# Allegato

**Sommario dell'Allegato**

### Table A1. Selected Foundations and Charities - United Kingdom

| | | |
|---|---|---|
| **1. The British Science Association** | Interview, Oct. 4, 2010 | Ms. Katherine Mathieson |
| **2. GTEP at Gatsby Foundation** | Interview, Oct. 5, 2010 | Ms. Dee Palmer-Jones |
| **3. Nuffield Foundation** | Interview, Oct 19, 2010 | Mr. Tom Anthony/Ms. Sarah Botting/Mr. Vinay Kathotia |
| **4. The Sutton Trust** | Interview, Oct 21, 2010 | Mr. James Turner |

### Table A2. Selected Foundations and Research Centres - United States

| | | |
|---|---|---|
| **1. William T. Grant Foundation** | Interview, May 10, 2010 | *Mr. Bob Granger* |
| **2. Wallace Foundation** | Interview, May 11, 2010 | *Mr. Edward Pauly* |
| **3. Toshiba America Foundation** | Interview, May 12, 2010 | *Ms. Laura Cronin* |
| **4. The Bill and Melinda Gates Foundation** | Interview, May 13, 2010 | *Mr. Joshua Haimson (Mathematica Policy Research)* |
| **5. Goldman Sachs** | Interview, May 13, 2010 | *Mr. Joshua Haimson (Mathematica Policy Research)* |
| **6. The Carnegie Foundation for the Advancement of Teaching** | Interview, May 13, 2010 | *Mr. Joshua Haimson (Mathematica Policy Research)* |
| **7. Institute of Education** | Interview, May 13, 2010 | *Mr. Bob Granger* |

*Sciences – IES*

| | | |
|---|---|---|
| **8. MDRC Policy Research** | Interview, May 13, 2010 | *Mr. Fred Doolittle* |
| **9. Mathematica Policy Research** | Interview, May 13, 2010 | *Mr. Joshua Haimson* |

## THE BRITISH SCIENCE ASSOCIATION

Established in 1831, the British Science Association is a charity established under Royal Charter aiming to a deeper integration between scientist and the population. Connecting science with people, promoting openness about science in society and affirming science as a prime cultural force through engaging and inspiring adults and young people directly with science and technology, and their implications, are its major undertakings.

The Association thus mainly operates as facilitator, supporting science by disseminating information and knowledge through the general public, and students in particular. To this purpose, BSA organises major initiatives across the UK, including the annual British Science Festival, the National Science and Engineering Week, regional and local events, and an extensive programme for young people in schools and colleges.

Particularly, the British Science Association offers a wide range of science, technology, engineering and maths (STEM) enrichment activities to inspire and engage students, among which the two UK-wide award schemes (CREST and CREST Star Investigators) that provide opportunities for 5-19 year-olds to solve scientific problems through practical investigation.

For younger students aged 5-12, there is CREST Star Investigators. The activities focus on thinking about, talking about, and doing science. They are designed to be used primarily outside of class time (e.g. in a science club), though some are suitable for use in the classroom.

Through CREST (Creativity in Science and Technology), young people aged 11-19 can explore the real nature of STEM by doing their own creative solving through mini projects. The scheme provides students with a valuable insight into what these subjects are really like. Students who have gained CREST Awards have the opportunity to celebrate their achievements by participating in regional fairs, where they can also compete for the chance to attend the national CREST final at "The Big Bang: UK Young Scientists and Engineers Fair" (generally in March every year). The final of the National Science Competition also takes place at The Big Bang Fair.

The Association is governed by a Council, which forms the Board of Trustees, and is managed by a rather small professional staff, with around 30 people in the national office in the Wellcome Wolfson Building in South Kensington, London and 5 regional staff across the UK. The 16 scientific sections of the British Science Association, which contribute primarily to the annual British Science Festival, are run by committed

volunteers. So too are the 30 or so branches, which organise events and activities locally across the UK.

Priorities and lines of activity are defined autonomously by the Board of Trustees, taking into account the fundamental values and goals of the Association and results of preliminary investigation with practitioners and stakeholders in the education sector. This preliminary research is not publicly available and decisions are taken independently of government and administration objectives.

The BSA is not a grant-maker body, this meaning that in order to pursue its goals and develop its programmes it relies on the collaboration and the financial resources by other charities/foundations and other bodies. This is especially true for the National Science and Engineering Week, a UK-wide, 10-day celebration of science and engineering run on behalf of the government and involving schools and communities, as well as the 1-week long British Science Festival.

For the purpose of this work, in the following we focus on the above mentioned CREST programme, the BSA flagship educational programme aimed at bringing scientists and "translators"/communicators of science in contact with young people.

In terms of the analytical categories outlined in Section 3 of the Report, CREST typically aims at enriching the curriculum (line 1), enhancing students' skills (line 5) and to a certain extent (see below) also rewarding smarter students (line 3).

## CREST Awards

Established over 23 years ago, CREST is Britain's largest national award scheme for project work in the STEM subjects (Science, Technology, Engineering and Maths). The framework primary objective is to make young students learn and like science, by doing science.

*Target group and selection*
Young people aged 11-19.

In most cases teacher registers students/project with the BSA local coordinator, while a minority directly registers after simply looking at the website.

In case of bronze awards (see below) it is usually teachers who take the lead and decide to have an off-curriculum day in order to develop a CREST project. As for the Silver and the Gold levels, generally students with aptitude and interest in science engage only. Students may select their project directly on BSA's website.

The registration fee is currently £4 per student.

*Content and goal*

It gives opportunities to explore real world projects in an exciting way. CREST links closely to the curriculum and is a great way to make STEM creative and engaging – both in and out of the class.

CREST Awards are flexible – they can link into work experience placements, after-schools clubs or several linked schemes. Some projects might be done in one day – others over several months. Students can investigate or design and research a subject, or design a science communication project.

After completion of their projects, students get "bronze", "silver" or "gold" awards (consisting of a certificate) depending on the relevance and the duration of the project.

The levels are progressively more complex and challenging, but can be awarded separately at any stage:

*Bronze level*
- 10 hours of project work
- Can be completed as individual or team project
- Typically completed by 11-14 year olds

*Silver level*
- 30 hours of project work
- Can be completed as individual, team project or club activity (assessment is based on individual achievement)
- Typically completed by 14-16 year olds

*Gold level*
- 70+ hours of project work
- Can be completed as individual, team project or club activity (assessment is based on individual achievement)
- Typically completed by 16+ year olds

Differentiated levels enable youngsters of all abilities to experience positive achievement in Science, Engineering, Technology and Maths (STEM) and cover many of the required key skills in the process.

Essentials at any level
First, a CREST activity must offer students the opportunity to:
- practise existing scientific and technological skills and experience and develop new ones
- follow a science/technological process
- demonstrate individualised and independent learning
- apply their work to a 'real world' context
- research and make use of material and human resource

- demonstrate some creativity or innovation in their work
- communicate their work to audiences, both expert and non expert
- consider the broader implications of the work of scientists and technologists

Second, all students monitor their progress with the aid of a Profile Form. Profile forms are available at each level.

Projects selected/proposed by the students have to be approved by teachers and, in some cases, mentors. Progress is monitored by teachers and/or mentors, depending on the award level, and the same goes for the final evaluation.

Assessment of CREST Awards

CREST projects are assessed once students have completed their project work and have filled in their Profile Forms. This should be used by students as a point of reference and record throughout their projects. The design of the Profile Form prompts students to address each award criteria and encourages them to work through these in a sequential manner. Profile Forms are available at each award level and are sent out to students following registration with the Local Coordinator.

The assessment process includes various steps. Initial assessment is carried out by the supervising teacher who, once satisfied that the student has put in the necessary time and reached a suitable standard, will contact the Local Coordinator to assess the project and sign off the Profile Forms. During the assessment, students may be asked to present their work to the Local Coordinator/project mentor, either by producing a poster or giving a talk. They should be able to demonstrate that they have worked through the processes outlined in the Profile Form. Students should be able to explain what they did and why, have presented their data in an appropriate way and drawn logical conclusions. They should understand how their results fit in with their background knowledge and research. Projects with an industrial mentor should explore the wider applications of the project work.

In case of Bronze award assessment, the project can be assessed internally, by another teacher from the school. Students should have completed their Bronze Profile Form and may have written a short report or given a presentation of their work.
Differently, for Silver and Gold assessment the project must be assessed by an external person, usually the local coordinator, the project mentor or another person from the same organization.
Upon assessment the local coordinator will either agree to issue the award, or may recommend that the students do further work.

*Figures*

Since the start of the programme over 300,000 young people have achieved CREST Awards. In the last year alone over 25,000 CREST Awards have been undertaken.
The schemes is funded through government grants, sponsors and fees.

*Promotional activities*
Due to its long history, CREST is widely known across Great Britain. Thus information usually circulate by word of mouth, especially via teachers and school leaders, in addition to leaflets and brochures prepared by the BSA. Recently, however, the association has increasingly relied on its website in order to provide information to interested students, teachers and others.

*Evaluation*
The programme is independently evaluated by external institutions. In 2007 evaluation was carried out by the University of Liverpool and these were the main conclusions, in brief:
"These findings indicate that CREST has a strong positive impact on students. Data suggest that students gain knowledge and develop a number of skills. Attitudes towards SET and aspirations for SET careers are also significantly improved. Importantly, involvement in the scheme appears to encourage students to continue with the study of SET subjects. There are also benefits for teachers and schools that participate in the scheme." (*CREST awards evaluation. Impact study,* University of Liverpool).
A more in depth analysis reveals that involvement in CREST is likely to increase interest and motivations especially among students that are already most interested in Science, Engineering and Technology (SET). Nevertheless, "the data also show that some students that were ambivalent beforehand have also experienced a positive impact, as have some that were previously disinterested" (ibidem, p. 43).
According to teachers perception, CREST major effects can be found with respect to:

| | | |
|---|---|---|
| Stimulating interest and/or motivation | | 23% |
| Giving a broader experience of science | | 20% |
| Rewarding for students | 6% | |
| Building confidence | 5% | |
| Developing transferable skills | | 4% |
| Others | 5% | |

CREST is therefore an example of curriculum enrichment and skill enhancement programme directed to a broad audience (lines 1 and 5).
Nevertheless, for students CREST Awards (especially at the "gold level") are a tangible recognition of success – e.g. they can be included in personal records of achievement and used to enhance applications to universities, colleges and potential employers; therefore the programme seems also to be an effective instrument for talented students (*interviews 1/3UK*).

Similarly CREST is likely to put bright students on a more competitive route leading to both the National Science & Engineering Competition (NS&EC) and The Big Bang: UK Young Scientists' and Engineers' Fair (see below).

The BSA is currently engaging with European and Asian institutions in order to export CREST.


## National Science & Engineering Competition NS&EC

This is a nation-wide competition sponsored by the Department for Business, Innovation and Skills and run by the BSA. It represents the next step on the way to excellence as it awards prizes to 12 winners, 12 runners-up and 36 highly commended individuals and teams upon completion of projects in the fields of Science/Maths and Engeneering/Technology.

It developed out of previously existent schemes aimed at CREST awarded students. With the help of the government the latter were extended in order to make the competition more inclusive and properly nation-wide. It is very meritocratic and targeted to identify excellence *stricto sensu* (line 3).

*Target group and selection*

Entrants must be aged 11-18 inclusive and in mainstream secondary education (i.e. secondary school, home-school, sixth form college, FE college). Entry is via the Big Bang Regional Fairs or the online entry form.

In 2010, 59% of finalists (table A3 below) and 57% of winners came through the self-nomination route, with the remainder being selected by judges at regional Big Bang fairs (there was one in each English region and one each in Scotland, Northern Ireland and Wales).

Table A3. Proportion of projects in each category compared by route to the finals

| | Individuals | | | Teams | | | Total % |
|---|---|---|---|---|---|---|---|
| | E/T* | S/M** | Total | E/T | S/M | Total | |
| Regional | 33 | 8 | 41 | 20 | 16 | 36 | 40.5 |
| Self-nom | 9 | 73 | 82 | 19 | 12 | 31 | 59.5 |
| Grand Total | 42 | 81 | 123 | 39 | 28 | 67 | 100 |

*E/T = Engineering/Technology stream*
**S/M = Science/Maths stream*

*Source: NSEC Evaluation Report 2010*

Many students involved in CREST run for the NS&EC and roughly 75% of the finalists previously received CREST awards.

Around half of CREST Award holders had also participated in another scheme, mostly Nuffield bursaries (see below). 20% of finalists and 21% of winners had competed in the Young Engineer for Britain competition.

Data on the Nuffield involvement of entrants at the regional fairs is not available. However, the online entry form for self-nomination entrants did ask competitors about whether they have been involved in the Nuffield bursaries scheme. 3 of the team projects reported involvement in Nuffield bursaries, out of a total of 36 team entries. 102 of the individual project entries said they had participated in Nuffield bursaries, out of a total of 116 entries (table A4).

Table A4. Number and proportion of Competitors with Nuffield bursaries

|  | Number of Nuffield Projects | Total number of projects | % of Nuffield projects |
|---|---|---|---|
| Self nomination entrants | 105 | 152 | 70% |
| Finalists | 70 | 190 | 37% |

*Source: NSEC Evaluation Report 2010*

*Figures 2010*
190 projects presented involving 354 students
Duration: 3 days
Awarded prizes: 56
Prizes are sponsored by academic institutions as well as foundations.
*Content and goal*
The most popular disciplines for projects in the finals of the Competition are those which closely correspond to curriculum subjects. The two most popular subjects overall are biology and engineering (Table A5).

Table A5. Disciplines of the finalist projects

| Discipline | Total number of projects | % of projects |
|---|---|---|
| Biochemistry | 7 | 3.7 |
| Biology | 53 | 27.9 |

72

| | | |
|---|---|---|
| Biology/Medicine | 7 | 3.7 |
| Chemistry | 12 | 6.3 |
| Communication | 3 | 1.6 |
| Engineering | 76 | 40.0 |
| Geology | 1 | 0.5 |
| IT | 4 | 2.1 |
| Physics | 26 | 13.7 |
| Textiles | 1 | 0.5 |
| Totals | 190 | 100.0 |

*Source: NSEC Evaluation Report 2010*

Judging and prizes are separated into three age categories according to the entrant's age: Junior - Age 11-14 inclusive; Intermediate - Age 15-16 inclusive; Senior - Age 17-18 inclusive

*Junior Category prizes***:**
• winners: £1000, a trophy and a framed certificate
• runners-up: £300, a medal and a certificate
• highly commended: £100, a medal and a certificate

*Intermediate Category prizes*
• winners: £1500, a trophy and a framed certificate
• runners-up: £500, a medal and a certificate
• highly commended: £125, a medal and a certificate

*Senior Category prizes*
• Team Winners: £2000, a trophy, a framed certificate and an experience prize
• Individual winners: title "UK Young Scientist of the Year" or "UK Young Engineer of the Year" as appropriate, £2000, a trophy, a framed certificate and an experience prize.
• runners-up: £700, a medal and a certificate
• highly commended: £150, a medal and a certificate

There is one individual and one team winner in each age category for the science/maths stream and for the engineering/technology stream. The two individual winners in the senior category are given the titles the "UK Young Scientist of the Year" and the "UK Young Engineer of the Year".

Further runners-up and highly commended prizes are also allocated within each age category and stream. Other prizes are also available but some of the experience prizes have age restrictions and other rules which must be adhered to and are only awarded where these criteria have been met.

Prizes are awarded at "The Big Bang: UK Young Scientists' and Engineers' Fair" (see below), the setting for the finals of the National Science & Engineering Competition.

The internal evaluation report on the 2010 NS&EC shows a high level of appreciation of the programme by participants. More interestingly, being involved in the competition increases students' interest and motivation in STEM subjects (see figures A1 and A2 below):

"Half of the competitors said they were more likely to continue studying science subjects after attending the fair. Just over half said that they were more likely to pursue a career that required a STEM qualification. Two-thirds of competitors felt that they had a better understanding of why employers like to employ people with STEM qualifications" (National Science & Engineering Competition, Evaluation report, p. 3)

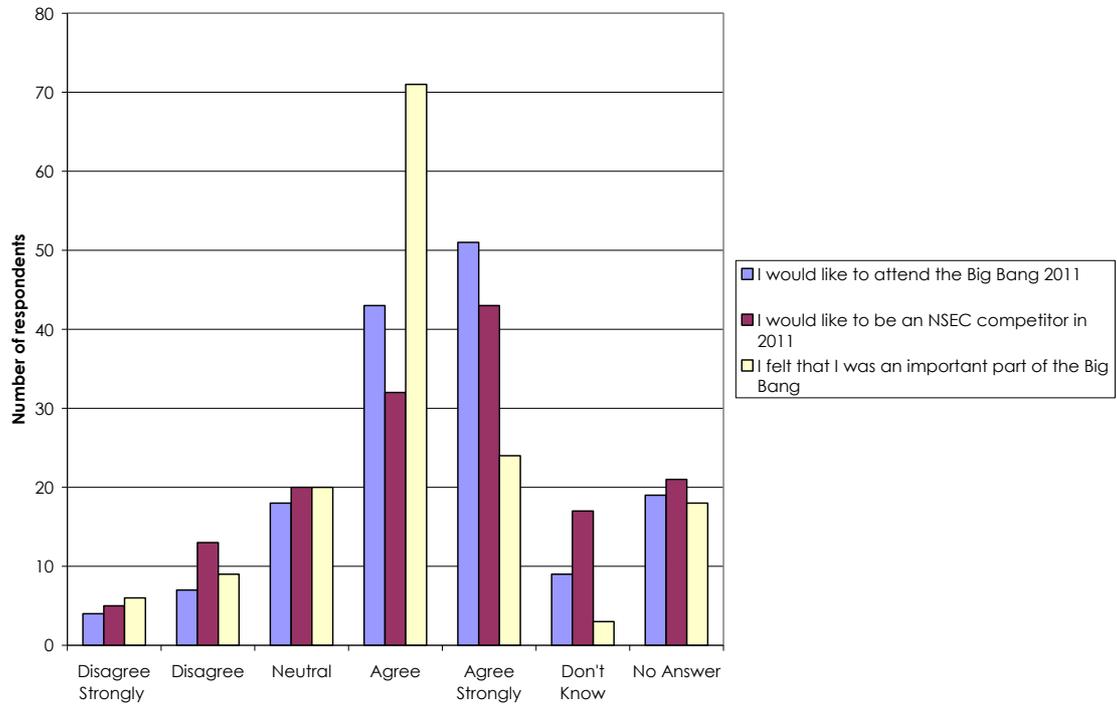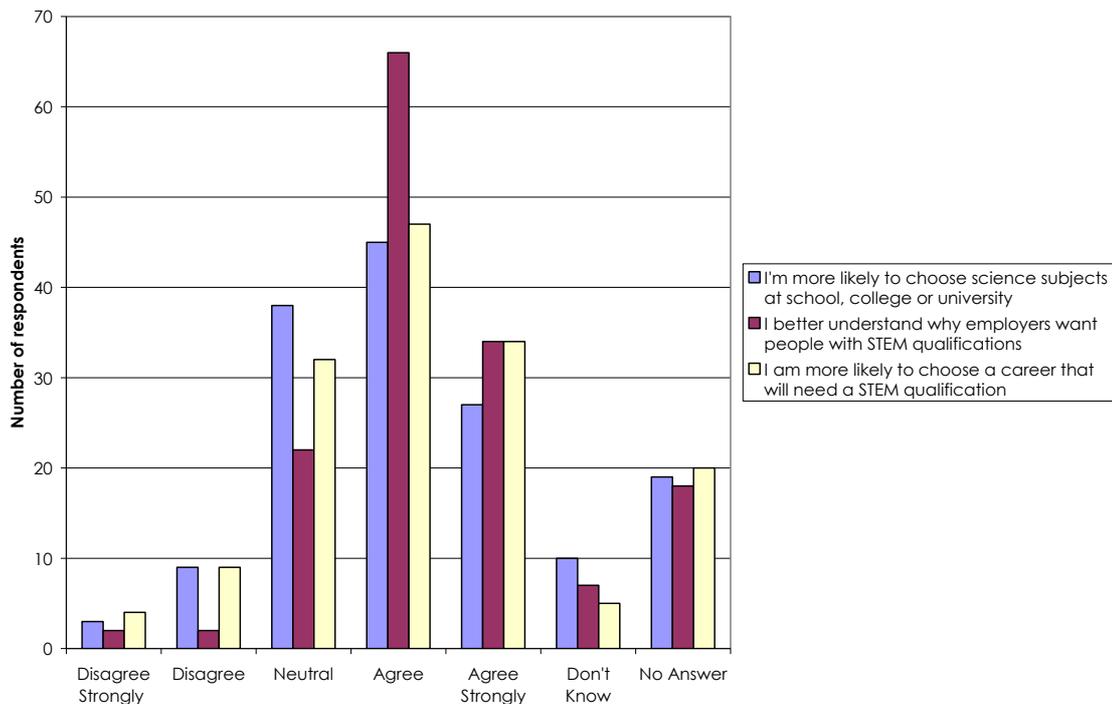Figure A1. Participants' appreciation of NS&EC



Figure A2. Competitors' views on benefit from participating in the Competition finals

**The Big Bang: UK Young Scientists' and Engineers' Fair**

The Big Bang is a free, annual event inspiring young people in Science, Technology, Engineering and Maths. There is lots to get involved with - workshops, exhibits and shows. The next Big Bang will be held at London's ExCel on 10-12 March 2011.

