan Forgiveness Program implies a higher valuing of teachers of mathematics and is thus argued to contribute to the neoliberal agenda for education via a push for merit pay.

The *Robert Noyce Teacher Scholarship Program* (2011) seeks to encourage talented science, technology, engineering, and mathematics majors and professionals to become K-12 mathematics and science teachers. The Noyce Scholarship Track provides funds to institutions of higher education to support scholarships, stipends, and academic programs for undergraduate STEM majors and post-baccalaureate students holding STEM degrees who earn a teaching credential and commit to teaching in high-need K-12 school districts. The NSF Teaching Fellowship/Master Teaching Fellowship Track supports STEM professionals who enroll as NSF Teaching Fellows in master's degree programs leading to teacher certification by providing academic courses, professional development, and

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salary supplements while they are fulfilling a four-year teaching commitment in a high need school district. ("Robert Noyce Scholarship Program," 2011).

Named after Robert Noyce, founder of Intel and inventor of the microchip, thereby indicates this program's association of math education to the needs of corporations. As well, it is funded by the Education and Human Resources division of the National Science Foundation (NSF), which supports "the development of a diverse and well-prepared workforce of scientists, technicians, engineers, mathematicians and educators" (About EHR, 2008). The program has awarded over 300 grants to participating universities; several of these grants are over \$1 million.

Another corporate-backed response to a perceived shortage of math teachers up for analysis is New Jersey's Traders to Teachers program. The program "allows individuals displaced from the financial sector or similar industries to pursue certification to teach mathematics. This accelerated program ... is for individuals who have used mathematics in their jobs, and have a sincere desire to become mathematics teachers, whether or not they majored in mathematics in college." The program lasts three months, requiring teacher candidates to spend one day a week in classrooms observing and practice teaching and four days per week "learning mathematics and how to teach it." This program was created and is financed by the New Jersey Department of Labor (via federal grant moneys), but takes place at Montclair State University. Coursework is designed and taught by professors in the College of Education and Human Services and the College of Science and Mathematics.

Proving that Traders to Teachers aligns with the neoliberal crisis in math education requires further explication than the previous two programs. In the program description, there are no statements indicating that Traders to Teachers fulfills the perceived shortage of math teachers. Instead, the language seems to indicate that its purpose is for helping displaced workers find employment. However, the assumption that these displaced workers will be able to find jobs quickly implies a belief that the supply of math teachers does not meet the demand. Indeed, several media articles about Traders to Teachers indicate this. The Star Ledger reported that "Supporters called the bill a win-win for both the economy and the public school system, which is pressing to beef up math and science curriculum even as it faces a looming

shortfall of teachers in those fields" (Chambers, 2010). If this reporting is accurate, the state legislators who enacted the program identified a need for qualified math teachers.

I now make this tenuous alignment with the math teacher shortage stronger with an analysis of the ways in which this program contributes to an education for corporate profit. First, the Traders to Teachers programs contributes to merit pay in a different way than the previously analyzed programs. While specific compensation is not involved here, this tuition-free program establishes alternative "faster" routes to the credentialing process only for those interested in becoming math teachers. An equivalent is not provided to teachers in other subjects. The federal grant money and NJ state legislature enabling this program are clear messages that mathematics teachers are valued more by the government.

A clearer indication of this program's commitments to corporate profit can be found in the curriculum offered these former traders. The stated curriculum includes only courses in mathematics, the teaching of mathematics, and the observation and practice teaching in public schools. What is missing from this curriculum are general courses in learning theory and social foundations of schooling. Much of the teacher education debate centers on the inclusion of coursework outside what is deemed essential to managing a classroom and teaching a specific content area. For instance, The National Council on Accreditation of Teacher Education has received much criticism from the right regarding its "dispositions" standard, where teacher education curriculum should address teacher candidates' attendance to issues of social justice. As well, states like Pennsylvania have done away with coursework requirements in the foundations of education. Much of this push away from foundations has been disguised by an emphasis on shoring up the content knowledge of teachers.

This shift in emphasis towards content knowledge is seen throughout a variety of institutions working within and around education. It is clearly evident at the Federal policy level. For example, The Teachers for a Competitive Tomorrow is a 2011 US Department of Education program that provides grant monies to teacher education programs that "enhance content knowledge" for future teachers (US DOE, 2011). I should mention that this program, and others like it, do not necessarily denigrate courses in foundations or the usefulness of this knowledge in teaching. Rather, these programs imply

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teacher knowledge deficits in the status quo teacher workforce, and that teacher preparation should correct for said deficits. Therefore, the program can be said to reorient towards content knowledge while saying nothing about foundations courses.