The Big Bang is a an opportunity for students from all backgrounds to mix and compete with the country's best. Plus they get a unique chance to quiz scientists and engineers from the business world, also exhibiting at the event.

The Big Bang: UK Young Scientists' and Engineers' Fair is also the setting for the finals of the National Science & Engineering Competition. The lucky finalists with the best projects will be invited to The Big Bang to showcase their work to over 20,000 visitors, including students, journalists, celebrities and VIPs.

Judging starts on day one of The Big Bang with finalists shortlisted for judging again the next day. Day two ends with a prestigious awards ceremony where winners of the National Science & Engineering Competition are announced - plus the individual winners of the senior age category are crowned UK Young Scientist of the Year and UK Young Engineer of the Year.

## NUFFIELD FOUNDATION

The Nuffield Foundation is a charitable trust established in 1943 by William Morris, Lord Nuffield, who aimed to contribute to improvements in society, including the expansion of education and the alleviation of disadvantage. He called this the 'advancement of social well-being', and emphasised the importance of education, training and research in achieving that goal.

The foundation currently works to improve social well-being by funding research and innovation in education and social policy. It mainly operates in the UK, but also in Europe and Eastern and Southern Africa.

As for financing, Nuffield does not fundraise or receive funding from the Government. In order to maintain its independence it draws incomes from the interest on its investments.

As for interventions in the British educational sector, over the last 60 years Nuffield has developed a wide range of classroom and professional development resources for teachers in science, mathematics and other subjects. Apart from funding research projects, it has particularly focused on developing new curricula, as well as teaching and learning resources (line 2), but it also set up schemes to promote excellence in a narrow sense, like for example the Bursaries programme (line 3, see below).

*The curriculum project* is a milestone behind Nuffield's international reputation, since the development of the first science projects in the 1960s, which went round the world and were translated into many languages, and big projects in languages, classics and the humanities. Subsequently the main focus has been on science, maths and technology. However the Foundation has continued to support imaginative initiatives funded by creative people in other fields.

The main purpose is to explore new approaches to teaching and learning, by developing, managing and supporting curriculum projects, also in partnership with other institutions. Curriculum development is made in collaboration with teachers and researchers across the UK, as well as with publishers and, where appropriate, awarding bodies, to share the best of current thinking with schools and colleges. The major partner is the Science Education Group at the University of York. Projects with York include Twenty First Century Science, Salters-Nuffield Advanced Biology and Science in Society.

Developing a curriculum means defining the structure of the course, the exam, etc..; then courses are presented to the governmental agencies for approval and authorization. After authorization the schools may decide to buy the course, which also includes a specific type of exam and related textbooks.

Recently Nuffield has started to work with the "teachers learning centers" run by the Wellcome Trust in order to enhance teachers' educational ability.

In the field of *Maths Education* Nuffield is committed to support research and development projects designed to improve policy and practice in the teaching and learning of mathematics, with particular reference to:
- identifying methods to help children best acquire the foundations of mathematical thinking in the early years, and subsequently learn mathematics in primary school, as well as evaluation the implications of this for curriculum, assessment and pedagogy;
- discovering how policy and practice – and in particular curriculum, qualifications and pathways - might support increased participation and achievement in mathematics-related learning post-16;
- shedding light on how such pathways may better support subsequent studies in further and higher education, employment and citizenship, particularly for those not continuing with mathematics;
- supporting quantitative skills and in particular statistical literacy in young people and in the population at large.

Also Nuffield's efforts focus on *Secondary Education transitions*, with the aim to improve understanding of the significance and impact of transitions into, through and out of secondary education. The major interest is in proposals addressing issues of policy and practice relating to progression and movement through institutions and phases; the role of schools in supporting these transitions; and the value that can be added by other educational and local agencies.

Of particular interest, with reference to the specific focus of this report, seem to be actions taken within the "Building capacity in science and research" branch, among which the **Science Bursaries** program, aimed at helping 16-18 year olds embark on successful careers in science and research.

## Science Bursaries

The scheme was started by an autonomous decision by trustees with reference to the overarching goal and commitment to supporting science and research.

It offers bursaries for students to work alongside practising scientists, technologists, engineers and mathematicians.

*Target group and selection*
Students aged 16-18 enrolled in a post-16 science, technology, engineering and maths (STEM) course are eligible to apply.

The central office is in charge of strategic development of the programme, general organization and monitoring, while local coordinators manage particular territorial areas, interacting with the students, carrying out the selection process and establishing relationships with the providers of placements. There is a network of 22 coordinators across 12 regions.

Students apply either individually or through their teachers, by contacting the regional coordinator. In selecting students attention is paid to the subjects they are interested in as well as the school they come from, with a cap to students coming from independent/private schools. More precisely, selection criteria are not (too) rigid. Coordinators are asked to look for the students with the enthusiasm and motivation to make the most of the scheme – this does not necessarily always mean those with the top grades. Coordinators are also asked to spread the bursaries over the range of STEM subjects. The gender balance has to be respected, aiming to have a roughly 50:50 gender split. Also, in terms of schools, only 20% of bursaries are allowed to be allocated to independent (fee-paying) schools. There is also a maximum number of bursaries per school so that more schools are able to have access to the scheme. The Coordinators have thus to juggle these priorities in order to get the best students for the scheme, and ensure that it is open to all.

*Content and goal*

Selected students receive a bursary of £80 per week to support them during their project.

Placements duration varies between 4 and 6 weeks during the summer holidays, giving students an insight into the world of scientific research and development.

Placements are available across the UK, especially in universities but also in private companies (mainly in the industrial sector) and research centres and institutions.

Nuffield sets a number of criteria for projects – such as having a clear scientific or technological content, or the fact that students may develop a discrete project they can take ownership of – and generally students work on very specific issues or pilot research in collaboration with their supervisor. Due to the age of the students, in most cases projects are proposed by providers to local coordinators.

Students who undertake a Nuffield Science Bursary are also invited to attend a Nuffield Celebration Event organised by their Nuffield Coordinator. This offers students involved in the scheme an opportunity to display what they have achieved during their bursary placement, and enables them to meet and discuss it with other bursary students, supervisors and guests from the science, technology and engineering sector.

Also students may combine the bursary placement with the British Science Association CREST award. By completing a CREST award students are then eligible to self-nominate for a place at "The UK Young Scientists' and Engineers' Fair" and may be picked to represent their region at the British Science Association CREST National Science Fair. In case of non selection, students may also self-nominate their project.

For teachers, having students involved in bursary placements brings added value: a) Developing contacts with working scientists, technologists, engineers and mathematicians in industry and research institutions; b) Improving links with Higher Education in your area; c) Raising the profile of the School/College within the local community; d) Inspiring students to consider higher education and careers in science, technology, engineering and maths.

As to providers, hosting a placement can spread knowledge of organisation's activities as well as bring fresh-thinking to your existing projects, develop staff skills through the mentoring of bursary students, strengthen education/industry links and demonstrate commitment to education.

*Figures*

The programme was started in 1994 on a small scale, with about 40 bursaries, then growing to 210 in 1995. After it was launched nationally in 1996, it quickly took over, reaching around 500 bursaries in the mid-2000s.

In 2009, 1010 funded places were offered to students, with an increase of 12% compared to 2008 and almost 100% since the start of its expansion in 2006.

Nuffield plays a major role in funding the scheme, which however also receives financial resources from other institutions as reported in the table A6.

Table A6. Number of placements funded, 209

| | |
|---|---|
| Nuffield | 762 |
| Wellcome Trust | 100 |
| Royal Society | 25 |
| Research Councils UK | 100 |
| Society for general microbiology | 10 |
| Engineering technology board | 13 |
| | |
| *TOTAL* | *1010* |

As for the project providers, table A7 reports data for the year 2009.

Table A7. Project providers, 2009

| | N° | % |
|---|---|---|
| University | 564 | 56 |
| Research institute | 153 | 15 |
| Company | 119 | 12 |
| Hospital, Nhs Trust, Health | 96 | 10 |

| | | |
|---|---|---|
| centre | | |
| Field centre and zoo | 12 | 1 |
| Museum | 7 | 0,7 |
| Other (park, charity, etc) | 59 | 6 |

In 2010, Nuffield expenditure for grants only within the Bursaries programme has been around 600.000 Pounds

*Promotional activities*

The scheme is promoted at the regional level with some variations across regions. Coordinator or formerly involved students may go to give talks and present the programme in schools, especially in those areas where it is not well known.

*Evaluation*

Nuffield's programmes are externally evaluated every five year. In house evaluation is carried out every year dealing with organizational and finding issues as well as providing feedbacks from the students involved, the teachers and the providers. Comments from all of them are generally very positive.

As for teacher and project providers, the following passages from the report underline the appreciation by both groups:

"Teachers highly value the bursary programme and recognise the skills and benefits that the programme can offer which cannot be delivered through school. Teachers also commented on the confidence of students following the bursary experience and understanding of skills needed to pursue a STEM career.

The feedback from teachers also expressed the real value and relevance of the bursary programme towards new courses and qualifications that are developing and where student uptake is increasing in courses such as the Extended Project Qualification (worth an AS level) and the development of the new Scottish Baccalaureate. The experience is also something that student's value on their UCAS application

Project providers are asked each year to comment on the key benefits of getting involved with the bursary programme. Most project providers highlight the opportunity to help the next generation of scientists to make some good decisions and also gain an insight into the school environment and interests of the general public".

(Nuffield Foundation Science Bursaries for Schools and Colleges - Report on the 2009 Programme, pp. 3-5).

Also, the programme fares well in terms of beneficiaries' satisfaction, as reported in the following abstract from the Nuffield Foundation Science Bursaries for Schools and Colleges - Report on the 2009 Programme, page 10:

"Each year we ask students what they thought of their experience. Their responses are summarised below.

| The project provided me with: | **Agreed** | **Disagreed** | **NA** |
|---|---|---|---|
| Experience of the world of science and an understanding of how science is carried out | 866 (97%) | 18 (2%) | 7 (1%) |
| Laboratory experience and skills | 838 (94%) | 43(5%) | 10(1.%) |
| The chance to meet working scientists | 839 (94%) | 40 (4%) | 19 (3%) |
| Useful knowledge that will help me on my course | 831 (94%) | 57 (6%) | 3 (%) |
| Experience of working in a team | 707 (79%) | 169 (20%) | 15(1%) |
| Opportunities to put my scientific knowledge into practice | 811 (91%) | 75 (8%) | 5 (1%) |
| Opportunities to improve my communication and presentation skills | 813 (91%) | 70 (8%) | 8(1%) |
| An enjoyable and interesting experience | 864 (97%) | 5 (1%) | 22 (3%) |
| Increased self-confidence | 822 (92%) | 67 (7%) | 2 (1%) |
| I was well prepared for my project | 776 (87%) | 109 (12%) | 6 (1%) |

As in previous years, the majority of students (97%) find the bursary experience enjoyable and interesting. They also find that it is an excellent opportunity to get an insight into how science is carried out"

## GTEP at the GATSBY CHARITABLE FOUNDATION

The Gatsby Charitable Foundation was established in 1967 by David Sainsbury. It is currently overseen by a small group and relies on a professional but agile organization.

The Foundation is an endowed grant-making trust. Its Trust Deed states that it has general charitable objectives. The Trustees can therefore give money to any charitable cause. The Foundation's capital - its expendable endowment - has all been provided by the founder. The Trustees make grants by using the income and occasionally by drawing on the capital. Gatsby generally does not fundraise and make grants to individuals.

Over more than 40 years of grant-making, the Trustees have decided to focus institutional activity on a limited number of fields. Current grant categories are the following: a) Plant Science, to develop basic research in fundamental processes of plant growth and development and molecular plant pathology, to encourage young researchers in the field of plant science in the UK; b) Neuroscience, to support world-class research in the area of neural circuits and behaviour, and in the area of theoretical neuroscience; and to support activities which enhance our understanding in this field; c) Science and Engineering Education, to support improvement in educational opportunity in the UK for a workforce that can better apply technology for wealth creation by incubating innovative programmes in the field of science and engineering education and promoting excellence in teaching and learning; d) Africa, to promote economic development and income generation through selected programmes supporting small scale manufacturing and enterprise and market sector development in selected African countries; e) Institute for Government, an independent centre available to politicians and the civil service, focused on making government more effective; f) Arts, to support the fabric and programming of institutions with which Gatsby's founding family has long connections; g) Mental Health, to improve the quality of life for people with long-term
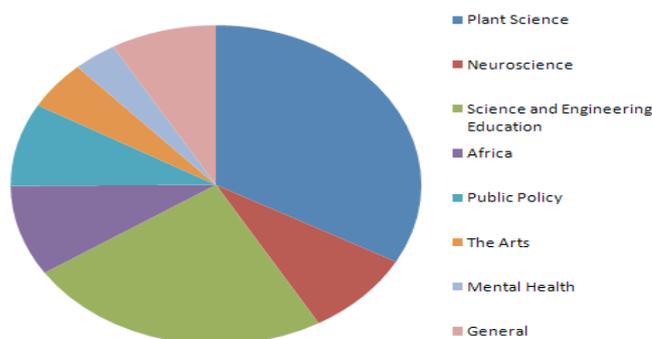
problems by improved delivery of services.

Figure A3. Grant payments across fields, 2009

Fields of activity and goals are adapted over time with the help of external advisers and through interaction with the organisations whose work has been helped by the Foundation.

**The Gatsby Technical Education Projects (GTEP)** was established by the Trustees of the Gatsby Charitable Foundation in 1996. GTEP is a registered charity and a company limited by guarantee.

GTEP develops and manages a range of innovative programmes in the field of Science, Technology, Engineering and Mathematics (STEM) education, receiving the vast majority of its funding from the Gatsby Charitable Foundation.

Since 1996, the Foundation has awarded grants over £115 million to around 400 projects in STEM education and GTEP has managed or advised on the development of most of these.

| The Teacher Effectiveness Enhancement Programme (TEEP), since 2002 |
| --- |

*Content and goal*

Typically a professional training action for teachers, the programme provides quality continuous professional development in the innovative TEEP model of effective teaching and learning (line 2).

Training is offered in Birmingham, Dudley, Hull, Sunderland, Hartlepool, Middlesbrough, and Suffolk. TEEP training is also included in the menu of support for the Black Country challenge.

*Figures*

Started in 2002 with a grant around 1 million Pounds, the first phase of TEEP was concluded in 2004 (3-year programme).

 The second phase was financed with a grant totalling over £ 2 million, it ended in Dec. 2007 and underwent independent evaluation as well. Both evaluation reports acknowledge the effectiveness of the programme.

TEEP originally involved around 40 teachers per year; in 2009 teachers involved were over 1500.

*Promotional activities*

What is interesting here is that GTEP has not invested much in promoting the programme, rather the diffusion of the programme was mostly due to words-of-mouth.

*Evaluation*

Since the beginning the programme has been subject to external independent evaluation.

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**Teach First: Teach First Plus, 2004-2007**

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This is a peculiar programme bridging actions directed to best performing (teachers) and interventions targeted to disadvantage students.

It aims at transforming exceptional graduates into inspirational teachers, placing them into challenging London secondary schools. GTEP's support allowed the programme to put in place measures to improve the retention of science, maths and design and technology teachers in these schools. These interventions included the development of a new Education Major as part of the leadership training and conferences and awards focussing on best practice in schools.

The two programmes listed below are typical examples of initiatives aiming jointly at Curriculum development, promoting teachers professional development and enhancing students' expertise in both Science and Physics.

*Science Enhancement Programme, since 1998*

SEP aims to stimulate innovative practice in school science through the production of novel, low-cost classroom resources and by supporting science teacher professional development.

Over 10,000 science teachers have joined the SEP Teacher Associates scheme and SEP resources are now used in the vast majority of UK secondary schools.

*Physics Enhancement Programme, since 2003*

The Physics Enhancement Programme (PEP) is a partnership project with the Training & Development Agency for Schools (TDA) and the Institute of Physics (IOP) to increase the number of specialist physics teachers trained each year by recruiting from a wider degree base. PEP offers courses in physics subject knowledge prior to entering formal teacher training and provides support and mentoring during training and after qualification. The success of the mentoring programme has led to a pilot offering mentoring to all new maths and science teachers.

*PGCE+, National Academy for Gifted and Talented Youth (NAGTY), 2003-2006*

Targeted to talented students, this programme seems to have been harshly contested and it has encountered major opposition in the implementation phase.

85

The PGCE+ programme provided recently qualified teachers with expertise in the teaching of gifted and talented pupils, working alongside the NAGTY Summer Schools and with school-based support through their early years of teaching. The Summer School courses provided a unique opportunity to observe and contribute to the teaching of some exceptionally able young people. The programme also involved lectures and workshops delivered by experts in the field of gifted education. Participants received ongoing support through their early years in teaching in the form of mentoring, access to conferences and on-line support from NAGTY, including a discussion forum.

## THE SUTTON TRUST

The Suttton Trust is a fairly new institution, founded in 1997 by Sir Peter Lampl with the aim of promoting social mobility through education. It has funded a wide range of access projects in early years, school and university settings, and now focuses on research, policy and innovative practical projects with a system-wide relevance.

The Trust exists to combat educational inequality and prevent the subsequent waste of talent. It is particularly concerned with breaking the link between educational opportunities and famliy background, and in realising a system in which young people are given the chance to prosper, regardless of their family background, the school they happen to attend or the area in which they live.

As disadvantage starts before young people are born and continues through to the workplace, the Trust's interest covers parenting and early years projects; primary and secondary schooling; and access to university and the professions. At later ages Sutton has a particular focus on academically talented young people with the potential to study at leading, highly-selective universities.

Since 1998 the Trust and its partners have committed £30 million to educational access projects and research.

The Trust not only undertakes research and advocates policy change, but also funds, develops and tests innovative practical solutions to educational inequality. Most project work has a particular, but not exclusive, focus on young people from non-privileged backgrounds with academic talent. A number of our initiatives are aimed at ensuring this group make the most informed and appropriate choices for their futures; and that these choices are not prejudiced by a lack of aspiration or misinformation.

The Trust is now focusing on research and policy work, and will only be funding a select handful of small scale pilot projects, envisaging that most of these projects will be developed through existing contacts and partnerships.

The Trust aims for a school system in which young people's achievement is not tied to their social and economic background. A priority is to favouring access to schools and combating the social segregation which blights the current system.

The Trust also recognises the importance of out-of-school activities in developing disadvantaged young people's confidence, resilience and soft skills - important influences on future life chances.

Recently the Trust, though recognising that there are other areas which are relevant to institution's over-arching agenda of reducing educational inequality, has defined the following area as its priorities for the next few years, to which all work and funding will be directed.

* Parents as first educators - narrowing gaps in school readiness and boosting cognitive development for non-privileged children
* Free schools and equity
* Encouraging the most effective teachers to serve in the most challenging schools
* Boosting provision for gifted and talented students from non-privileged backgrounds
* Access to highly selective universities and courses and the professions
* Understanding the drivers of social mobility

Sutton Trust is therefore a charity deeply committed to the sector of education, running a number of programmes that stretch along the various education stages, from pre-school to university. Most of the activity aims to prepare students, generally 15 to 18 years old, for the university.

Within this general framework, what seems to distinguish Sutton is the peculiar approach followed in promoting excellence through actions directed to equip students for further education. Actually Sutton is primarily concerned about helping bright smart living in a disadvantaged environment to get ready for college. In doing this, Sutton thus jointly pursues goals 3 (support to bright students) and 4 (actions to counteract disadvantaged contexts) outlined above.

More precisely, Sutton applies a sort of "pyramidal" approach to disadvantage in moving from pre-school to access to university: in the early years – when it is more difficult to distinguish brighter pupils from underprivileged environments – programmes are targeted to whole disadvantage group, while they become more focused on smarter disadvantaged students only in the last stages of secondary school.

Generally the Sutton strategy is based on the following stages:
- One: evidence based identification of problems to be addressed and possible solutions through in-house or, in some cases, outsourced research (eg. currently the Trust has started a research, firstly based on the literature review, on the criteria to identify best teachers);
- Two: development of a pilot programme, to be implemented on a small scale. As the Sutton is a grant maker charity, generally it provide funds to universities or delivering charities that actually implement activated programmes.
- Three: rigorous in-house or external-independent evaluation of the programme; generally evaluation is outsourced to independent institutions in case of major programmes.
- Four: if evaluation is positive, gradual expansion of the programme, and parallel advocacy in order to involve either the government or a bigger foundation through further funding or taking over.
For the purpose of this work, the most interesting programmes are the following:

**Summer Schools**

*Content and goal*

The week long summer schools are designed to give bright students from non-privileged households a taste of life at a leading university. Actually, during vacation period, students spend a week at the university, in close contact with academics, and are involved in subject specific activities – i.e. attending lectures, visiting scientific institutions, receiving tutorials, help to make good university applications, ect…

The aim is to demystify elite universities and to equip students – most of whom will be the first in their families to go on to higher education – with the knowledge and insight to make high quality applications to prestigious universities.

*Target group and selection*

The target group is thus represented by smart students at stage 12 – that is after 16 years of age – presumably on the track to university, that run the risk of not continuing education because of their underprivileged conditions.

The criteria for selecting students are set by the Trust. Universities have some discretion in choosing who they want, but this procedure is judged every year by Sutton in order to check that criteria are actually respected.

Criteria for selection are: students from schools at lower level of achievement, students from non graduate background, students eligible for education maintenance allowance. These criteria are matched with indicators of students performance. More precisely, criteria employed in 2009 were the following:

- High levels of academic achievement at GCSE
- From non-professional backgrounds
- Parents did not study at university
- In receipt of Education Maintenance Allowance (and so were from homes with incomes of less than £30,000 a year)
- Who were studying in schools and colleges with below average levelsof performance

*Figures*

The Sutton has been running summer schools for 13 years, with the number of applications reaching the peak level of almost 4,400 in 2009, up by nearly 30 percent on the previous year. Also the number of places available is increasing, reaching 900 in 2009. The attempt is also to reach schools which rarely send students on the programme, as this is where aspirations towards the elite universities are likely to be particularly low and where advice on how to negotiate admissions arrangements is particularly needed.

The cost of the programme is about 500 Pounds (ca. 580 Euros) per student, of which the Trust pays a half.

*Funding and implementation*

Summer schools are funded by the Sutton Trust with the support of its partners and host universities. Currently, involved university are the following: Bristol, Nottingham, Cambridge, St. Andrews, Oxford.

More in details, the Sutton Trust provides half of funding for travel, accommodation and staff expenses, while the rest comes from hosting universities.

The Sutton is in charge of the administration of the programme, including promotional activities (see below), centralized application process, definition of criteria for students selection.

*Promotion*

The programme is mainly promoted via the distribution of brochures and leaflets in all the schools of the country. However, a major promotional vehicle is represented by the web, and students may apply directly on line.

*Evaluation*

Evaluation reports provide evidences of the effectiveness of the programme in reaching underprivileged students. Also research from UCAS continues to show that the summer schools are effective in raising the aspirations of young people and supporting them on a route to a highly-selective university course.

Data on the 2007 cohort (who started university in the Autumn of 2009) shows that Sutton Trust students were three times as likely to apply to one of the five summer school universities as applicants from the comparator group of students from similar backgrounds and with similar levels of attainment. Furthermore, all other things being equal, students taking part in the summer school programme have greater chances of getting a place at the same university where they completed the summer school. Significantly, 6 in 10 students have begun their degrees at one of the elite Russell Group universities, and one quarter ended up at one of the five host summer school universities.

Also, the *Ten Year Review of Sutton Trust Summer Schools* published in 2008, reports that

"a series of interviews with past students identified the following benefits from attending summer schools:

- Applications support: Summer schools helped students to decide which university and which subject to study, often changing intentions over which degree courses to apply to.

- Admissions support: Summer schools provide practical guidance, helping preparation for interviews and some specialist entrance examinations for example.

- Academic preparation: Experiencing university-style teaching and learning and aiding preparations for the transition from A-level to university are among the academic benefits cited by participants.

- Social benefits: Social benefits of attending summer schools should not be underestimated. These include: meeting like minded people, developing social skills and confidence and meeting academic staff.
- Extracurricular activities at university: One aspect of the longer term benefits of the summer schools was a commitment among many participants to 'give something back' later on when they had become university students. Helping out at summer schools when at university was one way of achieving this.
- Progression beyond university degrees: Another possible outcome of the social commitment demonstrated by summer school students later on was a higher likelihood to study at postgraduate level and go into teaching than other students."

## Reach for Excellence

*Content and goal*

This is another initiative aimed at favoring access to university for non-privileged young people who have the potential to attend research-led universities. More in details, it is a 2-year "sustain programme", as students are picked up from the end of year 11 - that is at the completion of compulsory schooling - and followed all the way through their application to university.

Students are followed by the "Access department" of the University of Leeds, and they are offered revision days, trips to university, and other activities in order to raise their aspirations and provide them with better guidance towards university.

*Target group and selection*

The participants are from schools and colleges with low higher-education participation rates in the area around the university of Leeds. The students receive a comprehensive package of guidance throughout their sixth form studies – that is between age 16 and 18 - including subject taster sessions, study skills workshops, impartial pre-entry guidance, financial literacy sessions, e-mentoring and a residential summer school. All of these elements are designed to raise aspirations, boost confidence, and provide accurate and realistic guidance.

With respect to the target group of the summer schools programmes, these students are slightly more disadvantaged and slightly less high achieving, and thus in need for more support.

*Figures*

Roughly 100- 150 students are involved in the programme each year.

*Funding and implementation*

It is funded by the Sutton Trust in partnership with Halifax, and run in partnership with the University of Leeds, which is one of the institutions included in the "Russell group". Sutton has funded for cohorts of students involved in the programme thus far.

*Promotion*
Information about the programme are mainly circulated through the web and students may also apply on line.

*Evaluation*
As with all major Sutton Trust projects, the impact of Reach for Excellence is being rigorously assessed. The National Foundation for Educational Research (NFER) is conducting an evaluation of the programme over five years using a control group of young people from similar backgrounds and abilities. The first results of the research shows that the programme is successfully reaching those it is designed to help, with 86 percent being first generation university applicants and 85 percent gaining between nine and 18 GCSEs graded A* to C. Crucially the analysis underlines the difference Reach for Excellence is making to young people, with students on the programme being twice as likely as similar students in the comparison group to enter a research-led university.

Table A8. Destinations of students from the first RfE cohort compared with students from the                control group

| Destination | Numbers | | Percentages | |
|---|---|---|---|---|
| | RfE n=78 | Control n=110 | RfE | Control |
| University | 68 | 72 | *87* | *65* |
| Research intensive university* | 35 | 23 | *45* | *21* |
| Gap year/gap year then university | 7 | 11 | *9* | *10* |
| Other (college, school, job, apprenticeship) | 2 | 18 | *3* | *16* |
| Employment | 1 | 9 | *1* | *8* |

*Respondents fall into more than one category so percentages do not sum to 100.*
*\* refers to Russell group or 1994 Group universities*

*Source: ST, The Reach for Excellence Programme: a summary and discussion of findings from the first cohort of students.*

Also, the report analyzes the link between inclusion in the programme and academic attainment. "As the table below shows, proportionally, RfE students achieved significantly more A and B grades than the control students. Seventy-two percent of A-level grades among RfE students were As or Bs compared with 55% for the control students. Sixty-one percent of the RfE students achieved at least one A grade, compared with 38% of the control group.

Table A9. Percentage of A to U grades as a proportion of all grades achieved

| Grade | Percentage | |
|---|---|---|
| | RfE (total number of grades n=267) | Control (total number of grades n=375) |
| A | 43 | 22 |
| B | 29 | 33 |
| C | 16 | 23 |
| D | 9 | 11 |
| E | 1.5 | 8 |
| U | 1.5 | 2 |

Due to rounding, percentages may not sum to 100.
*Source: NFER Grades Data, 2009.*

It is difficult to make any claims as to the role of RfE in the achievement levels of the students. However, NFER conclude that it is likely that the RfE programme has encouraged students to reach their full potential and to strive to get high grades – and, indeed, the programme includes sessions, such as study skills events, which are intended to help performance in exams. The evaluation of cohort two (due to report in December 2010) will provide a more detailed overview of achievement levels, drawing on both predicted and actual achievement levels at an individual student level." (ST, *The Reach for Excellence Programme: a summary and discussion of findings from the first cohort of students,* pp. 9-10).

**Private Tuition Pilot**

*Content and goal*

This programme is a good example of actions directed not at rewarding talented students, but at fostering the growth of best performing students. It will be first launched as a pilot programme for 1 year in spring 2011.

It originates from the recognition of the growing relevance of private tuition in England, with almost a quarter of students across the country (43% in London) receiving such help at some point during their school careers. The Sutton Trust's concern is that this trend will widen still further the achievement gap between the haves and the have nots, with those families who can pay for private tuition extending their academic lead over those from poorer homes.

The pilot project then offers a 10 hours of support in the form of private tuition in mathematics, either one-to-one or in pairs in the run-up to the GCSE exam.

*Target group and selection progress*

Academically able Year 11 (GCSE) pupils from non-privileged homes, who would not otherwise be able to afford private tuition. The aim is to help those students with the potential to achieve A or A* grades in their maths GCSE, but who are at risk of not doing so because of economic conditions.

The selection process in this case is more complex. First, a number of schools are selected on the basis of the number of disadvantaged intakes, then teachers are asked to nominate some students that have the potential for getting A grades but there is evidence that they are leaning towards B. Then students are involved in the programme and randomly divided into two groups for later controlling and evaluating, a hard but necessary practice for empirically grounded and evidence based programmes.

*Figures*

Around 100-150 students will be selected for the first year of experimentation.

*Funding and Implementation*

Jointly with private tuition company. The cost of the whole programme, including evaluation, will be around 50.000 Pounds (ca. 60.000 Euros).

*Evaluation*

If independent evaluation provides evidence that private tuition is effective, the Trust will try to involve either the government or a bigger foundation in order to expand the programme.

In the past, the Trust also funded

**Teachers Summer Schools**

The programme had basically two aims. First, giving teachers more expertise for more valuable teaching; second, overcoming a major problem in the UK, namely teachers discouraging bright but poor students from applying to top universities.

The structure of the programme was similar to the Students Summer Schools, as teachers used to spend a week at the university, learning both about their subjects and how to motivate students to continuing education.

The major difficulty encountered in the implementation of the programme was represented by the fact that teachers had to be involved in work related activities during their holiday periods.

The programme is currently continued by Oxford University by itself.

# UNITED STATES

## BILL & MELINDA GATES FOUNDATION

**The** Bill & Melinda Gates Foundation is one of the largest private foundation in the world, founded by Bill and Melinda Gates. The foundation is "driven by the interests and passions of the Gates family". The primary aims of the foundation are, globally, to enhance healthcare and reduce extreme poverty, and in America, to expand educational opportunities and access to information technology. The foundation, based in Seattle, Washington, is controlled by its three trustees: Bill Gates, Melinda Gates and Warren Buffett.

To maintain its status as a charitable foundation, it must donate at least 5% of its assets each year. Thus the donations from the foundation each year would amount to over US$1.5 billion at a minimum.

The foundation supports grantees in all 50 states and the District of Columbia. Internationally, it supports work in more than 100 countries.

Main figures:
Number of employees: approximately 874
Asset trust endowment: approximately  $34 billion
Total grant commitments since inception: $23.91 billion [1]
Total 2009 grant payments: $3.0 billion

*Structure*

The Foundation has been organized, as of April 2006, into three grant-making programs:
  • Global Health Program
  • Global Development Program
  • United States Program.
For the purposes of this report, of interest is the third one. The United State program is based on the belief that when all people in the United States have the opportunity to develop their talents, the society thrives. The mission of the foundation is then to help ensure greater opportunity for all Americans through the attainment of secondary and postsecondary education with genuine economic value.
The Foundation works with a number of partners in order to improve public education, focusing on the following priority areas:

- Education: it works to make sure high school students graduate ready for success and prepared to earn postsecondary degrees. It funds college and graduate school scholarships and supports high-quality early learning programs in Washington state.
- Libraries: it supports efforts to supply and sustain free public access to computers and the Internet through local public libraries.
- Pacific Northwest: it assists struggling families by supporting innovative community organizations located in the Pacific Northwest and efforts that help break the cycle of homelessness.
- Special Initiatives: it explores new ways to increase opportunities or respond to unique challenges in the United States. These currently include grants that support Postsecondary Education and Emergency Relief efforts. It also offers support to many dedicated and innovative community organizations in the Pacific Northwest.

The Foundation also uses advocacy to raise awareness of the issues, inform government policy, and develop new and innovative ways of financing initiatives that improve outcomes.

*Lines of activity*

As regards the education field, the Bill and Melinda Gates Foundation works with a number of public and private partners to increase high school graduation and college-readiness rates in the United States. More in depth, the Foundation has four main lines of activity:

*- Improve high school education nationwide.*
"High-quality schools can take many forms, but they share common elements. All have strong leadership, effective instruction, rigorous curricula, the systematic use of data to improve the classroom experience, and broad support to help all students achieve. Our efforts in high school reform date back to 2000. We continue to adapt and refine our strategies to raise the expectations and achievement of all students nationwide."

*- Enhance teaching and learning in classrooms by working closely with states and districts.*
"We're supporting public-private partnerships with school districts and state governments committed to comprehensive school improvement. No school exists in a vacuum and, with a supportive environment, more schools can improve more quickly. Stories of successful district-wide and statewide reform inspire others to join in the effort to improve high schools."

*- Encourage commitments to common state standards and goals nationwide.*
"We're working to ensure that schools and government define and measure graduation and college-readiness rates in similar ways. For example, for many years there has been no universal way to count students who drop out and those who graduate. To set goals

and measure progress accurately, education stakeholders need to use a common language and arithmetic. We also support efforts to develop common state standards so that students in Massachusetts will learn the same key skills as students in Mississippi."

*- Increase public and political support for improving high school education.*
"For high schools to succeed, communities must support their efforts to improve. We've observed how bold leaders - at the federal, state, and district level - can use policy to align reform efforts and produce real improvement in student achievement. We're supporting efforts to educate people about the problems facing our schools and help them find ways to help fix them. We remain optimistic that our nation can meet the challenge of preparing all high school students to succeed in high school and beyond."

With reference to the specific focus of this report, of particular interest seems to be actions taken in the following programs:

- *Empowering effective teachers;*
- *Gates millennium scholars.*

Of interest are also two external projects co-sponsored by the Bill and Melinda Gates Foundation:

- *KIPP – knowledge is power project;*
- *Roads to success.*

## Empowering effective teachers

*Overview of the program:*
Evidence shows clearly what most people know intuitively: teachers matter more to student learning than anything else inside a school. But they need support to help students succeed, and they deserve recognition and rewards for doing a great job. The Bill & Melinda Gates Foundation is investing $290 million in four communities across the country to support bold and ambitious plans that will transform how teachers are recruited, developed, rewarded, and retained. The large and mid-size urban school systems that will benefit from these grants currently serve more than 350,000 students, many of them from underserved communities.

*Content and goals:*
In the four selected Intensive Partnership sites, district and school leaders will implement bold reform plans over the next several years to better recruit, retain, and reward effective teachers and ensure that the highest need students are taught by the

most effective teachers. While the individual plans vary, they include elements such as creating career ladders so teachers can advance while remaining in classrooms; boosting teacher development, training, and support; and tying results and tenure decisions more closely to student achievement. Each partner is working in close collaboration with its local teachers union and other community organizations to implement its plans.

Ultimately, these communities seek to dramatically increase the number of effective teachers serving all students, boost student achievement, and nearly double the number of students who graduate ready for college. The research and strategies developed through this work are intended to provide policymakers and educators across the country with evidence-based tools and information to help improve education for all students.

*Target group and selection:*

The announcement of the Intensive Partnership grants culminated a year-long competitive application process that brought together school district, school board and local teacher union leadership to develop comprehensive and innovative reform plans. Each of the four selected communities demonstrated a broad-based commitment to raising student achievement. They also represent a mix of large and mid-size urban school systems with diverse populations.

*Figures:*

The Foundation has invested $290 million for four communities:

- Hillsborough County Public Schools (Tampa, Fla.), $100 million
- Memphis City Schools, $90 million
- Pittsburgh Public Schools, $40 million
- The College-Ready Promise (five charter school networks in Los Angeles: Alliance College-Ready Public Schools, Aspire Public Schools, Green Dot Public Schools, Inner City Education Foundation, and Partnerships to Uplift Communities Schools), $60 million

In the next pages two reform plans are reported more in depth: the Memphis City Schools (Box A1) and the Pittsburgh Public Schools (Box A2).

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*Box A1. Empowering effective teachers in Memphis City Schools*

Background

The Memphis City Schools System has seen some tremendous successes over the past year; however, there is clearly much work to be done – especially with regards to how we think about our teachers. As The New Teacher Project's recent report suggests, we (like many districts) largely operate as if one teacher is as good for students as another.

This is evidenced in, and driven by, our lack of a common definition of "effective teaching." We lack an informative teacher evaluation process, and we pass by many potentially crucial human capital decisions. We fail to recognize and reward excellence, and we do not respond appropriately to teachers who may need assistance. From our least effective teachers to our very best – all are provided the same professional development opportunities, and all are compensated on the same longevity and degree-based scale. All of this will change with the implementation of the Memphis City Schools' innovative Teachers Effectiveness Initiative (TEI). Developed by the MCS under the direction of Superintendent Dr. Kriner Cash, with deep collaboration with the MCS Board of Commissioners and the Memphis Education Association, the TEI is focused on what matters most for our students: their teachers. Effective teachers have always been essential to students' success – and never more so than today, with higher state standards and an increasingly competitive global economy. The TEI will deepen and accelerate our existing aggressive reform agenda. It will provide the additional fuel necessary to drive dramatically improved student achievement. While many poor and minority youth achieve at the very highest academic levels, the achievement gap – and its impact – is real. This gap (currently narrowing much too slowly) must be closed. Of course, this achievement gap is a matter of access and experience – not ability. Many of our students are fortunate to have terrific teachers. But the TEI will help ensure that every child is taught by an effective teacher every day, every year. With such access to high quality-learning experiences, our students' lives will be changed and our city will be transformed.

TEI Strategy and Key Components

MCS is committed to dramatically boosting student achievement and college-ready graduation rates through the following actions: Creating a common, agreed-upon process to define and measure effective teaching. The new Teacher Effectiveness Measure (TEM) will include multiple factors, including: growth in student learning; observation of teachers' practices; perceptions of students, parents, and colleagues; and teacher knowledge in their subject area.

Increasing the number of effective teachers through:

• Enhance strategic Human Resources capacity by expanding the existing partnership with The New Teacher Project to handle all teacher recruitment and staffing services; Increase the pipeline of teacher candidates through better coordination with partners, including Teach for America, Memphis Teacher Residency, and Memphis    Teaching Fellows.

• Raise the bar for tenure so that it is based on the TEM and link it to significant increases in compensation and roles/responsibilities.

• Boost the retention of effective teachers, particularly early in their careers, through performance-based retention incentives.

• Increase the turnover of the most ineffective teachers.

• Improve the teacher evaluation process based on the TEM.
• Connect professional development opportunities to individual need, based on more frequent observation and feedback.
• Create new and differentiated career paths that promote teachers to increasing levels of influence (e.g. Beginning Teacher, Professional Teacher, Master Teacher).
• Give teachers greater rewards for differentiated roles and performance.
• Strategically place Master Teachers in the schools and classrooms where they are needed most. Improving school culture and environments to foster effective teaching and learning.
• Provide additional training and support to principals, assistant principals, and aspiring principals through the newly formed MCS Urban Education Center and continue to partner with New Leaders for New Schools to target high-quality principal recruits.
• Engage external support for training teachers and principals on developing positive and productive school climates.
• Develop a new technology platform to support data-driven decision-making in order to improve teacher effectiveness.

TEI Funding and Support

On November 19, 2009, the Memphis City Schools was officially awarded a $90 million, six-and-a-half-year grant from the Bill & Melinda Gates Foundation to help fund and support the development and implementation of the Teacher Effectiveness Initiative. Memphis is one of only four school systems in the United States to receive the grant; the others are Hillsborough County, FL; Pittsburgh, PA; and the Los Angeles Charter School Management Corp. The "Intensive Partnership" grant that Memphis received from the Gates Foundation was based on the strength of the proposal that was submitted by Memphis City Schools' leadership, the foundation's confidence in the MCS' ability to develop and executive a highly effective plan, and the enormous potential that exists within our school district. The Gates Foundation grant will be supplemented by a local match of $3.07 million per year, over six and a half years, which will be raised from private funders. The Memphis City Schools Foundation is responsible for raising local funds for this endeavor. The foundation is comprised of corporate and philanthropic leaders, including Kim Wirth, International Paper; William Mitchell, Crye-Leike; Diane Terrell, FedEx; Lisa Wheeler, Valero; and Ken Foster, Memphis Education Association.

Measures of Effective Teaching (MET) Research Project

In addition to the awarding Memphis City Schools an Intensive Partnership grant, the Bill and Melinda Gates Foundation has asked MCS to participate in a two-year research project known as The Measures of Effective Teaching (MET). This project will be led by Dr. Tom Kane, Deputy Director of Research and Data for the Gates Foundation and professor of education and economics at Harvard University. The MET project will study multiple measures of teacher effectiveness, including videotaped classroom

observations, student surveys and other test and non-test based data and compare them to nationally recognized teaching standards. This data will help determine ways in which effective teaching can be measured fairly and consistently. MCS and the Memphis Education Association will collaborate with the Gates Foundation's research team to study measures of teacher effectiveness that are fair and valid. Results from the MET will support the work of the larger Teacher Effectiveness Initiative (TEI) project by providing evidence about what multiple measures say about the essential elements of effective teaching. Up to 1,000 MCS teachers in reading/language arts and mathematics in grades 4-8, and selected high school subjects, Algebra I, Biology, and English 9, will voluntarily participate in the two-year MET project.