In its program description, Traders to Teachers aligns itself with the idea that teachers only need coursework in the practical aspect of teaching. For this reason I will now argue that this assertion, coupled with the intended audience of the program, satisfies a specific agenda for education, namely the spread of unfettered capitalist dogma in the teaching force. The specific pathway to teaching being laid out increases the probability that a student in public schools will be taught by a teacher who supports corporate profit as the primary goal. We cannot forget that these teacher candidates come from a very specific environment of our capitalist world. I am speculating that their being laid off is not enough reason to alter their world view, and the prospect for empirical study to find out this question is fascinating. However, I can conclude that this program, at least as intended, does not offer these teacher candidates the chance to explore issues contrary to corporate dogma, as do other teacher education programs. To be clear, I do not expect teacher education programs to indoctrinate teacher candidates with world views. I expect they prepare future teachers by exposing and discussing with them a variety of world views and philosophies of education so as to develop their own.

Other implications of programs like *MfA* and *Traders to Teachers* come from a look at programs with similar approaches to teacher staffing shortages. *Teach for America* is a longstanding program aiming to staff high needs rural and urban school districts with people who have “strong academic records and leadership capabilities” (p. xi, Decker 2004). A Mathematica Policy Research, Inc. report presents data to cause concern for the program. The report claims many successes, such as “a positive impact on the math achievement of their students” (p. xiv). Despite this, one major criticism of the program comes from a look at the reports comparison of the backgrounds of teachers in a control group to a group of *Teach for America* teachers. The control group’s background more closely represented the students background, whereas “A majority (67 percent) of the TFA teachers were white, which contrasts sharply with the control teachers” (p. 16). The report indicates that such demographics reflect *Teach for America’s* structure, especially its recruitment from highly selective colleges. Similar to *MfA’s* aims in recruitment, such

structures lead to demographic mismatch between students and teacher.

Math for America acts in concert with other programs with similar aims. I have argued here that *MfA*, and similar programs, act in ways that mitigate democratic practice in schools. Furthermore, the organization in its entirety symbolizes perfectly the reason for mathematics' superiority. Concluding this analysis of *MfA*, I'll start by admitting, as a math enthusiast, it does feel nice to have your passion held in such high regard by society, to be able to gain employment more readily, to be able to charge \$100 an hour for your time with a HS student. However, I urge we enthusiasts to consider the source of our status as reason for its fallacy. Those of us who disagree with mathematics for human capital must resist the pedestal on which society has placed us; we must consider the ways we foster such status, e.g. by accepting remuneration such as that provided by *MfA* or by accepting grant monies tied to profit. As individuals and together as a community, we must take greater stances against these forces. For the true enthusiast who also embraces democracy and equal distribution of resources, doesn't *MfA* both as symbol and action amount to tragedy?

Finally, as to the issue in math teacher staffing that Ingersoll/Perda present, again I believe we true enthusiasts who have a particular persuasion can do a better job recruiting future math talent. I'd like to think that others shared my experience of choosing mathematics as a major because I enjoyed it. Just like the English major who is talented and passionate for the subject, I thought I was throwing caution to the wind when I declared my own passion for math. My personal path to teaching began with a passion for math that then paired with a world view like that of Gutstein's social justice above. More students of mathematical talent with a particular persuasion should be encouraged to teach high school, like I was. But another possibility exists, that a person with a particular persuasion could be drawn to mathematics. To dare to dream, contrary to recruiting mathematical talent for individual earning potential, I can imagine recruiting mathematical talent because some are attracted to its potential for social change.

i *MfA's* implicit support for teacher education is noted as inconsistent with other education reform organizations that shun teacher education, e.g. the Fordham Foundation (Walsh, 2006).

ii I do not suggest that democratic practice is otherwise perfectly functioning in

schools. Other aspects, such as administration, standardized testing and textbooks, can be argued to hinder the democratic practice in school sites but are behind the scope of this paper.

iii Empirical work on this group of individuals would be fascinating. I do not make any claims about the Fellows and Master Teachers of *MfA*, nor do I intend this paper to vilify them as individuals or a group. I sincerely applaud all teachers of mathematics in urban schools and encourage *MfA* teacher participants to question their participation in a program so significantly linked to an education with human capital as the primary aim.

iv Incidentally, the Robert Noyce Scholarship is a part of the America Competes Act ("Mission and Vision," 2010), similar to the National Math Advisory Panel as pointed out by Gutstein (2008).