For further details see *The Teacher Effectiveness Initiative - July 2010 Empowering teachers for student success*
 (http://www.mcsk12.net/tei/docs/2010TEI_Case_Study%5BAug%5D.pdf)

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*Box A2. Empowering effective Teachers in Pittsburgh Public Schools*

In Pittsburgh, we dream big, work hard, and know exactly what we must accomplish in our schools. *We commit that with robust, enduring district support and mutual accountability, Pittsburgh's teachers will be empowered as effective leaders to do whatever it takes to foster a culture of striving, resilience, and college-readiness so that over 80 percent of all students complete a post-secondary degree or workforce certification.*

This vision is bold, but realistic because we come to this work from a position of strength:
• With $135M in commitments to *The Pittsburgh Promise*, our community has eliminated money as an obstacle to higher education for at least a generation of students. Our students have embraced this opportunity. In 2008, its first year, 757 graduates or 67% of eligible students earned *Promise* scholarships.1 We utilize *The Promise* to infuse college-readiness in all that we do. It strengthens community and family partnerships and offers an unprecedented opportunity to understand and measure post-secondary success.
• Through a collaborative, trust-based relationship with the Pittsburgh Federation of Teachers (PFT), the district has addressed issues such as curriculum design, innovative staffing for new schools, and teacher evaluation. We have now built the mutual respect necessary to tackle difficult issues, such as differentiated compensation, our learning environment, and tenure reform. Our ability to agree on systemic change within a collective bargaining context lends credibility to American Federation of Teachers

(AFT) member's belief that constructive change will come from working with teachers, not "doing to" teachers.

• For the past three years, the district has improved student achievement through the deliberate sequencing of strategies outlined in the *Excellence for All* reform agenda, including designing and implementing a rigorous new PreK-12 core curriculum, expanding and improving professional development, strengthening early childhood offerings, and using data to improve student learning. A deliberate fi rst step was to focus on improving school leadership. With support from the Broad Foundation and the Teacher Incentive Fund (TIF), we developed and implemented a comprehensive accountability system to recruit, train, support, evaluate, improve, and compensate principals through performance-based pay.

• We are addressing the disproportionately low achievement levels among our African American students. We settled a 15 year-old lawsuit brought by the Advocates for African American Students, established an Equity Advisory panel that represents the community's voice, created Accelerated Learning Academies (ALAs), implemented a high-level course in African American history, and are ensuring a culturally inclusive curriculum.

• District governance and management have worked hard and made tough decisions. We closed 25% of the district's schools in 2006, which resulted in annual savings of $14.7M and restored the confidence of state and community leaders. All told, the Board has supported $48M in budget reductions over three years. Our fiscal discipline allows us to use our $30M in federal stimulus funding for several targeted programs to improve middle grades literacy skills, rather than plugging financial holes.

Many individual urban schools in Pittsburgh and across the nation succeed in educating a vast majority of their students to a high level, but no school system has been able to do so. It is extraordinarily challenging to bring all the necessary pieces together to meet the needs of an urban student population where children come from disparate and often diffi cult environments.

For students are impacted by so many factors: their teachers, principals, their learning environment, curriculum, the degree to which they develop positive study habits (e.g. homework), as well as their personal hopes, dreams and aspirations.

Although we have accomplished a great deal, we realize that we do not have all the pieces in place that contribute to student success. Research shows that of the school-based factors, the quality of teaching has the most significant impact on student growth. Support from the Bill & Melinda Gates Foundation (BMGF) on maximizing teacher effectiveness will enable us to bring that most profound influencer to bear on behalf of our students, and, coupled with the critical work we have already accomplished, bring the necessary pieces together in a manner that has not been seen in an urban setting.

In sum, we believe that the core academic elements we have in place, our management capacity, manageable size, fiscal and governance stability, local and national union support, as well as track record of funding success and stakeholder support—together

with *The Pittsburgh Promise*— offer a unique opportunity for the BMGF to prove that with the right conditions of support, effective teachers can move a vast majority of urban students to achievement levels that lead to college success or workforce certification.

This proposal outlines the next steps that will ensure high achievement for all of our students.

While implementing these initiatives will be challenging, they are essential for student success, and, with support from BMGF, our community, families, teachers, and principals, we are confident in our ability to realize these changes.

*The Pittsburgh Public Schools' (PPS) Strategic Vision*
We will focus our ongoing district reform efforts on our vision for teacher effectiveness: *Pittsburgh's teachers will be empowered as effective leaders to do whatever it takes to foster a culture of striving, resilience, and college-readiness so that over 80 percent of all students complete a post-secondary degree or workforce certification.*
Working with the PFT, we have identified three strategic priorities, supported by a combination of initiatives, that will improve student outcomes from 29% college-ready today to 50% college-ready in five years, and 80% in 11 years.2 The three strategic priorities are: 1) increase the number of highly effective teachers; 2) increase the exposure of high-need students to highly effective teachers; 3) and ensure all teachers work in learning environments that support their ability to be highly effective.

*Increase the number of highly effective teachers.*
We will enhance, recognize and reward the effective teachers in our classrooms, improve the effectiveness of the teachers we hire, and systematically exit those teachers who do not materially improve student learning. *Enhance, recognize, and reward the effectiveness of teachers already at PPS.* Building teachers' effectiveness requires identifying how teachers are performing and linking that to professional development. Until now, a binary evaluation tool and weak evaluation process limited our ability to tailor professional development to teachers' individual needs. In December 2008, we began to address these concerns, working collaboratively with the PFT to co-construct the Research-Based Inclusive System of Evaluation (RISE).
RISE defines effective teaching and prescribes an evaluation process. We will pilot RISE in half of our schools this fall. A second initiative to build the effectiveness of current teachers is the PPS/PFT Promise Academy (the Academy).
The district and the PFT have addressed performance pay and agreed that it would be salutary to have a teacher compensation plan that rewards teachers who effect growth in student achievement. To that end, the district and the PFT have agreed to work collaboratively, involving the AFT in the effort, to develop a Value-Added Measure (VAM) to anchor such a plan. Simultaneous with the development of a VAM, the

parties commit themselves to developing a valid and equitable compensation plan structure and achieving its implementation through the collective bargaining process.

*Improve the effectiveness of the teachers we hire.*

Through *Teach For Pittsburgh*, we will infuse our beliefs about the skills, mindsets and values necessary to teach in Pittsburgh.

This will be reflected in the hiring practices we use to select the very best candidates—including our willingness to hire high-capacity non-certifi ed candidates in Mathematics, Science, and Special Education—and the practices we employ in our 13-month residency-based induction process at the Academy. Additionally, we will place a particular emphasis on ensuring that the award of tenure is a milestone in a teacher's career and represents proven effectiveness, including evidence of moving student achievement.

*Exit teachers who do not materially improve students' learning.*

Today, we do not systematically identify and exit ineffective teachers. We are prepared to address this need.

*Increase the exposure of high-need students to highly effective teachers.*

We will offer highly effective teachers new, high-impact roles that recognize and reward the importance of teaching high-need students.

Through RISE and the development of a VAM, we will learn which teachers are highly effective. We will target these teachers for high-impact roles linked to increased compensation.

One example of these roles is a 9th and 10th grade Excellence Corps, a group of highly effective teachers collectively responsible for student growth over the course of two years. Our teachers will follow students from 9th to 10th grade and receive rewards and recognition linked to student outcomes, thus building ownership for shepherding students through to high school graduation and access to *The Pittsburgh Promise*.

*Ensure all teachers work in learning environments that support their ability to be highly effective.*

To ensure our students' access to *The Pittsburgh Promise*, we will set and reinforce high standards for behavior and aspirations, build students' ability to meet those standards, and provide wrap-around supports to address escalated needs (e.g., social services, "Be a 6th

Grade Mentor" project, assistance for children with special needs). Recognizing that self-discipline and work habits are necessary for post-secondary success, we need system-wide supports to establish and maintain a strong learning environment in every school.

*Implementation and Results*

Over the next five years, we will sequence the strategic initiatives outlined above to ensure that the district has the capacity to manage these changes.

Phase I (2009-10): Lay the foundation. We will pilot RISE, as well as build capacity in both central office and schools, define metrics and develop phased implementation plans for initiatives that launch in Phases II and III. Collaborative development of a VAM begins. Performance pay system is constructed and presented to PFT membership for ratification. Phase II (2010-12): Build momentum. We will expand RISE to all schools, launch career ladder roles, and welcome the Academy's first two classes. We will also build the awareness of, and support for, our teacher effectiveness strategies and the impact they have on student achievement.

Phase III (2012-14): Based on data collected in prior years, we will refine our initiatives. We will also bring all of the Phase II initiatives with demonstrated impact to scale. Since they still struggle, we will prioritize high schools in our sequencing, especially 9th and 10th grades, in order to make the dramatic changes that will foster *Promise-Readiness*, build positive learning environments, and ensure the personalized approach necessary for student success.

Table A10 reports expected teachers and students gains in the three main phases.

Table A10. Expected teachers and students gains in the three phases

| Expected teacher and student gains | Baseline | Phase I | Phase II | Phase III |
|---|---|---|---|---|
| Highly effective teachers | 28% | 30% | 36% | 41% |
| Students achieving college-readiness | 29% | 34% | 41% | 50% |
| Grades K-5 | 34% | 38% | 45% | 53% |
| Grades 6-8 | 30% | 33% | 40% | 49% |
| Grades 9-12 | 22% | 28% | 36% | 46% |
| PPS high school graduation rate | 65% | 68% | 71% | 76% |

*Organizational Capacity and Partnerships*
To implement the initiatives outlined above, we must enhance our internal capabilities. Most critical to our success are the following three functions:
• *Human Resources.* We will transform our Human Resources department into a strategic asset. To build capacity, we will partner with Dr. Betsy Arons and The New Teacher Project (TNTP).
• *Information Technology.* We must build IT systems to support the use of real-time data to
inform day-to-day management, as well as periodic evaluation of this work.

• *Research & Evaluation.* To deliver the rigorous evaluation we believe this work demands,
we plan to partner with Mathematica Policy Research (MPR) and the AFT.

*Capturing Lessons Learned and Evaluation*
Selection as an intensive partnership site carries a responsibility to pursue rigorous evaluation.
We are committed to advancing the state of research in education, as well as our own under standing of what drives impact. This demands the selection and use of performance metrics. We have already begun this work.

*Project Budget*
The cost of our initiatives is $85M over five years. We request $50M from BMGF, which will greatly accelerate our teacher effectiveness work. To cover the difference between the total cost of these initiatives and what we are requesting from BMGF, we plan to:
• *Seek external funding.* We will seek more than $35M from Race to the Top, the Teacher Incentive Fund, the What Works Innovation Fund (WWIF), and our local Fund for Excellence to help fund career ladders, the Academy, and learning environment initiatives, IT investments and impact evaluation.
• *Reallocate internal costs.* By 2014, we will have identified as much as $19-33M a year to sustain our teacher effectiveness strategies. These savings will come from closing underutilized facilities, changing our teacher distribution, and improving operating effi ciencies.

*Challenges and Risks*
We recognize that we must overcome several risks and challenges, including:
• *Failure to ratify initiatives related to collective bargaining measures.* Although PPS and PFT leadership support the initiatives contained in this proposal, the PFT membership will be the final voice on collective bargaining issues. We understand the importance of a comprehensive and well executed plan; therefore, we have budgeted a PPS/PFT resource for communications and implementation related to these topics.
• *Change-management and execution risk.* We will manage the execution risk involved in a project of this scale through the thoughtful and deliberate sequencing of initiatives and oversight from the proposed Office of Teacher Effectiveness (OTE).
• *Human Resources (HR) and Information Technology (IT) capacity.* Delays in transforming these departments could impact other aspects of this proposal. The OTE will work to ensure fidelity of implementation.
• *Funding in light of poor economy.* We may be forced to spend portions of the internal cost savings to cover budgetary gaps. We will manage this risk by carefully examining

district budgets to protect cost savings, including postponing other projects, and will seek additional funding for the initiatives described here.

*Sustainability*
The strategies outlined above have been sequenced so that up-front investments will be complete by 2014. Since the district also plans to undertake a series of cost-effectiveness measures, we are confident that we can build any ongoing costs into our existing budget projections after 2014.

*Conclusion*
Pittsburgh was not built by small thinkers — it was built by people who dreamed big and worked hard. As we educate a workforce that can compete in an economy driven by computers rather than steel mills, we are aware that many believe we are swimming against a powerful tide — they argue that a public school district cannot be reformed from within, and that a teachers' union will never embrace changes that create the right environment for dramatic growth in student learning.
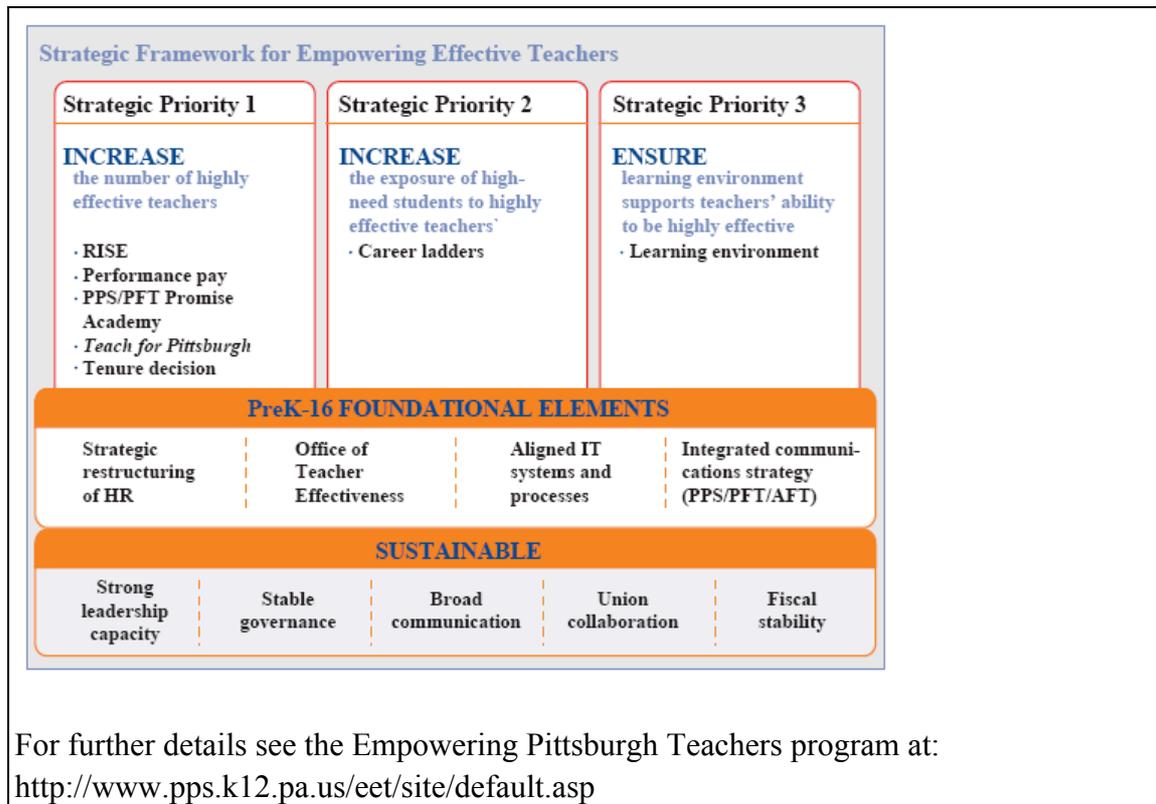
*We will prove them wrong.*
When we announced *The Pittsburgh Promise* there were more skeptics than believers— we had no money in the bank and no commitments. The first contribution to *The Pittsburgh Promise* came from our partners at the PFT. Although modest, the commitment and its significance were clear.
Two years later, in the most difficult fundraising climate in a generation, *The Promise* is a reality, as a $100M challenge grant from the region's largest employer, the University of Pittsburgh Medical Center (UPMC), has been matched by $35M in gifts from area foundations and businesses— several are among the largest grants in these foundations' histories.
Our community has bet on our ability to dramatically increase the number of our students who are *Promise-Ready*. We embrace the challenge and pledge to the students and families we are privileged to serve, the Pittsburgh community, and BMGF that we will do whatever it takes to achieve our vision that 80% of our students complete a post-secondary degree or workforce certification. The figure below (Fig. A4) provides an illustration of the PPS strategic framework for empowering effective teachers.

FigureA4. PPS' Strategic framework for empowering effective teachers

**Strategic Framework for Empowering Effective Teachers**

| Strategic Priority 1 | Strategic Priority 2 | Strategic Priority 3 |
|---|---|---|
| **INCREASE** the number of highly effective teachers | **INCREASE** the exposure of high-need students to highly effective teachers` | **ENSURE** learning environment supports teachers' ability to be highly effective |
| · RISE<br>· Performance pay<br>· PPS/PFT Promise Academy<br>· *Teach for Pittsburgh*<br>· Tenure decision | · Career ladders | · Learning environment |

**PreK-16 FOUNDATIONAL ELEMENTS**

| Strategic restructuring of HR | Office of Teacher Effectiveness | Aligned IT systems and processes | Integrated communications strategy (PPS/PFT/AFT) |
|---|---|---|---|

**SUSTAINABLE**

| Strong leadership capacity | Stable governance | Broad communication | Union collaboration | Fiscal stability |
|---|---|---|---|---|

For further details see the Empowering Pittsburgh Teachers program at:
http://www.pps.k12.pa.us/eet/site/default.asp

In addition, as part of its plan to promote and support effective teaching, the Bill and Melinda Gates Foundation is supporting a two-years (2009-2011) research to better understand and define what makes a teacher effective and to identify multiple measures of effectiveness on which teachers, researchers, and policymakers can all agree (Box A3).

*Box A3. The Measure of Effective Teaching research project*

*Learning about Teaching - Initial Findings from the Measures of Effective Teaching Project*
(http://www.gatesfoundation.org/college-ready-education/Documents/preliminary-findings-research-paper.pdf)

In fall 2009, the Bill & Melinda Gates Foundation launched the Measures of Effective Teaching (MET) project to test new approaches to measuring effective teaching. The goal of the MET project is to improve the quality of information about teaching effectiveness available to education professionals within states and districts—information that will help them build fair and reliable systems for measuring teacher effectiveness that can be used for a variety of purposes, including feedback, development, and continuous improvement. The project includes nearly 3000 teachers who volunteered to help us identify a better approach to teacher development and evaluation, located in six predominantly urban school districts across the country: Charlotte-Mecklenburg Schools, Dallas Independent School District, Denver Public Schools, Hillsborough County Public Schools (including Tampa, Florida), Memphis City Schools, and the New York City Department of Education. As part of the project, multiple data sources are being collected and analyzed over two school years, including student achievement gains on state assessments and supplemental assessments designed to assess higher-order conceptual understanding; classroom observations and teacher reflections on their practice; assessments of teachers' pedagogical content knowledge; student perceptions of the classroom instructional environment; and teachers' perceptions of working conditions and instructional support at their schools.

Introduction
For four decades, educational researchers have confirmed what many parents know: children's academic progress depends heavily on the talent and skills of the teacher leading their classroom. Although parents may fret over their choice of school, research suggests that their child's teacher assignment in that school matters a lot more.And yet, in most public school districts, individual teachers receive little feedback on the work they do. Almost everywhere, teacher evaluation is a perfunctory exercise. In too many schools principals go through the motions of visiting classrooms, checklist in hand. In the end, virtually all teachers receive the same "satisfactory", rating 1.
The costs of this neglect are enormous. Novice teachers' skills plateau far too early without the feedback they need to grow. Likewise, there are too few opportunities for experienced teachers to share their practice and strengthen the profession. Finally, principals are forced to make the most important decision we ask of them—granting tenure to beginning teachers still early in their careers—with little objective information

to guide them. If we say "teachers matter" (and the research clearly says they do!), why do we pay so little attention to the work they do in the classroom? If teachers are producing dramatically different results, why don't we provide them with that feedback and trust them to respond to it? Resolving the contradiction will require new tools for gaining insight into teachers' practice, new ways to diagnose their strengths and weaknesses and new approaches to developing teachers. In the Fall of 2009, the Bill & Melinda Gates Foundation launched the Measures of Effective Teaching (MET) project to test new approaches to identifying effective teaching. The goal of the project is to improve the quality of information about teaching effectiveness, to help build fair and reliable systems for teacher observation and feedback.

OUR PARTNERS

Although funded by the Bill & Melinda Gates Foundation, the MET project is led by more than a dozen organizations, including academic institutions (Dartmouth College, Harvard University, Stanford University, University of Chicago, University of Michigan, University of Virginia, and University of Washington), nonprofit organizations (Educational Testing Service, RAND Corporation, the National Math and Science Initiative, and the New Teacher Center), and other educational consultants (Cambridge Education, Teachscape, Westat, and the Danielson Group).In addition, the National Board for Professional Teaching Standards and Teach for America have encouraged their members to participate. The American Federation of Teachers and the National Education Association have been engaged in the project. Indeed, their local leaders actively helped recruit teachers.

Yet, our most vital partners are the nearly 3000 teacher volunteers in six school districts around the country who volunteered for the project. They did so because of their commitment to the profession and their desire to develop better tools for feedback and growth. The six districts hosting the project are all predominantly urban districts, spread across the country: Charlotte-Mecklenburg Schools, Dallas Independent School District, Denver Public Schools, Hillsborough County Public Schools (including Tampa, Florida), Memphis City Schools, and the New York City Department of Education.

THE THREE PREMISES OF THE MET PROJECT

The MET project is based on three simple premises: First, whenever feasible, a teacher's evaluation should include his or her students' achievement
gains. Some raise legitimate concerns about whether student achievement gains measure all of what we seek from teaching. Of course, they're right. Every parent wants their children to build social skills and to acquire a love of learning. Likewise, our diverse society needs children who are tolerant. However, these goals are not necessarily at odds with achievement on state tests. For instance, it may be that an effective teacher succeeds by inspiring a love of learning, or by coaching children to work together

effectively. We will be testing these hypotheses in future reports, using the data from our student surveys. For example, it may be possible to add measures of student engagement as additional outcome measures. This would be particularly useful in grades and subjects where testing is not feasible. Others have raised separate concerns about whether "value-added" estimates (which use statistical methods to identify the impact of teachers and schools by adjusting for students'

prior achievement and other measured characteristics) are "biased" (Rothstein, 2010). They point out that some teachers may be assigned students that are systematically different in other ways—such as motivation or parental engagement—which affect their ultimate performance but are not adequately captured by prior achievement measures. As we describe below, our study aspires to resolve that question with a report next winter. At that time, we will be testing whether value-added measures accurately predict student achievement

following random assignment of teachers to classrooms (within a school, grade and subject). However, in the interim, there is little evidence to suggest that value-added measures are so biased as to be directionally misleading. On the contrary, in a small sample of teachers assigned to specific rosters by lottery, Kane and Staiger (2008) could not reject that there was no bias and that the value-added measures approximated "causal" teacher effects on student achievement. Moreover, a recent re-analysis of an experiment designed to test classroom size, but which also randomly assigned students to teachers, reported teacher effects on student achievement which were, in fact, larger than many of those reported in value-added analyses (Nye, Konstantopoulos and Hedges, 2004). Value-added measures do seem to convey information about a teacher's impact. However, evidence of bias at the end of this year may require scaling down (or up) the value-added measures themselves. But that's largely a matter of determining how much weight should be attached to value-added as one of multiple measures of teacher effectiveness.

Second, any additional components of the evaluation (e.g., classroom observations, student feedback) should be demonstrably related to student achievement gains. The second principle is fundamental, especially given that most teachers are receiving the same "satisfactory" rating now. If school districts and states simply give principals a new checklist to fill out during their classroom visits little will change. The only way to be confident that the new feedback is pointing teachers in the right direction—toward improved student achievement—is to regularly confirm that those teachers who receive higher ratings actually achieve greater student achievement gains on average. Even a great system can be implemented poorly or gradually succumb to "grade inflation". Benchmarking against student achievement gains is the best way to know when the evaluation system is getting closer to the truth—or regressing. Accordingly, in our own work, we will be testing whether student perceptions, classroom observations and assessments of teachers' pedagogical content knowledge are aligned with value-added

measures. Third, the measure should include feedback on specific aspects of a teacher's practice to support teacher growth and development. Any measure of teacher effectiveness should support the continued growth of teachers, by providing actionable data on specific strengths and weaknesses. Even if value-added measures are valid measures of a teacher's impact on student learning, they provide little guidance to teachers (or their supervisors) on what they need to do to improve. Therefore, our goal is to identify a package of measures, including student feedback and classroom observations, which would not only help identify effective teaching, but also point all teachers to the areas where they need to become more effective teachers themselves.

The Measures

To limit the need for extensive additional testing, the MET project started with grades and subjects where most states currently test students. We included those teaching mathematics or English language arts in grades 4 through 8. In addition, we added three courses which serve as gateways for high school students, where some states are using end-of-course tests: Algebra I, grade 9 English, and biology. The following data are being collected in their classrooms.

Measure 1: Student achievement gains on different assessments

Student achievement is being measured in two ways, with existing state assessments and with three supplemental assessments. The latter are designed to assess higher-order conceptual understanding. By combining the state tests and the supplemental tests, we plan to test whether the teachers who are successful in supporting student gains on the state tests are also seeing gains on the supplemental assessments. The supplemental assessments are Stanford 9 Open-Ended Reading assessment in grades 4 through 8, Balanced Assessment in Mathematics (BAM) in grades 4 through 8, and the ACT Quality Core series for Algebra I, English 9, and Biology.

Measure 2: Classroom observations and teacher reflections

One of the most difficult challenges in designing the MET project was to find a way to observe more than 20,000 lessons at a reasonable cost. Videotaping was an intriguing alternative to in-person observations (especially given our aspiration to test multiple rubrics), but the project had to overcome several technical challenges: tracking both students and a non-stationary teacher without having another adult in the classroom pointing the camera and distracting children, sufficient resolution to read a teacher's writing on a board or projector screen, and sufficient audio quality to hear teachers and students. The solution, engineered by Teachscape, involves panoramic digital video cameras that require minimal training to set up, are operated remotely by the individual teachers, and do not require a cameraperson.2 After class, participating teachers upload video lessons to a secure Internet site, where they are able to view themselves teaching (often for the first time). In addition, the participating teachers offer limited commentary

on their lessons (e.g., specifying the learning objective). Trained raters are scoring the lessons based on classroom observation protocols developed by leading academics and professional development experts. The raters examine everything from the teacher's ability to establish a positive learning climate and manage his/her classroom to the ability to explain concepts and provide useful feedback to students. The Educational Testing Service (ETS) is managing the lesson-scoring process. Personnel from ETS have trained raters to accurately score lessons using the following five observation protocols:

■■Classroom Assessment Scoring System (CLASS), developed by Bob Pianta and Bridget Hamre, University of Virginia Framework for Teaching, developed by Charlotte Danielson (2007)

■■Mathematical Quality of Instruction (MQI), developed by Heather Hill, Harvard University, and Deborah Loewenberg Ball, University of Michigan

■■Protocol for Language Arts Teaching Observations (PLATO), developed by Pam Grossman, Stanford University

■■Quality Science Teaching (QST) Instrument, developed by Raymond Pecheone, Stanford University A subset of the videos is also being scored by the National Board for Professional Teaching Standards (NBPTS). In addition, the National Math and Science Initiative (NMSI) is scoring a subset of videos using the UTeach Observation Protocol (UTOP) for evaluating math instruction, developed and field tested over three years by the UTeach program at the University of Texas at Austin.

Measure 3: Teachers' pedagogical content knowledge

ETS, in collaboration with researchers at the University of Michigan's Learning Mathematics for Teaching Project, has developed an assessment to measure teachers' knowledge for teaching—not just their content knowledge. Expert teachers should be able to identify common errors in student reasoning and use this knowledge to develop a strategy to correct the errors and strengthen student understanding. The new assessments to be administered this year focus on specialized knowledge that teachers use to interpret student responses, choose instructional strategies, detect and address student errors, select models to illustrate particular instructional objectives, and understand the special instructional challenges faced by English language learners.

Measure 4: Student perceptions of the classroom instructional environment

Students in the MET classrooms were asked to report their perceptions of the classroom instructional environment.

The Tripod survey instrument, developed by Harvard researcher Ron Ferguson and administered by Cambridge Education, assesses the extent to which students experience the classroom environment as engaging, demanding, and supportive of their intellectual growth. The survey asks students in the each of the MET classrooms if they agree or disagree with a variety of statements, including: "My teacher knows when the class

114

understands, and when we do not"; "My teacher has several good ways to explain each topic that we cover in this class"; and "When I turn in my work, my teacher gives me useful feedback that helps me improve." The goal is not to conduct a popularity contest for teachers. Rather, students are asked to give feedback on specific aspects of a teacher's practice, so that teachers can improve their use of class time, the quality of the comments they give on homework, their pedagogical practices, or their relationships with their students.

Measure 5: Teachers' perceptions of working conditions and instructional support at their schools
Teachers also complete a survey, developed by the New Teacher Center, about working conditions, school environment, and the instructional support they receive in their schools. Indicators include whether teachers are encouraged to try new approaches to improve instruction or whether they receive an appropriate amount of professional development. The survey is intended to give teachers a voice in providing feedback on the quality of instructional support they receive. The results potentially could be incorporated into measuring the effectiveness of principals in supporting effective instruction. Although we have not yet had a chance to analyze those data for the current report, they will be included in future analyses.

What We're Learning So Far
Before describing the measures and analysis in more detail, we briefly summarize our findings so far.
■■ In every grade and subject, a teacher's past track record of value-added is among the strongest predictors of their students' achievement gains in other classes and academic years. A teacher's value-added fluctuates from year-to-year and from class-to-class, as succeeding cohorts of students move through their classrooms. However, that volatility is not so large as to undercut the usefulness of value-added as an indicator (imperfect, but still informative) of future performance. The teachers who lead students to achievement gains in one year or in one class tend to do so in other years and other classes.
■■Teachers with high value-added on state tests tend to promote deeper conceptual understanding as well. Many are concerned that high value-added teachers are simply coaching children to do well on state tests. In the long run, it would do students little good to score well on state tests if they fail to understand key concepts. However, in our analysis so far, that does not seem to be the case. Indeed, the teachers who are producing gains on the state tests are generally also promoting deeper conceptual understanding among their students. In mathematics, for instance, after adjusting for measurement error, the correlation between teacher effects on the state math test and on the Balanced Assessment in Mathematics was moderately large.

■■Teachers have larger effects on math achievement than on achievement in reading or English Language Arts, at least as measured on state assessments. Many researchers have reported a similar result: teachers seem to have a larger influence on math performance than English Language Arts performance. A common interpretation is that families have more profound effects on children's reading and verbal performance than teachers. However, the finding may also be due to limitations of the current state ELA tests (which typically consist of multiple-choice questions of reading comprehension). When using the Stanford 9 Open-Ended assessment (which requires youth to provide written responses), we find teacher effects comparable to those found in mathematics. We will be studying this question further in the coming months, by studying teacher effects on different types of test items. However, if future work confirms our initial findings with the open-ended assessment, it would imply that the new literacy assessments, which are being designed to assess the new common core standards, may be more sensitive to instructional effects than current state ELA tests.

■■Student perceptions of a given teacher's strengths and weaknesses are consistent across the different groups of students they teach. Moreover, students seem to know effective teaching when they experience it: student perceptions in one class are related to the achievement gains in other classes taught by the same teacher. Most important are students' perception of a teacher's ability to control a classroom and to challenge students with rigorous work.

While student feedback is widely used in higher education, it is rare for elementary and secondary schools to ask youth about their experiences in the classroom. Nevertheless, soliciting student feedback is potentially attractive for a number of reasons: the questions themselves enjoy immediate legitimacy with teachers, school leaders and parents; it is an inexpensive way to supplement other more costly indicators, such as classroom observations; and the questionnaires can be extended to non-tested grades and subjects quickly. Our preliminary results suggest that the student questionnaires would be a valuable complement to other performance measures.Classroom observations are the most common form of evaluation today. As a result, our goal is to test several different approaches to identifying effective teaching practices in the classroom. In our work so far, we have some promising findings suggesting that classroom observations are positively related to student achievement gains. However, because less than 10 percent of the videos have been scored, we will be waiting until April to release results on the classroom observation methods.

MEASURING TEACHER-LEVEL VALUE-ADDED

In order to put the measures of student achievement on a similar footing, we first standardized test scores to have a mean of 0 and a standard deviation of 1 (for each district, subject year and grade level). We then estimated a statistical model controlling for each student's test score in that subject from the prior year, a set of student characteristics and the mean prior test score and the mean student characteristics in the

specific course section or class which the student attends. (We provide more details in the Technical Appendix.) The student characteristics varied somewhat by district (depending upon what was available), but typically included student demographics, free or reduced price lunch, ELL status and special education status. The statistical model produces an "expected" achievement for each student based on his or her starting point and the starting point of his or her peers in class. Some students "underperformed" relative to that expectation and some students "overperformed". In our analysis, a teacher's "value-added" is the mean difference, across all tested students in a classroom with a prior year achievement test score, between their actual and expected performance at the end of the year. If the average student in the classroom outperformed students elsewhere who had similar performance on last year's test, similar demographic and program participation codes—and classmates with similar prior year test scores and other characteristics—we infer a positive value-added, or positive achievement gain, attributable to the teacher. Using this method, we generated value-added estimates on the state assessments and the supplemental assessments for up to two course sections or classrooms teachers taught during 2009-10. We also calculated value-added estimates for teachers on state math and ELA test scores using similar data we obtained from the districts from the 2008-09 school year. (To be part of the MET project, a district was required to have some historical data linking students and teachers.)

In addition to state tests, students in participating classes took a supplemental performance assessment in spring 2010. Students in grades 4-8 math classes took the Balanced Assessment in Mathematics, while students in grades 4-8 English language arts classes took the SAT 9 Open-Ended Reading assessment. We chose these two tests because they included cognitively demanding content, they were reasonably well-aligned with the curriculum in the six states, had high levels of reliability, and had evidence of fairness to members of different groups of students. Balanced Assessment in Mathematics (BAM): Each of the test forms for the Balanced Assessment in Mathematics (BAM) includes four to five tasks and requires 50-60 minutes to complete. Because of the small number of tasks on each test form, however, we were concerned about the content coverage in each teacher's classroom. As a result, we used three different forms of the BAM—from the relevant grade levels in 2003, 2004 and 2005—in each classroom. In comparison to many other assessments, BAM is considered to be more cognitively demanding and measures higher order reasoning skills using question formats that are quite different from those in most state mathematics achievement tests. There is also some evidence that BAM is more instructionally sensitive to the effects of reform-oriented instruction than a more traditional test (ITBS). Appendix 1 includes some sample items from the BAM assessment.SAT 9 Reading Open-Ended Test: The Stanford 9 Open-Ended (OE) Reading assessment contains nine open-ended tasks and takes 50 minutes to complete. The primary difference between the Stanford 9 OE and traditional state reading assessments is the exclusive use of open-ended items tied to

117

extended reading passages. Each form of the assessment consists of a narrative reading selection followed by nine questions. Students are required to not only answer the questions but also to explain their answers. Sample items from the Stanford 9 OE exam are available in Appendix

## 2.MEASURING STUDENT PERCEPTIONS

College administrators rarely evaluate teaching by sitting in classrooms—as is the norm in K–12 schools. Rather, they rely on confidential student evaluations. Organizers of the MET project wondered whether such information could be helpful in elementary and secondary schools, to supplement other forms of feedback. The MET student perceptions survey is based on a decade of work by the Tripod Project for School Improvement. Tripod was founded by Ronald F. Ferguson of Harvard University and refined in consultation with K-12 teachers and administrators in Shaker Heights, Ohio, and member districts of the Minority Student Achievement Network. For the MET project, the Tripod surveys are conducted either online or on paper, at the choice of the participating school. For online surveys, each student is given a ticket with a unique identification code to access the web site. For the paper version, each form is pre-coded with a bar code identifier. When a student completes a paper survey, he or she seals it in a thick, non-transparent envelope. The envelope is opened only at a location where workers scan the forms to capture the data. These precautions are intended to ensure that students feel comfortable providing their honest feedback, without the fear that their teacher will tie the feedback to them. The Tripod questions are gathered under seven headings, or constructs, called the Seven C's. The seven are: Care, Control, Clarify, Challenge, Captivate, Confer and Consolidate. Each of the C's is measured using multiple survey items. The table below provides a list of the items used to measure each of the Seven C's on the elementary and secondary survey respectively. The indices for the Seven C's have proven highly reliable—in the range of 0.80 and above. They are also stable for a given teacher during the school year. (Corrected for measurement error, the correlations over time in classroom level responses in December and March of the same school year ranged between 0.70 and 0.85.). Although we test below whether their judgments correspond with achievement gains, classrooms of students clearly differentiate among teachers. The table below reports the 25th and 75th percentiles of the classroom level agreement rates for the elementary and secondary items respectively. For instance, one of the questions asking students to provide feedback on a teacher's success at classroom management asks students to agree or disagree with the statement, "My classmates behave the way my teacher wants them to." In a quarter of classrooms, less than 23 percent of students agreed and in another quarter more than 53 percent of students agreed. In answering the question, "Our class stays busy and does not waste time", a quarter of classrooms had fewer than 44 percent of students agreeing and a quarter of classrooms had more than 71 percent of students agreeing.Secondary school students seemed particularly willing to distinguish between

teachers. Under the Tripod Challenge index for secondary school students, for example, students were asked to agree or disagree with the statement, "In this class, the teacher accepts nothing less than our full effort." In a quarter of classrooms, less than half of students agreed with that statement; in another quarter of classrooms, more than 81 percent of students agreed.

For further details see:
http://www.gatesfoundation.org/college-ready-education/Pages/measures-effective-teaching-project.aspx

Table A11. Rates of Agreement at the Classroom Level to Tripod Survey Items: Secondary

| CARE | 25TH PERCENTILE | 75TH PERCENTILE |
|---|---|---|
| My teacher in this class makes me feel that s/he really cares about me. | 40 | 73 |
| My teacher seems to know if something is bothering me. | 22 | 50 |
| My teacher really tries to understand how students feel about things. | 35 | 68 |
| **CONTROL** | | |
| Student behavior in this class is under control. | 30 | 67 |
| I hate the way that students behave in this class. | 10 | 32 |
| Student behavior in this class makes the teacher angry. | 17 | 50 |
| Student behavior in this class is a problem. | 9 | 37 |
| My classmates behave the way my teacher wants them to. | 20 | 57 |
| Students in this class treat the teacher with respect. | 33 | 79 |
| Our class stays busy and doesn't waste time. | 36 | 69 |
| **CLARIFY** | | |
| If you don't understand something, my teacher explains it another way. | 60 | 86 |
| My teacher knows when the class understands, and when we do not. | 50 | 77 |
| When s/he is teaching us, my teacher thinks we understand even when we don't. | 9 | 27 |
| My teacher has several good ways to explain each topic that we cover in this class. | 53 | 82 |
| My teacher explains difficult things clearly. | 50 | 79 |
| **CHALLENGE** | | |
| My teacher asks questions to be sure we are following along when s/he is teaching. | 75 | 93 |
| My teacher asks students to explain more about answers they give. | 63 | 86 |
| In this class, my teacher accepts nothing less than our full effort. | 53 | 81 |
| My teacher doesn't let people give up when the work gets hard. | 56 | 83 |
| My teacher wants us to use our thinking skills, not just memorize things. | 63 | 85 |
| My teacher wants me to explain my answers—why I think what I think. | 59 | 83 |
| In this class, we learn a lot almost every day. | 52 | 81 |
| In this class, we learn to correct our mistakes. | 56 | 83 |
| **CAPTIVATE** | | |
| This class does not keep my attention—I get bored. | 14 | 36 |
| My teacher makes learning enjoyable. | 33 | 72 |
| My teacher makes lessons interesting. | 33 | 70 |
| I like the ways we learn in this class. | 47 | 81 |
| **CONFER** | | |
| My teacher wants us to share our thoughts. | 47 | 79 |
| Students get to decide how activities are done in this class. | 5 | 20 |
| My teacher gives us time to explain our ideas. | 43 | 73 |
| Students speak up and share their ideas about class work. | 40 | 68 |
| My teacher respects my ideas and suggestions. | 46 | 75 |
| **CONSOLIDATE** | | |
| My teacher takes the time to summarize what we learn each day. | 38 | 67 |
| My teacher checks to make sure we understand what s/he is teaching us. | 58 | 86 |
| We get helpful comments to let us know what we did wrong on assignments. | 45 | 74 |
| The comments that I get on my work in this class help me understand how to improve. | 46 | 74 |

Note: For each question, a quarter of classrooms had a lower percentage of students agreeing than the 25th percentile and another quarter of classrooms had rates of agreement higher than the 75th percentile. There were 2,986 secondary classrooms with more than 5 students responding.

**Gates millennium scholars**

*Overview of the program:*

The Gates Millennium Scholars Program (GMS) was established in 1999 and initially funded by a $1 billion grant from the Bill & Melinda Gates Foundation. The goal of GMS is to promote academic excellence and to provide an opportunity for outstanding minority students with significant financial need to reach their highest potential by:

- Reducing financial barriers for African American, American Indian/Alaska Native, Asian Pacific Islander American and Hispanic American students with high academic and leadership promise who have significant financial need;
- Increasing the representation of these target groups in the disciplines of computer science, education, engineering, library science, mathematics, public health and the sciences, where these groups are severely underrepresented;
- Developing a diversified cadre of future leaders for America by facilitating successful completion of bachelor's, master's and doctoral degrees; and
- Providing seamless support from undergraduate through doctoral programs, for students selected as Gates Millennium Scholars entering target disciplines.

The GMS Scholarship Award Provides:

- Support for the cost of education by covering unmet need and self-help aid;
- Renewable awards for Gates Millennium Scholars maintaining satisfactory academic progress;
- Graduate school funding for continuing Gates Millennium Scholars in the areas of computer science, education, engineering, library science, mathematics, public health or science;
- Leadership development programs with distinctive personal, academic and professional growth opportunities.

More in depth, the award will be based on the cost of tuition, fees, books, and living expenses for the academic year as well as the availability of grants and other scholarships reported on the submitted financial aid award letter. The scholarship, for the undergraduate award, may be renewed annually based on satisfactory academic progress, full-time status, and the timely submission of required documents.

*Target group and selection:*

The Gates Millennium Scholars (GMS) program in 2011 will select 1,000 talented students to receive a good-through-graduation scholarship to use at any college or university of their choice. Gates Millennium Scholars will be provided with personal and professional development through our leadership programs along with academic support throughout their college career.

Students are eligible to be considered for a GMS scholarship if they:

- Are African American, American Indian/Alaska Native, Asian Pacific Islander American or Hispanic American
- Are a citizen, national or legal permanent resident of the United States
- Have attained a cumulative high school GPA of 3.3 on an unweighted 4.0 scale or have earned a GED[1]
- Will enroll for the first time at a U.S. located, accredited college or university as a full-time, degree-seeking, first-year student (with the exception of students pursuing a high school diploma while concurrently enrolled). First-time college enrollees can also be GED recipients.
- Have demonstrated leadership abilities through participation in community service, extracurricular or other activities
- Meet the Federal Pell Grant eligibility criteria[2]
- Have completed and submitted all three required forms: the student's application (Nominee Personal Information Form), an evaluation of the student's academic record (Nominator Form) and an evaluation of the student's community service and leadership activities (Recommender Form) by the deadline.