References

- (2003). *Lifelong learning in the global knowledge economy: Challenges for developing countries*. Washington, DC: The World Bank.
- (2008, July 10). About Education and Human Resources. Retrieved from <http://www.nsf.gov/ehr/about.jsp>.
- (2010, April 20). Traders to Teachers. Montclair State University. Retrieved from <http://cehs.montclair.edu/cehs/academic/cop/t2t.shtml>.
- (2010, November 19). Supporters. Retrieved from <http://www.mathforamerica.org/about-us/sponsors>.
- (2010, November 19). The world's billionaires: #80, James Simons. Retrieved from http://www.forbes.com/lists/2010/10/billionaires-2010_James-Simons_5GZ7.html.
- (2010, November 19). Why major in mathematics? Retrieved from <http://www.math.uga.edu/~curr/WhyMath.html>.
- (2011, September 14). Robert Noyce Teacher Scholarship Program. Retrieved from http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5733.
- (2012, September 6). Math for America Announces 2012 Corps. Retrieved from http://www.mathforamerica.org/mfanews?p_p_id=62_INSTANCE_SSup&p_p_action=0&p_p_state=maximized&p_p_mode=view&p_p_col_id=column1&p_p_col_pos=0&p_p_col_count=3&_62_INSTANCE_SSup_struts_action=%2Fjournal_articles%2Fview&_62_INSTANCE_Ssu_p_groupId=1&_62_INSTANCE_SSup_articleId=590&_62_INSTANCE_SSup_version=1.0.
- (2013, January 16). Mission and Vision. Retrieved from <http://www.mathforamerica.org/about-us/mission-and-vision>
- (2013, January 16). Robert Noyce Teacher Scholarship Program. Retrieved from http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5733.
- (2014, August 4). Vision, Mission and Values. Retrieved from www.mathforamerica.org/about-us/mission-and-vision
- Apple, M. (1992). Do the standards go far enough? Power, policy and practice in mathematics education. *Journal for Research in Math*

Education 23, 412-431.

- Apple, M. (1995). *Education and power, 2nd edition*. New York, NY: Routledge.
- Bennet, A. (2009, September 24). Federal grant helps math for america in L.A. USC News, retrieved from http://uscnews.usc.edu/university/federal_grant_helps_math_for_america_la.html.
- Chambers, S. (2009, March 17). Turning ex-traders into new teachers: NJ taps wall st.'s jobless to fill instructor shortage. *The Star Ledger*.
- Chomsky, N. (1976). The relevance of anarcho-syndicalism. In B. Pateman (Ed.), *Chomsky on anarchism* (133-148). Oakland, CA: AK Press.
- Decker, P. T., Mayer, D. P., & Glazerman, S. (2004). The effects of Teach for America on students: Findings from a national evaluation. Princeton, NJ: Mathematica Policy Research, Inc.
- Ernest, P. (1998). *Social constructivism as a philosophy of mathematics*. Albany, NY: SUNY Albany Press.
- Greenspan, A. (2007). *The age of turbulence: Adventures in a new world*. New York, NY: Penguin.
- Gustein, E. (2006). *Reading and writing the world with mathematics: Toward a pedagogy for social justice*. New York, NY: Routledge.
- Gustein, E. (2008). The political context of the national mathematics advisory panel. *The Montana Mathematical Enthusiast* 5, 415-422.
- Harvey, D. (2005). *A brief history of neoliberalism*. New York, NY: Oxford University Press.
- Hersh, R. (1997). *What is mathematics, really?* New York, NY: Oxford.
- Ingersoll, R. & Perda, D. (2009). The mathematics and science teacher shortage: Fact and myth. *Consortium for Policy Research in Education*. CPRE Research Report #RR-62.
- Keeley, B. (2007). *Human capital: How what you know shapes your life*. Paris: OECD Publishing.
- Lockhart, P. (2009). *A mathematician's lament*. New York: Bellevue Literary Press.
- Patterson, S. (2010). *The quants: How a new breed of math whizzes conquered wall street and nearly destroyed it*. New York, NY: Crown Publishing Group.
- Pulliam, S. & Strasburg, J. (2009, May 15) Simons questioned by investors: Disparity is seen in running of two Renaissance funds. *The Wall Street Journal*.
- Rousmaniere, K. (1997). *City teachers: Teaching and school reform in historical perspective*. New York, NY: Teachers College Press.
- Simons, J. (2010, November 19). James Simons founder and director: Building a corps of strong math teachers [video file]. Retrieved from <http://www.mathforamerica.org/about-us/mission-and-vision>.
- Tyack, D. B. (1974). *The one best system: A history of american urban*

education. Cambridge, MA: Harvard University Press.

US Department of Education. (2011) Teachers for a competitive tomorrow: Frequently asked questions. Retrieved from <http://www2.ed.gov/programs/tct/faq.html>.

Walsh, K. (2006, March 16). Teacher education: Coming up empty. *Fwd: Arresting Insights in Education 3* (1). Retrieved from <http://www.edexcellence.net/doc/Teacher%20Education%20fwd.pdf>.

Zuckerman, G. (2005, July 1). Renaissance's man: James Simons does the math on fund." *The Wall Street Journal*.