*Figures & Evaluation:*
- The Gates Millennium Scholars program has awarded 12,000 scholarships to exceptionally talented low-income students of color since 2000, with nearly eight in 10 scholars graduating from college in five years
- Funded more than 13,000 Gates Millennium Scholars since the inception of the program
- Obtained a 79.9% graduation rate in five years*
- Supported Gates Millennium Scholars enrolled in more than 1,500 colleges and universities
- Supported Gates Millennium Scholars representing 50 states and five outlying areas
- Graduated over 5,000 Gates Millennium Scholars since the program's inception
- Five year retention rate of 87.7%

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[1] The GED - General Educational Development - is a certification obtained through a test which is accepted as equal to a high school diploma by almost all companies and colleges in the country.

[2] The *Federal Pell Grant* Program is a program which provides need-based grants to low-income undergraduate and certain post baccalaureate students. Unlike a loan, the Pell grant does not have to be repaid.

## KIPP – knowledge is power program

*Overview of the program:*

KIPP, the Knowledge Is Power Program, is a national network of free, open-enrollment, college-preparatory public schools with a track record of preparing students in underserved communities for success in college and in life. There are currently 99 KIPP schools in 20 states and the District of Columbia serving more than 26,000 students.

KIPP began in 1994 when two teachers, Mike Feinberg and Dave Levin, launched a fifth-grade public school program in inner-city Houston, TX, after completing their commitment to Teach For America. In 1995, Feinberg remained in Houston to lead KIPP Academy Middle School, and Levin returned home to New York City to establish KIPP Academy in the South Bronx. These two original KIPP Academies became the starting place for a growing network of schools that are transforming the lives of students in under-resourced communities, and redefining the notion of what is possible in public education.

Since their founding, the two original KIPP Academies have sustained track records of high student achievement. While less than 40 percent of low-income students attend college nationally, KIPP's college matriculation rate stands at more than 85 percent for students who complete the eighth grade at KIPP. More than 90 percent of KIPP alumni go on to college-preparatory high schools; collectively, they have earned millions of dollars in scholarships and financial aid since 2000.

KIPP builds a partnership among parents, students, and teachers that puts learning first. By providing outstanding educators, more time in school learning, and a strong culture of achievement, KIPP is helping all students climb the mountain to and through college. KIPP schools share a core set of operating principles known as the Five Pillars:

- High Expectations. KIPP schools have clearly defined and measurable high expectations for academic achievement and conduct that make no excuses based on the students' backgrounds. Students, parents, teachers, and staff create and reinforce a culture of achievement and support through a range of formal and informal rewards and consequences for academic performance and behavior.

- Choice & Commitment. Students, their parents, and the faculty of each KIPP school choose to participate in the program. No one is assigned or forced to attend a KIPP school. Everyone must make and uphold a commitment to the school and to each other to put in the time and effort required to achieve success.

- More Time. KIPP schools know that there are no shortcuts when it comes to success in academics and life. With an extended school day, week, and year, students have more time in the classroom to acquire the academic knowledge and skills that will prepare them for competitive high schools and colleges, as well as more opportunities to engage in diverse extracurricular experiences.

- Power to Lead. The principals of KIPP schools are effective academic and organizational leaders who understand that great schools require great school leaders. They have control over their school budget and personnel. They are free to swiftly move dollars or make staffing changes, allowing them maximum effectiveness in helping students learn.

- Focus on Results. KIPP schools relentlessly focus on high student performance on standardized tests and other objective measures. Just as there are no shortcuts, there are no excuses. Students are expected to achieve a level of academic performance that will enable them to succeed at the nation's best high schools and colleges.

*Special projects run by KIPP: Leadership Development and the Fisher Fellowship year*

The Foundation focuses on training leaders at all levels. Through the KIPP School Leadership Program, the Foundation has trained over 100 individuals to found new KIPP schools over the past ten years. The KIPP Leadership Pathways Program ensures the quality of education within a school over the long term, offering leadership development for succession leaders, emerging leaders and teacher leaders.

The KIPP Foundation has recently developed a new leadership competency model that will serve as the anchor for Foundation and regional efforts to recruit, assess, develop and retain excellent leaders. Regions and schools are able to develop performance and development cultures based on a shared understanding of what it means to be an effective KIPP leader and how to grow both within a given leadership position and from one leadership position to the next.

The Fisher Fellowship is a one-year program that prepares exceptional instructional leaders to design, found and lead new KIPP school in an educationally underserved community.

The program is based on:

a) Five weeks of intensive coursework in a university setting led by KIPP staff, and featuring experts from education, business, and leadership development. Institute lays the foundation for the knowledge, skills, and confidence Fellows need to begin crafting a detailed School Design Plan.

Institute Program Themes:
- Understanding Cultural Contexts in our Educational Practices
- Self-awareness and Our Own Leadership Styles, Strengths, and Weaknesses
- Leadership and Organizational Alignment
- Instructional Vision and Strategic Plan
- Operational Management
- Tying it Together: Leadership, Instruction, and Culture.

b) Ten weeks of residencies at KIPP and non-KIPP schools that fully expose Fellows to school culture and decision-making processes through interactions with students, parents and teachers.

c) Three professional development meetings of one to two weeks for continued coursework throughout the fellowship year.

d) School Design Plan: A comprehensive business plan Fellows develop that includes all elements of their school vision. Fellows receive ongoing feedback from leadership coaches and regional leaders.

e) Foundation Support: Ongoing feedback on leadership skills and development through bi-weekly individualized leadership coaching calls.

f) Evaluation: Three formal evaluations based on a competency-aligned Individualized Leadership Plan (ILP).

Through generous support from Don and Doris Fisher, all Fisher Fellows receive an annual stipend based on previous salary (ranging from $60,000 to $80,000), along with a complete benefits package that includes medical, dental, vision, life insurance and a 401(k) retirement plan. Additionally, the KIPP Foundation provides for all travel, housing and coursework during the Fellowship year.

*Figures:*

The costs of running KIPP schools and the level of per-pupil funding that KIPP schools receive varies greatly across the country, due to widely divergent funding allocations at the state and local level. On average, it costs about $1,100 to $1,500 per student to fund KIPP's extended school calendar, higher staff salaries and other KIPP extras, such as field trips and enrichment classes.

The majority of KIPP schools are public charter schools, and as such they typically only receive 60 to 90 percent of the operational revenue and none of the capital expenditure revenue of district schools. As a result, KIPP schools have to use operating funds to pay for non-core education costs such as facilities and busing. Schools then raise independent funds to cover the rest of their expenses.

*Evaluation:*

KIPP's Healthy Schools Initiative is focused on measuring key elements of school health across the network. These data are focused both on traditional measures of performance like test scores, and also longer-term outcomes like college matriculation and persistence. In addition, Healthy Schools examines the on-the-ground practices and conditions that make a school healthy. These data allow KIPP leaders to critically assess the performance of their schools, identify best practices by viewing data from across the network, and share strategies for improvement with one another.

In November 2007, Mathematica Policy Research was selected to conduct a longitudinal evaluation of KIPP's impact on middle school students. This rigorous study delivers information about both academic and non-academic outcomes. Findings from the National Evaluation will help KIPP identify opportunities for program improvement

and to share knowledge and will be used to share insights with the broader education community. Briefly, the study has pointed out that:

1. KIPP does not attract more able students (as compared to neighboring public schools).

2. KIPP schools typically have a statistically significant impact on student achievement.

3. Academic gains at many KIPP schools are large enough to substantially reduce race and income-based achievement gaps.

4. Most KIPP schools do not have higher levels of attrition than nearby district schools.

"For the vast majority of KIPP schools studied, impacts on students' state assessment scores in mathematics and reading are positive, statistically significant, and educationally substantial."

## Roads to success

*Overview of the program:*

Roads to Success supports schools and community-based organizations seeking to improve student performance, graduation, postsecondary education acceptance and retention rates in the following ways:

It offers a proven guidance program that can significantly improve the employment opportunities and education outcomes of adolescents. The program can be delivered in a variety of settings – including middle school and high school classrooms, after-school youth development programs, and summer camps and residential sites. Our program is designed to strengthen the efforts of educators, school counselors, youth workers, and volunteers. The Roads to Success program is user-friendly, low-cost, and makes minimal time demands on people who deliver it.

More in depth, the program offers a research-based grade 7 through 12 guidance curriculum, with student motivation at its core. Roads to Success' grade-by-grade lesson plans offer a comprehensive, systematic way to address key issues: study skills, career development, reasons to complete and excel in high school, steps to post-secondary education attainment, finding and keeping a job, and financial literacy. The program is designed for delivery in 45-minute, once-weekly sessions executed over 4 to 6 years. Each lesson is interactive, exciting, and fun. The Roads to Success program materials are free and can be downloaded for non-commercial use.

*Figures:*

Nov. 2009 - Roads to Success has been awarded a $430,000 grant from the Bill and Melinda Gates Foundation to make its college and career guidance curriculum available to teachers, counselors and youth workers across the country. The grant from the Gates Foundation coincides with the launch of a website (/www.roadstosuccess.org), which makes the Roads to Success curriculum available for electronic download, at no cost to

126

non-commercial users. The Gates grant will enable Roads to Success to support the use of the curriculum by partner organizations through training and technical assistance.

*Evaluation:*

Researchers at Mathematica Policy Research used a random assignment design to estimate the impacts of receiving RTS in grades 7 and 8. More than half of the students in these schools were eligible for free or reduced-price lunches and the schools had few minority students. Using student survey data collected from more than 1,400 students, they found no evidence of statistically significant impacts of the RTS program on motivation to go to school to learn job skills or on learning and study habits at the end of grade 8. A statistically significant impact has been found at the .10 level suggesting that RTS reduced a composite measure of negative behaviors. Exploratory analyses of subcomponents show positive impacts of RTS on talking to school staff about career and school plans, confidence in knowing how to find out about what types of jobs are best, and confidence in knowing what is required to succeed in different careers.

## THE CARNEGIE FOUNDATION

The Carnegie Foundation for the Advancement of Teaching was founded by Andrew Carnegie in 1905. It is an independent policy and research center. Its current mission is to support needed transformations in American education through tighter connections between teaching practice, evidence of student learning, the communication and use of this evidence, and structured opportunities to build knowledge.

The improvement of teaching and learning is central to all of the Foundation's work. It brings together researchers, teachers, policymakers and members of organizations with common interests in education in order to invent new knowledge and to develop tools and ideas that allow to foster positive change and enhanced learning in US schools.

In 1997, the Foundation moved from Princeton, N.J., to the San Francisco Bay area. In 2004, the Foundation built on Stanford University land near the campus.

*Lines of activity:*

The Foundation's work focuses on:

- moral, civic and political education; preparation for the professions (law, engineering, clergy, medicine and nursing);
- reform of the Ph.D.;
- field-building work with teachers at all levels to develop new models for documenting classroom practice in ways that other educators can study, adapt and implement.

The Foundation continues to work with community colleges to improve basic skills education in that sector. More recently the Foundation, using both technology and face-to-face communication, is closely examining how new technological tools and digital world social networking can contribute to learning at every level of the education spectrum

For the purposes of this report, of particular interest is the U.S. Professors of the Year Award Program, created in 1981 to increase awareness of the importance of undergraduate instruction at all types of higher education institutions.

## The U.S. Professors of the Year Award Program

*Overview of the program:*

The U.S. Professors of the Year Award Program salutes the most outstanding undergraduate instructors in the country-those who excel in teaching and positively influence the lives and careers of students. Sponsored by CASE and The Carnegie

Foundation for the Advancement of Teaching, it is the only national program to recognize excellence in undergraduate teaching and mentoring.

The U.S. Professors of the Year Award Program was created in 1981 to increase awareness of the importance of undergraduate instruction at all types of higher education institutions. The program recognizes faculty members for their achievement as undergraduate professors. The Council for Advancement and Support of Education (CASE) began the Professors of the Year program with the Carnegie Foundation hosting the final round of judging. The Carnegie Foundation sponsors the cash award given to U.S. national winners.

In 1994, the program began awarding national winners in four categories based on the Carnegie Classification of Institutions of Higher Education. CASE renamed the award after Carnegie that year because of its historic involvement with the practice and the scholarship of teaching.

The State Professors of the Year Award Program selects outstanding educators in all 50 states, the District of Columbia, Guam, Puerto Rico and the U.S. Virgin Islands, provided there are winning entries. Winners receive personalized award certificates and receive national and local media recognition.

*Target group and selection:*
All undergraduate teachers in the United States, of any academic rank at any type of undergraduate institution, are eligible for the award. Entries are judged by top U.S. educators and other active participants in education.

Both national and state winners are chosen on the basis of their extraordinary dedication to undergraduate teaching, determined by excellence in the following four areas:
• impact on and involvement with undergraduate students;
• scholarly approach to teaching and learning;
• contributions to undergraduate education in the institution, community and profession;
• support from colleagues and current and former undergraduate students.

Competition for the U.S. Professors of the Year takes place in several stages. Each candidate must first be selected from many qualified peers at his or her own institution and nominated for the award. A campus may enter up to three professors. Letters of support and endorsements from current and former students, colleagues and presidents or academic deans accompany the entries.

CASE assembles the preliminary expert judging panels comprised of deans and professors, education writers, and government, foundation and association representatives. The first panel selects about 100 semifinalists. The second panel determines six finalists in each of the four categories. CASE forwards the finalists' materials to the Carnegie Foundation, which convenes the third and final panel. This

panel, which includes a student, a former U.S. Professor of the Year, and education association and campus representatives, selects the national winners and completes the selection of state winners from entries that meet the program's demanding criteria.

Benefits and awards:

In recognizing faculty members who display superb teaching skills, the U.S. Professors of the Year program gives institutions more than just bragging rights. The awards focus attention on excellence in undergraduate teaching and provide models to which others can aspire. They also strengthen community interest in the school and build public support for the academic programs.

Winners teach in all types of undergraduate settings nationwide, private and public, from two-year and four-year colleges to universities. They are highlighted in the media and sought after as presenters. Some testify before Congress. Others are guests on talk shows and speakers at business, civic and professional events where they frequently advocate for undergraduate education. Prominent national publications cover the celebrations in Washington. Local print and broadcast outlets and campus and alumni periodicals shine the spotlight on both winners and their institutions.

With each success story, people learn more about the fields the winners teach and also what makes a good undergraduate teacher. After all, it is through the art of teaching, the force of their knowledge, and the passion of their convictions that teachers can inspire students to reach beyond the ordinary.

Each national winner receives:
• $5,000 contributed by The Carnegie Foundation for the Advancement of Teaching
• An all-expense paid trip (airfare, meals, and two nights' hotel accommodations) for the winner, one guest and a current or former student to Washington, D.C., for the November awards celebration
• An invitation to speak at the November awards luncheon and recognition at an evening Congressional reception (members of Congress from each winner's state are invited to attend the reception)
• National, regional and local media coverage
• An elegantly framed certificate of recognition
• An opportunity to participate in activities that highlight the importance of teaching throughout the year; these activities could include media interviews, speaking engagements, teaching forums and other events coordinated through each winner's institution.

Each state-level winner receives:

- Complimentary attendance for two at the November awards luncheon and Congressional reception
- Personalized award certificate
- Media recognition
- Acknowledgement at the awards luncheon
- Posting on the U.S. Professors of the Year website.

## GOLDMAN SACHS FOUNDATION

The Goldman Sachs Foundation is a global philanthropic organization funded by The Goldman Sachs Group, Inc. The Foundation's mission is to promote excellence and innovation in education and to improve the academic performance and lifelong productivity of young people worldwide. It achieves this mission through a combination of strategic partnerships, grants, loans, private sector investments, and the deployment of professional talent from Goldman Sachs. Funded in 1999, the Foundation has awarded grants of $94 million since its inception, providing opportunities for young people in more than 20 countries.

The Foundation supplements its financial support with social and intellectual capital from Goldman Sachs. By drawing upon the firm's leadership development expertise and commitment to education, the Foundation is able to maximize the impact of its philanthropic investments.

For the purposes of this report of particular interest seems to be the Next Generation Venture Fund, a project, co-sponsored by Goldman Sachs, which invests in academically talented young people who have the potential to succeed in the classroom and beyond.

### The Next Generation Venture Fund

*Overview of the program:*
The Next Generation Venture Fund (NGVF) offers financial help and academic resources to qualified eighth grade students, and continues to provide such services through their remaining pre-college years.

NGVF is a joint venture of:
* the Johns Hopkins University Center for Talented Youth (CTY);
* the Duke University Talent Identification Program (Duke TIP);
* the Northwestern University Center for Talent Development (CTD);
* the Center for Bright Kids (CBK);
* the Network For Teaching Entrepreneurship (NFTE);

with the support of founding corporate partner, the Goldman Sachs Foundation and other donors. NGVF builds a pipeline for high potential students from diverse backgrounds that leads from middle school, to college, careers and key leadership roles—opportunities that might otherwise be missed.

More in depth, the Next Generation Venture Fund provides scholastic, personal, and social enrichment to qualifying 8th grade students through high school, employing:
* Rigorous advanced/college-level courses, available on campus and online, proven to teach analytical, quantitative, writing, and reasoning skills;

- Career and leadership development programs to encourage aspirations;
- Mentoring with a strong thematic base by private-sector executives and bright college students who serve as role models;
- Networking opportunities to connect high-achieving underrepresented students to each other and to supportive sponsors who can broaden their horizons and promote their development;
- Counseling and assistance in the college application process.

Targeting high-potential youth from groups underrepresented at selective colleges, the Next Generation Venture Fund works with students from around the country during their formative secondary school years, strengthening their ability to compete and excel in rigorous academic settings.

The nation's three major university-based Talent Searches aggressively recruit students from schools across the United States. Tapping their expertise in identifying and developing the academic abilities of our nation's brightest students, they select eighth graders on the basis of their high scores on the SAT or ACT college admission tests, financial need, and motivation to succeed. Over the five years, the students take intensive summer and distance education courses and receive educational advising and support in areas such as study skills and SAT preparation—all designed to propel them to enroll and succeed at the nation's most selective colleges and universities.

*Content:*
The program provides the following activities:

| | |
|---|---|
| 8th Grade: | Recruiting |
| | College-Level Summer Courses |
| | Parent Workshop |
| 9th Grade: | Individualized Education Plan |
| | Advanced Online Courses |
| | Mentoring/Entrepreneurship |
| | College-Level Summer Courses |
| 10th Grade: | Academic Advising |
| | Mentoring/Entrepreneurship |
| | Training |
| 11th Grade: | Academic Advising |
| | SAT Preparation Course |
| 12th Grade: | Academic Advising |
| Support Elements | Evaluation/Communications |
| | Administration |
| | Optional Activities |

In addition to the activities listed, NGVF students come together at least twice a year to celebrate their success and to focus on a theme, such as careers or leadership.

*Figures:*
Number of students in pilot: 403

Number of current students: 551

Gender: 55% girls, 45% boys

A tax-deductible investment of $25,000[3] covers the cost of one student's participation in the program over five years, providing him or her with the intensive academic and leadership training and support necessary to earn admission to top colleges. By wisely allocating dollars to programs proven to boost academic performance, the Next Generation Venture Fund makes a dramatic impact on young people's lives, brightening the future for us all.

*Evaluation:*

The Fund provides periodic updates on the progress of NGVF students, allowing investors to assess their returns. The ultimate payoff, however, comes at the end of the high school program when students receive their college acceptance letters, and in the years to come, when these young men and women take their rightful place among a new and more diverse generation of leaders.

The outstanding students in the pilot's first cohort to graduate from high school are now attending such selective colleges as Amherst, Georgetown, MIT, Penn, and Wesleyan, a substantial accomplishment for students who come from families of modest means in hard-pressed communities.

The achievements of students who have been supported by the Next Generation Venture Fund demonstrate just how effective NGVF's investments can be. NGVF students[4]:

- Enrolled in more Advanced Placement courses than their peers
- Earned competitive SAT scores
- Elevated their educational goals
- More than three-quarters of NGVF students who have reached college age have enrolled in highly selective colleges and universities.

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[3] $25,000 covers the cost of the recommended elements of the program. Additional items can be added depending on donor interest.

[4] Evaluation conducted by Michael T. Nettles and Catherine M. Millett of the Policy Evaluation & Research Center, Educational Testing Service.

## TOSHIBA AMERICAN FOUNDATION

### Grades 6-12 Grants

Founded in 1990, with support from Toshiba Corporation and the Toshiba America Group Companies, Toshiba America Foundation (TAF) is dedicated to helping classroom teachers make mathematics and science learning fun and successful for students in U.S. schools. As indicated on the website home page "Toshiba America Foundation believes science and mathematics are exciting fields in which all students can succeed with the proper tools and instruction". Therefore TAF grants fund the projects, ideas and materials teachers need to innovate in their math and science classrooms. TAF is interested in funding projects designed by teachers or small teams of teachers for use in their own schools. TAF grants support public and nonprofit private schools throughout the United States.

TAF has two different kinds of grants[5]. The first one for elementary school aims at granting programs for 0-5 science and math education (Grades K-5). The second one for middle and high schools is devoted to grant programs for 6-12 science and math education (Grades 6-12). While Grade K-5 applications are accepted once a year on October 1st[6], Grade 6-12 applications for $5,000 or less are accepted on a rolling basis, throughout the calendar year. Grant requests of more than $5,000 are reviewed twice a year and applications for grants of more than $5,000 are due February 1st and August 1st each year.

A list of schools that have received grants (and also the amount) is provided in tables A12, A13, A14 below. In box A4 it is possible to see a few examples of programs that have been funded in 2009. TAF asked teachers who received the grants to fill in a final report within 45 days after the official end date of the project. TAF understands that projects do not always go exactly as planned, so invite teachers to feel free to be candid about their experience with the project. TAF asks also to provide tangible

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[5] TAF will not contribute to general operations, capital projects, endowments, conferences, independent study, fund raising events, or similar activities. Religious or political causes will not be supported. Organizations that discriminate on the basis of sex, race, age, disability or religion are not eligible for funding. No grants will be made to individuals. Summer projects or after school programs cannot be considered. Salaries, facility maintenance, textbooks, video production, audio-visual equipment (e.g. electronic white boards, document projectors, student response systems) and education research will not be funded. No grants are available for computer hardware. No single school may receive more than one grant at a time. No new applications will be considered from grantees until final reports are approved. TAF funding is usually directed to K-12 schools. Educational nonprofits and universities working with K-12 teachers are occasionally considered, but please call the foundation first.

[6] For further information on Grades K-5 and examples of granted projects, see the following webpage: http://www.toshiba.com/taf/k5_grants.jsp.

representations of students work involved in the project and, in fact, teachers send TAF press clips, photos, websites created by the class, or examples of community recognition that resulted from the project. Teachers can apply for further grants years by years in order to complete their projects.

Table A12. Featured Grants for Grades 6 – 12 during 2009

| School | Country and State | Grant |
|---|---|---|
| Academy of Environmental Science | Crystal River, FL | $5,000.00 |
| Arlington High School | La Grangeville, NY | $9,980.00 |
| Bard High School Early College Manhattan | New York, NY | $6,410.00 |
| Belmont High School | Belmont, NH | $9,940.00 |
| Canyon Ridge Middle School | Austin, TX | $3,890.00 |
| Cave Spring High School | Roanoke, VA | $9,590.00 |
| Central Catholic Jr-Sr High | Lafayette, IN | $1,960.00 |
| Clearwood Junior High School | Slidell, LA | $600.00 |
| Columbia County Alternative School | Grovetown, GA | $1,330.00 |
| Dayton Regional STEM School | Fairborn, OH | $4,993.00 |
| Dwight D. Eisenhower Middle School | Freehold, NJ | $3,510.00 |
| East Rockingham High School | Elkton, VA | $7,950.00 |
| Felix Valera Senior High School | Miami, FL | $9,880.00 |
| Freetown-Lakeville Middle School | Lakeville, MA | $4,050.00 |
| Friends of the High School for Environmental Studies | New York , NY | $11,500.00 |
| G.W. Bush Middle School | Tumwater, WA | $4,120.00 |
| Gilmer High School | Ellijay, GA | $1,910.00 |
| Girls Preparatory School | Chattanooga, TN | $4,560.00 |
| Hillcrest High School | Jamaica Estates, NY | $5,000.00 |
| Hilltop Montessori School | Brattleboro, VT | $3,560.00 |
| Indian Creek Upper School | Crownsville, MD | $3,800.00 |
| Jettie S. Tisdale School | Bridgeport, CT | $1,630.00 |
| Joseph F. Tuttle Middle School | Crawfordsville, IN | $4,840.00 |
| Keystone School | San Antonio, TX | $2,900.00 |
| KIPP Academy Lynn | Lynn, MA | $2,960.00 |
| Laguna Beach High School | Laguna Beach, CA | $4,800.00 |
| Linwood Middle School | North Brunswick, NJ | $5,000.00 |
| Lopez Island High School | Lopez Island, WA | $11,080.00 |
| Marine Academy of Technology and Environmental Science | Manahawkin, NJ | $3,000.00 |
| Mat-Su Career and Technical High School | Wasilla, AK | $5,000.00 |
| Medina Valley High School | Castroville, TX | $2,100.00 |
| Middlebury Union High School | Middlebury, VT | $4,550.00 |
| Mother Seton Regional High School | Clark, NJ | $4,980.00 |
| Muscle Shoals City Schools | Muscle Shoals, AL | $13,950.00 |
| National Science Teachers Assocation | Arlington, VA | $50,000.00 |

| | | |
|---|---|---|
| New Teacher Center | Santa Cruz, CA | $30,000.00 |
| Polk County High School | Columbus, NC | $15,000.00 |
| Roland Park Country Day School | Baltimore, MD | $3,010.00 |
| Rutgers University Waksman Institute | Piscataway, NJ | $25,400.00 |
| San Miguel High School | Tucson, AZ | $2,710.00 |
| Santa Clara Unified School District | Santa Clara, CA | $4,740.00 |
| Sir Francis Drake High School | San Anselmo, CA | $4,200.00 |
| South Plainfield High School | South Plainfield, NJ | $5,000.00 |
| Stuyvesant High School | New York, NY | $20,200.00 |
| T. Wingate Andrews High School | High Point, NC | $4,970.00 |
| Tri-Village Local School District | New Madison, OH | $14,900.00 |
| Verbena High School | Verbena, AL | $250.00 |
| Washington University | St. Louis, MO | $25,000.00 |
| West Salem High School | Salem, OR | $6,880.00 |
| Wilkes Central High School | Wilkesboro, NC | $4,420.00 |
| William Marsh Rice University | Houston, TX | $29,450.00 |

Table A13. Featured Grants for Grades 6 – 12 during 2008

| School | Country and State | Grant |
|---|---|---|
| Apple Valley High School | Apple Valley, MN | $2,020 |
| Baltimore Talent Development High School | Baltimore, MD | $4,500 |
| Bard High School Early College II | Elmhurst, NY | $13,440 |
| Battle Lake School | Battle Lake, MN | $4,640 |
| Bernards High School | Bernardsville, NJ | $5,000 |
| Black River High School | Sullivan, OH | $4,260 |
| Bolsa Chica Conservancy | Huntington Beach, CA | $10,000 |
| Cambridge Lakes Charter School | Pingree Grove, IL | $5,000 |
| Central Middle School | Midland, MI | $2,810 |
| Cheyenne Central High School | Cheyenne, WY | $4,590 |
| Cienega High School | Vail, AZ | $4,730 |
| Cleveland Alternative School | Cleveland, OK | $4,980 |
| Cleveland High School | Cleveland, TN | $4,900 |
| Common Ground High School | New Haven, CT | $15,200 |
| Dunbar Vocational Career Academy | Chicago, IL | $3,940 |
| East Mountain High School | Sandia Park, NM | $4,900 |
| Fontbonne Hall Academy | Brooklyn, NY | $2,780 |
| Fort Dodge Senior High School | Fort Dodge, IA | $1,770 |
| Gahanna Lincoln High School | Gahanna, OH | $5,000 |
| Garrett Morgan Cleveland School of Science Academy | Cleveland, OH | $4,850 |
| Greater Hartford Academy of Mathematics and Science | Hartford, CT | $18,650 |

| | | |
|---|---|---|
| Grovetown Middle School | Grovetown, GA | $1,790 |
| King Philip Regional High School | Wrentham, MA | $2,090 |
| King William High School | King William, VA | $4,920 |
| LeyVa Middle School | San Jose, CA | $5,000 |
| Lincoln Park Middle School | Lincoln Park, MI | $15,000 |
| Linwood Middle School | North Brunswick, NJ | $4,030 |
| Madison Central School | Madison, NY | $16,950 |
| Marjory Stoneman Douglas High School | Parkland, FL | $2,700 |
| Mills E. Goodwin High School | Richmond, VA | $4,990 |
| Mountain Brook High School | Birmingham, AL | $5,000 |
| Mountain View Middle School | Blackfoot, ID | $1,600 |
| Musselman High School | Inwood, WV | $5,000 |
| National Science Teachers Association | Arlington, VA | $50,000 |
| New York Sun Works | New York, NY | $5,000 |
| Noble Street Charter School | Chicago, IL | $3,600 |
| North Allegheny Senior High School | Wexford, PA | $4,310 |
| Odyssey Charter School | Brooklyn Center, MN | $4,880 |
| Orange County Department of Education | Costa Mesa, CA | $5,000 |
| Pickaway-Ross Career & Technology Center | Chillicothe, OH | $15,320 |
| Piner High School | Santa Rosa, CA | $9,870 |
| Roanoke Valley Governor's School for Science & Technology | Roanoke, VA | $29,930 |
| Santa Clara Unified School District | Santa Clara, CA | $4,670 |
| Science Park High School | Newark, NJ | $6,760 |
| Smith-Cotton High School | Sedalia, MO | $4,850 |
| Stuyvesant High School | New York, NY | $20,000 |
| Temple High School | Temple, GA | $12,000 |
| Thornridge High School | Dolton, IL | $7,970 |
| Tri-County High School | Howard City, MI | $4,850 |
| University of California Irvine | Irvine, CA | $15,760 |
| Westminster High School | Westminster, CA | $4,870 |
| Wildlife Conservation Society's New York Aquarium | Bronx, NY | $15,000 |
| William Marsh Rice University | Houston, TX | $20,000 |

Table A14. Featured Grants for Grades 6 – 12 during 2007

| School | Country and State | Grant |
|---|---|---|
| Benjamin Middle School | West Chicago, IL | $5,000 |
| Brazosport High School | Freeport, TX | $1,880 |
| Chaminade College Preparatory | West Hills, CA | $5,000 |
| Clement Middle School | Redlands, CA | $8,180 |
| Coalition for the Upper South Platte | Lake George, CO | $4,950 |

| | | |
|---|---|---|
| Conrad Weiser Middle School | Robesonia, PA | $5,000 |
| Crespi Carmelite High School | Encino, CA | $4,500 |
| Deep Creek High School | Chesapeake, VA | $4,240 |
| Divine Child High School | Dearborn, MI | $9,560 |
| E.O. Smith High School | Storrs, CT | $3,780 |
| Fort Zumwalt North High School | O'Fallon, MO | $2,660 |
| Frankenmuth High School | Frankenmuth, MI | $550 |
| George W. Hewlett High School | Hewlett, NY | $4,110 |
| Gulf Coast Academy of Science and Technology, Inc. | Spring Hill, FL | $4,890 |
| Kaiser High School | Honolulu, HI | $10,500 |
| Kendall Jr. Sr. High School | Kendall, NY | $5,000 |
| Laguna Beach High School | Laguna Beach, CA | $3,000 |
| Linwood Middle School | North Brunswick, NJ | $4,600 |
| Madeira Beach Middle School | Madeira Beach, FL | $8,960 |
| Madison Central School | Madison, NY | $4,700 |
| Mary Queen of the High Rosary School | Lexington, KY | $3,610 |
| Mat-Su Career & Technical High School | Wasilla, AK | $10,790 |
| Memorial High School | Eau Clair, WI | $11,700 |
| MIND Institute | Costa Mesa, CA | $15,000 |
| Mitchell Senior High School | Mitchell, SD | $8,830 |
| National Science Teachers Association | Arlington, VA | $50,000 |
| Navarre High School | Navarre, FL | $4,900 |
| New York Sun Works | New York, NY | $4,500 |
| Orange County Department of Education | Costa Mesa, CA | $5,000 |
| Plaza Vista School | Irvine, CA | $4,920 |
| Ramona Convent Secondary School | Alhambra, CA | $10,000 |
| Redeemer Lutheran School | Oakmont, PA | $3,970 |
| Roland Park Country School | Baltimore, MD | $5,000 |
| Santa Clara Unified School District | Santa Clara, CA | $3,770 |
| Snake River Junior High School | Blackfoot, ID | $5,000 |
| St. Paul's School for Girls | Brooklandville, MD | $9,450 |
| St. Timothy's Episcopal School | Apple Valley, CA | $1,070 |
| Streamwood High School | Streamwood, IL | $10,800 |
| Strough Middle School | Rome, NY | $5,000 |
| Swain County High School | Bryson City, NC | $5,000 |
| Teeland Middle School | Wasilla, AK | $8,000 |
| Terrell Lane Middle School | Louisburg, NC | $10,000 |
| Thornton Township High School | Harvey, IL | $4,050 |
| Tippecanoe High School | Tipp City, OH | $4,290 |
| University of California, Irvine | Irvine, CA | $20,000 |
| Warrenton High School | Warrenton, OR | $15,000 |
| Wildlife Conservation Society | Bronx, NY | $15,000 |

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*Box A4. Examples of exceptional projects funded by TAF*

**Greater Hartford Academy of Mathematics and Science (West Hartford, CT)**
Greater Hartford Academy of Mathematics and Science (GHAMS) received a grant of $18,650 for its hands-on elective course, The Algal BioDiesel Project. Through this project, GHAMS students studied, evaluated, produced and tested alternative (non-petroleum) fuel sources. Using a range of different algae, students tested the relative merits of various fuel sources in a team-based research project. For example, students investigating the efficacy of an alga as a fuel source began by learning how to cultivate algae via aquaculture. Student teams were responsible for monitoring the entire process - from the production of raw materials to testing of the fuel source's ability to power a motor. The project began with a TAF grant in 2006.

**Bard High School Early College II (Queens, NY)**
Bard High School Early College II (BHSEC II) received a grant of $13,440 to create a new inquiry-based physics investigation, which examines how human activity - especially air pollution - may be affecting the local weather and lightning activity.
Bard High School in Queens is the second school established by Bard College (Annandale-On-Hudson, NY) and the New York City Board of Education. The school's early college model draw on the scholarship of Bard President Leon Botstein and his belief that high-school-aged students are young adults whose ambition to learn must be taken seriously. Love of learning dominates the school culture. A rigorous curriculum allows students to fulfill all of the regents' requirements through an engaging and demanding college level education.
With new equipment purchased with their Toshiba America Foundation grant, students studied how urbanization, pollution and the "heat island effect" relate to lightning activity.

Others example can be found on the TAF website:
 http://www.toshiba.com/taf/612_grants.jsp

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## Toshiba/NSTA ExploraVision Awards Competition

There is also a second front, which sees Toshiba and TAF involved. We are referring to the ExploraVision Awards Competition, created and funded by Toshiba almost twenty years ago and administered by the National Science Teachers Association (NSTA). Designed for K–12 students of all interest, skill and ability levels, ExploraVision encourages kids to create and explore a vision of future technology by combining their

imaginations with the tools of science. All inventions and innovations result from creative thinking and problem solving.

Since 1992, more than 270,000 students from across the United States and Canada have competed in ExploraVision. The competition is intended to motivate students and help them learn to convey their knowledge more effectively. Students work in groups of two, three or four, simulating Research and Development teams, and are guided by a team coach and an optional mentor. Each team selects a technology, or an aspect of a technology, which is present in the home, school, or community, or any other technology relevant to their lives. They explore what the technology does, how it works, and how, when, and why it was invented. The students must then project into the future what that technology could be like 20 years from now and determine what scientific breakthroughs need to occur to make it a reality. ExploraVision is a ready-made tool to teach any science discipline.

ExploraVision is administered by the National Science Teachers Association and is a way to incorporate the National Science Education Standards into classes.

As far as the requirements are concerned, each student is limited to one entry per year. However, each teacher/coach can participate in multiple entries per year. Each complete entry must consist of a Toshiba/NSTA ExploraVision Awards Entry Form, an Abstract, the project description, bibliography, five simulated web page graphics.

Concerning the eligibility, all entries must meet the following requirements:

- all entrants must be United States or Canadian citizens or legal residents, living within the United States, U.S. Territories or Canada and enrolled full-time in a public, private or home school;
- students must be no older than 21 years of age;
- National Science Teachers Association employees, NSTA Board Members, ExploraVision Awards judges and their respective families are not eligible to enter the competition;
- any entry that has won at ExploraVision's regional and/or national levels may not be re-submitted in future years;
- any entry previously awarded a prize in another competition may not be submitted;
- any student who was selected as a regional or national finalist in the 1992–2010 ExploraVision Awards can only compete in subsequent years with a new team — i.e., with students who have not previously been selected as ExploraVision Awards regional or national finalists.

There are four categories that can apply for ExploraVision Awards:
• Primary Level (Grades K – 3)
• Upper Elementary Level (Grades 4 – 6)
• Middle Level (Grades 7 – 9)

• High School Level (Grades 10 – 12).

Each category will be judged separately, based on the abilities of students in those grades. Students in a lower grade may be part of a team competing in the next-higher entry category. However, students may not move down to a lower grade-level entry category.

Judging is organized into two different levels: the regional and the national.

The regional judging is organized into six regional areas of the United States and Canada. A judging committee will select 24 teams, one for each grade-level category in each of the six regions. Regional winners will be notified in early March.

The maximum points allocated to each part of the entry is listed below:

- Present technology: 10 points
- History: 10 points
- Future technology: 20 points
- Breakthroughs: 15 points
- Design Process: 10 points
- Consequences: 10 points
- Bibliography: 5 points
- Simulated Web page graphics: 20 points.

Each team must prepare a written description of its project that does not exceed 11 pages. The description may be a combination of text and artwork. It must include the following sections:

*A) Present technology – 10 points*

Give an overview of the present form of the technology, including scientific principles involved in its functioning.

*B) History – 10 points*

Research and describe the history of the technology from its inception.

*C) Future technology – 20 points*

Describe the team's vision for what this technology will be like in 20 years, including scientific principles involved in developing the technology.

*D) Breakthroughs – 15 points*

Research and describe breakthroughs that are necessary to make the future technology design a reality. Describe why this future technology does not exist today.

*E) Design Process – 10 points*

Describe three alternative ideas of features the team considered for their project. The ideas and features should be directly related to the entry, not a list related to other entries submitted in previous years or by other participants. Describe why the team rejected each feature and idea in favor of the ones in the submitted technology.

*F) Consequences – 10 points*

Describe the potential positive and negative consequences of the new technology on society.

Entries will be judged on creativity, scientific accuracy, communication and feasibility of vision. Judges will award higher scores to entries that are different from those that have won previously. To ensure an impartial selection process, the judges do not receive entry forms; and student, teacher and school names do not appear anywhere except on those forms.

There is also the national judging. The 24 regional winning teams will have the opportunity to bring their visions to life. Using their original entries as a guide, each regional winning team creates a website for its future technology, along with a prototype. The web site must relate to the original project description and incorporate at least one video of 2 minutes.

To assist in this process, teams will receive a Toshiba notebook computer with a modem and web design software (this system will be given to the school listed on the entry form as a regional prize and easy-to-follow, step-by-step instructions designed for the beginning computer user with no experience in website design).

Websites will be judged on creativity, originality and the substance of the promotional message (not on the professional quality of the website). Primary and Upper Elementary Level teams may receive additional help from their adult advisors in producing their websites. Mandatory criteria:

• Websites must be able to be viewed within approximately five minutes;
• Website must incorporate at least one original video of one to two minutes;
• Site must relate to the original project description;
• All team members must contribute to the production of the website;
• Website design must feature a prototype of the proposed future technology, shown in drawings, photographs or videos. This may be an actual model or visual representation; it does not have to be a working device; prototypes are not to be submitted with the website.

Websites are due in April. The national judging committee consists of leading science educators, as well as science and technology experts. The committee will review original entries and actual websites and select eight finalist teams (two from each grade-level entry category). The eight finalist teams will be notified in early May. From these finalists, the judges will award four first-place and four second-place prizes at ExploraVision Awards Weekend. Both students and coaches can receive prizes, as illustrated in box A5[7].

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[7] A full list of winners and participants from 2003 up to 2010 is available on the following web sites: http://www.exploravision.org/winners/winner-history.php and http://www.exploravision.org/winners/.

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*Box A5. ExploraVision Prizes*

*FOR STUDENTS*

First Prize (4 teams): U.S. EE Savings Bond worth $10,000* at maturity for each student.

Second Prize (4 teams): U.S. EE Savings Bond worth $5,000* at maturity for each student.

National Finalists: An expense paid trip to Washington, DC in June for ExploraVision Awards Weekend for each national winning student and his/her parents/guardians.

Regional Winners: A Toshiba Camileo Camcorder for each student and an awards ceremony for each regional winning team at its school where the team will receive a winner's banner, plaque and other gifts.

Honorable Mention (500 teams): A unique prize and certificate for each student.

All Participants: A certificate of participation, entry gift and a special discount on Toshiba computer products for every student whose team submits a complete entry.

Student entry certificates and gifts will be sent to the coach for distribution. Coaches are encouraged to submit all completed ExploraVision projects so that every student can be recognized for his or her effort.


*FOR COACHES AND MENTORS*

National Finalists: An expense paid trip to Washington, DC in June for ExploraVision Awards Weekend for the coach and mentor of each national winning team and a one-year NSTA membership to coaches of the national winning teams

Regional Winners: A Toshiba Camileo™ Camcorder for the coach and mentor of each regional winning team

All Participants: A special discount on Toshiba computer products, certificate of participation and an entry gift for each coach and mentor of every team that submits a complete entry.


*FOR SCHOOLS*

Regional Winners: A Toshiba laptop for each of the schools of the regional winning teams.

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## WALLACE FOUNDATION

The Wallace Foundation, nationally recognized for its involvement in educational and cultural programs, traces its origins back a half century to the philanthropic impulses of DeWitt and Lila Acheson Wallace, founders of The Reader's Digest Association. Throughout their professional careers and in later years, DeWitt and Lila Wallace dedicated themselves to improving other people's lives. In the 1950s, they established a group of family philanthropies that evolved in the 1980s into two foundations bearing their names: the DeWitt Wallace-Reader's Digest Fund and the Lila Wallace-Reader's Digest Fund. Together, these philanthropies provided nearly $2 billion in support to a wide variety of artistic, cultural and educational causes. In 2003, the two separate foundations were legally merged and renamed The Wallace Foundation, with headquarters in New York City. In that year the Foundation also completed the decade-long process of divesting all of its Reader's Digest stock, its primary bequest from the Wallaces. Compared with other US foundations, Wallace is still young. It was only in 1990 that the Foundation began to realize significant asset growth and increase the size of its professional staff. Today, its assets total approximately $1.3 billion.

The Foundation focuses today on three areas:

1. Strengthening education leadership to improve student achievement;
2. Improving after school learning opportunities;
3. Building appreciation and demand for the arts.

In each of these areas, the Wallace Foundation believes that the most important contribution is not money, but the ideas and useful lessons that can be captured, synthesized and communicated broadly from the work of the grantee organizations and from research that are commissioned.

Concerning the first area of intervention, after devoting much of the 1990s to working on boosting teacher quality, Wallace in 2000 shifted its focus to boosting education leadership. The idea is that effective leaders are essential to improving public education. The Wallace Foundation's analysis of the field revealed that previous school reform efforts had neglected leadership, that school leader training was weak and ill-suited to modern-day demands, that there existed an enormous knowledge gap about the role leaders could play in improving student learning, and that awareness of that role needed to be raised among educators, policy-makers and the public. The Wallace Foundation also thought change would most likely occur and last if states and districts worked together. This represented a dramatic departure from most reform efforts, which focused primarily on selected schools in a district.

As the initiative developed, the Wallace Foundation's work concentrated on trying to effect change in three areas:

- Standards – to focus on the skills principals need in order to succeed, and to then use that knowledge to influence both licensure and accreditation of leadership preparation programs;
- Training – to provide principals with the skills to manage complex organizational change and to improve teaching and learning throughout schools;
- Conditions – to create the right supports and incentives for principals and superintendents to perform as effective leaders.

States have adopted revised leadership standards that have helped turn the field's discussion from what leaders need to know to what they actually have to do to successfully improve teaching and learning throughout schools. All 14 states where Wallace has worked most closely have adopted an updated set of standards for principals and other school administrators. These revised standards were developed, with Wallace support, by the Interstate School Leaders Licensure Consortium, known as ISLLC, under the aegis of the Council of Chief State School Officers. They are guiding many states and districts in revising licensure requirements and principal training curriculums, re-accrediting university leadership programs and evaluating principal performance.

Applying new research, states and districts are beginning to explore principal training to address longstanding quality weaknesses and provide more continuous support to principals after they are hired. Some 24 training programs in Wallace-supported districts have been identified as high quality by virtue of having used exemplary practices identified in Stanford University research that was commissioned by the foundation. Eighteen of them offer full-time internships, previously an area of weakness for many programs. Wallace-supported school districts including Chicago, Boston and Fort Wayne, Indiana, are exerting more influence on the content, relevance and delivery of principal training at area universities. Two Wallace-supported districts, New York City and Atlanta, have opened innovative leadership academies that employ methods common in other types of professional education, such as role play and case study.

Mentoring, too, has become more prevalent in the field. More than half of all states – and 11 of 14 where Wallace works most closely – now require principal mentoring; practically none did when our initiative began in 2000. Nine of the 11 require mentoring to incorporate the quality criteria identified by Wallace's 2007 publication *Getting Principal Mentoring Right*. Top education leaders in all states now rate the importance of training and mentoring principals highly – 5.9 on a scale of 6 in Wallace states; 5.5 in non-Wallace states.

States and districts have made progress in improving some of the conditions under which school leaders work. Among other things, they have provided school leaders with useful data and tested new ways both to assess principal performance and to increase the amount of time principals devote to improving classroom instruction. Less progress has occurred on conditions requiring difficult political or contractual changes, such as

providing principals with more authority over time, money and people. Key indicators include:

Twelve of the 14 states where Wallace works most closely have enacted laws creating statewide data warehouses, student data management systems and "balanced scorecards," that is, planning tools that use data to assess how well positioned an organization is for the future. These sites have also acted to provide training to leaders in data use. A majority of principals in 10 Wallace-supported states surveyed by the RAND Corporation are satisfied with available data – but dissatisfied with its timeliness.

- Some 315 schools in 10 states are participating in the School Administration Manager (SAM) program, which is designed to enable principals to focus more time on instruction. Some 75 principals in the program at least a year increased the average time they spent on instructional matters by nearly an hour daily.

- Nine of 14 states have passed new principal evaluation laws since the beginning of their grants. To date six have begun to use the Wallace-funded VAL-ED, the first research-based evaluation system focused squarely on instructional leadership.

Since Wallace Foundation began the initiative, education leadership has become more widely accepted as necessary to school reform. Top leaders in 48 states strongly believe leadership is important to improving student achievement: they rate it 5.8 on a scale of 6 in states where Wallace works; 5.5 among leaders in other states. Washington, too, has embraced the idea. U.S. Secretary of Education Arne Duncan has publicly proclaimed the importance of leadership in turning around low-performing schools and has added better leadership to better teaching as a centerpiece of new federal reform priorities.

Today, new leadership standards, revised with Wallace support, are helping to reshape licensure rules and guide improvements in principal preparation programs. New training programs have emerged, built on research that identified and explored the specifics of effective programs. Mentoring is much more common nationwide. Finally, with Wallace support a research-based performance assessment tool, which measures leadership behaviors in school principals, has been developed and is being marketed across the country. One reason for the growing recognition of education leadership may be that more is known about the subject. Over the last decade, more than 70 Wallace-supported publications and other resources have helped fill the knowledge gap about school leadership and how it can work to prepare and support talented teachers.

**Education Leadership Grants & Program**

Education Leadership Grants & Program run by Wallace Foundation: drawing on lessons learned to date about leadership improvement efforts, Wallace has developed a working hypothesis called a "cohesive leadership system." The idea is that in order to achieve widespread, sustainable leadership improvement, state and district policies and practices affecting the standards, training and conditions of leaders should be well-coordinated. A growing body of research, either commissioned or carried out in-house by Wallace, offers a range of new ideas and insights about leadership for learning. Examples:

- *Becoming A Leader: Preparing School Principals for Today's Schools* describes key attributes of effective principal training and offers lessons on how States and Districts can achieve it.
- *Preparing School Leaders for A Changing World*, by Stanford researchers, provides case studies and guidelines for reinventing how principals are prepared for their jobs.
- *Getting Principal Mentoring Right: Lessons from the Field*, analyzes common strengths and shortcomings of state and district mentoring programs and offers guidelines on how they might be improved.
- *How Leadership Influences Student Learning*, by researchers at the Universities of Minnesota and Toronto, establishes the central role of leadership in improving student performance.

## WTGrant FOUNDATION

The mission of the WTGrant Foundation is to supporting research to improve the lives of young people. As a private grantmaking institution, the Foundation currently funds high-quality empirical research, with the ultimate aim of improving the lives of youth ages 8 to 25 in the United States. In 2008, the WTGrant Foundation awarded grants totaling more than $11 million to researchers, policymakers, and practitioners invested in the future of U.S. youth.

*Lines of activity:*

The WTGrant current research interests are understanding and improving social settings such as families, schools, peer groups, and organizations, and studying how these social settings affect youth. Foundation's interests also focus on when, how, and under what conditions research evidence is used in policy and practice that affect youth, and how its use can be improved.

To a more limited extent, the Foundation supports capacity-building, communication, and advocacy activities. These awards are meant to support and leverage our primary focus on research. The Youth Service Improvement Grants program supports activities conducted by nonprofit community-based organizations in the New York metropolitan area to improve the quality of services for young people ages 8 to 25.

*Main programs:*

- Investigator Initiated Grants: this program supports high-quality empirical studies that are consistent with our Current Research Interests.
- RFP for the Development and Improvement of the Measurement of Classroom Quality: this RFP, issued jointly with the Spencer Foundation, is one element of the broader effort to build theory and evidence about how classrooms affect youth and how to improve those effects.
- RFP for Understanding the Acquisition, Interpretation, and Use of Research Evidence in Policy and Practice: this RFP is designed to help us better understand the acquisition, interpretation, and use of research evidence in policy and practice that affect youth.

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*Box A6 - Examples of Grants in RFP for Classroom Measurement*

**Assessing Instructional Content and Interactions At-Scale**
Richard Correnti, Ph.D.
Lindsay Clare Matsumura, Ph.D.
University of Pittsburgh
Laura Hamilton, Ph.D.
RAND Corporation

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149

$499,789
2008–2009

Information on instructional content, taken from teacher logs and ratings of teacher assignment quality, can be used separately to predict differences in student achievement. With this grant, Correnti and his team will combine the use of these two measures in an attempt to assess the "instructional core" of a classroom (i.e., what content is taught and how it is delivered to students) and predict student performance on a state-administered test and an essay writing task. This three-pronged project will explore: (1) the relationship between the instructional core and student achievement; (2) the feasibility of using this measurement approach on a large scale; and (3) the contextual factors, such as opportunities for professional development, that influence the instructional environment within a school and influence student-teacher interactions. Correnti and his team will focus on literacy instruction in 120 4$^{th}$ and 5$^{th}$ grade classrooms.

**Teaching Practices, Classroom Peer Ecologies, and Youth Outcomes**
Scott Gest, Ph.D.
Thomas Farmer, Ph.D.
D. Wayne Osgood, Ph.D.
Pennsylvania State University
Philip Rodkin, Ph.D.
University of Illinois, Urbana-Champaign
$499,209
2008–2011

Can researchers create cost-effective measures to assess how teacher practices are related to student norms regarding academics, or which students are seen by their peers as leaders? Do such features of the peer group predict academic and behavioral outcomes? How might such a measure provide us with more information on understanding classroom quality than is currently obtained from teacher surveys and classroom observation? The team is using a sample of 72 1st, 3rd, and 5th grade classrooms in 18 schools serving 1,600 youth in central Pennsylvania and Illinois. The schools vary in their ethnic heterogeneity, allowing the researchers to examine the influence of ethnic diversity on peer networks in classrooms.

**Toward an Understanding of Classroom Context: A Validation Study**
Drew Gitomer, Ph.D.
Courtney Bell, Ph.D.
Educational Testing Service

$663,868
2008–2011

The Classroom Assessment Scoring System (CLASS) is a promising observational instrument that measures student-teacher classroom interactions in elementary school classrooms. Gitomer and Bell will use this grant to test the validity of the CLASS-S— an altered version of the CLASS meant for use in secondary school classrooms. They will also assess different ways to implement the CLASS, seeking to optimize its efficiency. They will gather data in 150 8th and 9th grade algebra classrooms using 3 different strategies for completing the CLASS: the conventional observation by a classroom rater, video recording of classrooms to allow for off-site coding, and teacher self-assessment. For the validity analyses, the researchers will collect measures of teacher and student characteristics, teachers' math knowledge for teaching (MKT) and teachers' knowledge of instructional support. The team will compare CLASS and other scores to the changes in student scores on a standardized algebra test.

**Making a Difference: Examining Classrooms Practices in Middle School English Language Arts**
Pam Grossman, Ph.D.
Susanna Loeb, Ph.D.
Stanford University
$235,558
2008–2010

Is it possible to identify and accurately measure the instructional practices of middle school English/language arts classrooms that predict classroom effects on student achievement? With this grant, Grossman and Loeb will test an observational measure of English/Language Arts instruction that they have developed to supplement the CLASS system. The measure, Protocol for Language Arts Teaching Observation (PLATO), includes 10 dimensions of instruction. Building on an initial pilot that incorporated classroom observations, teacher logs, and student work samples, the team will expand their observational study to a sample of 220 6th–8th grade English/language arts teachers in New York City. The analysis will focus on instructional practices that predict teachers' impact on changes in student achievement.

**Improving the Measurement of Classroom Mathematics Instruction**
Heather Hill, Ph.D.
Harvard Graduate School of Education
Robin Jacob, Ph.D.
University of Michigan Institute for Social Research
Geoffrey Phelps, Ph.D.

University of Michigan School of Education
$500,000
2009–2012


Hill and her research team have been developing a video observation protocol that assesses the teaching of mathematics, and they will use this grant to make it more user-friendly, reliable, and accurate. The grant will focus on improving how the protocol measures teacher and student interactions with mathematical content, and the interactions between teachers and students regarding mathematical content. To refine and improve their measure of the "Mathematical Quality of Instruction" (MQI), the research team will capitalize on data they are collecting in an intervention trial meant to improve math teaching. To assess the accuracy of their protocol, the team will calculate how well it predicts change in student performance on a state test.

**Measuring Quality Assessment in Science Classrooms through Artifacts and Self-Report**
Jose Felipe Martinez, Ph.D.
UCLA Graduate School of Education & Information Studies
Hilda Borko, Ph.D.
Stanford University
$493,469
2009–2011


Martinez and Borko will test the reliability and validity of a measure of "Quality Assessment" in middle school science that combines use of classroom artifacts and teacher and student surveys. As outlined in the NRC model for the National Science Education Standards, "Quality assessment" involves setting goals, assessing students, and using the information collected to adapt instructional practices and promote learning. Trained raters will assess notebooks compiled by 40 8th grade science teachers containing assessment-related materials (such as lesson plans, assignments, quizzes, and exams) teacher feedback, and survey data from teachers and students. The researchers will investigate whether ratings of quality assessment based on notebooks are consistent across raters, science topics, and time; and whether they provide overlapping information about assessment practice, compared with teacher and student surveys. Additional analyses will investigate whether notebook ratings predict student achievement on the California Standards Test in Science.

# INSTITUTE OF EDUCATION SCIENCES

The Institute of Education Sciences (IES) is the research arm of the U.S. Department of Education, and by law its activities must be free of partisan political influence. The mission of the IES is to provide rigorous and relevant evidence on which to ground education practice and policy and share this information broadly. By identifying what works, what doesn't, and why, the IES aims to improve educational outcomes for all students, particularly those at risk of failure.

The work of the Institute is carried out through our four Divisions:
- the National Center for Education Research,
- the National Center for Education Statistics,
- the National Center for Education Evaluation and Regional Assistance (evaluation of big deal federal programs, such as "Reading first"), and
- the National Center for Special Education Research.

Established under the Education Sciences Reform Act of 2002, IES operates with the counsel and oversight of the National Board for Education Sciences. With a budget of over $200 million and a staff of nearly 200 people, IES has helped raise the bar for all education research and evaluation by conducting peer-reviewed scientific studies, demanding high standards, and supporting and training researchers across the country. IES funds top educational researchers nationwide to conduct studies that seek answers on what works for students from preschools to postsecondary, including interventions for special education students. IES collects and analyzes statistics on the condition of education, conducts long-term longitudinal studies and surveys, supports international assessments, and carries out the National Assessment of Educational Progress, also known as the Nation's Report Card. It conducts evaluations of large-scale educational projects and federal education programs –which soon will include examining reforms driven by the American Recovery and Reinvestment Act. The IES helps states work toward data-driven school improvement by providing grants for the development and use of longitudinal data systems. Finally, the Institute informs the public and reaches out to practitioners with a variety of dissemination strategies and technical assistance programs, including: the What Works Clearinghouse; the ERIC education database; ten Regional Educational Laboratories; national Research and Development Centers; and through conferences, publications and products.

In particular, the **What Works Clearinghouse** *(http://ies.ed.gov/ncee/wwc/)* summarizes what is known about education, in a non-ideological way. The WWC is a central and trusted source of scientific evidence for what works in education.

IES' research agenda is informed by the voices and interests of practitioners and policy makers, who are involved in shaping the questions most relevant to their practice. The IES seeks to build the capacity of states and school districts to conduct research, evaluate their programs and make sense of the data they are collecting. The Institute strives to develop a greater understanding of schools as learning organizations and study how development, research, and innovation can be better linked to create sustainable school reforms.

See especially the Report: *Helping Students Navigate the Path to College: What High Schools Can Do*, which points out that access to higher education remains a challenge for many students who face academic and informational barriers to college entry. This guide targets high schools and school districts, and focuses on effective practices that prepare students academically for college, assist them in completing the steps to college entry, and improve their likelihood of enrolling in college.

Other useful materials: see the **Urban Institute**, they publish reports on philanthropies, and see also the **Centre for effectiveness of philanthropy** and the **Grant Makers for Education.**

## MDRC POLICY RESEARCH

Created in 1974 by the Ford Foundation and a group of federal agencies, MDRC is best known for mounting large-scale evaluations of real-world policies and programs targeted to low-income people. MDRC helped pioneer the use of random assignment — the same highly reliable methodology that is used to test new medicines — in the evaluation of such policies and programs. In some cases, MDRC works with others to design pathbreaking initiatives and then subject those initiatives to rigorous testing. In other cases, MDRC conducts careful evaluations of programs designed and operated by government agencies or others.

Over the years, MDRC has brought its unique approach to an ever-growing range of policy areas and target populations. Once known primarily for evaluations of state welfare-to-work programs, today MDRC is also studying public school reforms, employment programs for ex-prisoners and people with disabilities, and programs to help low-income people succeed in college. MDRC has worked in nearly every state and most major cities; it also helped create a sister organization in Canada and is currently managing a large project in the United Kingdom with British partners. From welfare policy to high school reform, MDRC's research has frequently helped to shape legislation, program design, and operational practices across the country.

The five main policy areas in which MDRC works include:

- ▪ Promoting Family Well-Being and Child Development
- ▪ Improving Public Education
- ▪ Promoting Successful Transitions to Adulthood
- ▪ Supporting Low-Wage Workers and Communities
- ▪ Overcoming Barriers to Employment.

## Talent Development

One of the major front in which MDRC has been involved in 2005 has been the "Talent Development". The Talent Development model is responsive to the challenge of helping young people make healthy transitions from middle to high school and through high school to graduation. The model, developed by the Center for Research on the Education of Students Placed at Risk (CRESPAR) at Johns Hopkins University, is part of a larger trend in educational reform that aims to improve student performance and engagement through major changes to both the organizational structure and educational processes of middle and high schools.

The Talent Development model for high schools encompassed five main features: small

learning communities (a Freshman Academy and career academies for students in the upper grades); curricula leading to advanced English and mathematics coursework; academic extra-help sessions, including "catch-up" reading and math courses for ninth-graders; staff professional development strategies; and parent and community involvement in activities that foster students' career and college development.

The middle school model included a systematic reorganization of each school into small learning communities; academic courses in English, language arts, mathematics, science, and U.S. history that are based on nationally recognized standards; professional development for teachers on the use of the curriculum and accompanying instructional practice; curriculum coaches to help support teachers on an ongoing basis; and catch-up opportunities during the school day to students who are struggling with mathematics or reading.

The Talent Development evaluation focused primarily on five large, non selective, comprehensive high schools and nine middle schools that implemented the model in the school district of Philadelphia. The primary data sources for the evaluation include student school records and transcripts, annual surveys of students and teachers, and field research activities including school observations and interviews with principals, teachers, and Talent Development organizational facilitators and curriculum coaches.

MDRC released a final report on the Talent Development High School model in May 2005 showing that Talent Development produced substantial positive effects on attendance, academic course credits earned, tenth-grade promotion, and algebra pass rates for students in very low-performing schools in Philadelphia.

## MATHEMATICA POLICY RESEARCH

In 1968, the organization that eventually became Mathematica Policy Research was established to implement the nation's first major social research experiment, the New Jersey Negative Income Tax Experiment. This project, which tested work incentives for welfare recipients, was the first of many efforts to study new policies and ways of trying to answer questions about their effectiveness. As a pioneer in developing the research methodology needed to evaluate policy alternatives, Mathematica helped lay the cornerstone for an emerging field. We have been in the forefront of social policy evaluation and development ever since.

In early 1995, Mathematica formed a new research affiliate, the Center for Studying Health System Change (HSC), which provides objective analyses of how the country's changing health care system affects individuals and families.

In 2007, the company launched the Center for Studying Disability Policy to inform disability policy formation with rigorous, objective research and data collected from the people disability policy aims to serve. In early 2008, we created the Center for Improving Research Evidence to identify, assess, and disseminate results from high quality, rigorous research. The center also provides evaluation technical assistance to support a growing national and international research base and aid decision makers who face a broad array of choices.

Today, the company has over 650 employees working in six locations—Princeton, NJ, Ann Arbor, MI, Cambridge, MA, Chicago, IL, Oakland, CA, and Washington, DC.

Mathematica is owned by its employees. When employees own a company, their shared corporate vision creates opportunities and incentives, spurs creativity, and increases productivity and retention, which all help support long-term effectiveness and growth.

Mathematica's ownership culture originated in 1986 when a group of employees purchased the company from its corporate parent. Being an independent, employee-owned firm empowered us to define and further its mission; it also enhanced quality and accountability as well as the financial strength of the company. That vision solidified in 2005 with implementation of an Employee Stock Ownership Plan (ESOP), a retirement plan, through which employees' accounts are allocated shares of company stock. Mathematica is 100 percent employee owned. The value of employee plan holdings has increased in tandem with the company's growth and financial strength.

Mathematica strives to improve public well-being by bringing the highest standards of quality, objectivity, and excellence to bear on the provision of information collection and analysis to our clients. The core values that guide its work are:

- Uncompromising objectivity and quality
- Integrity in our interactions with clients and employees
- A supportive and collegial working environment in which employees can pursue fulfilling careers.

*Education Policy Research at Mathematica*

Scientifically based methods are the hallmark of our work evaluating education programs and studying education policy issues. Mathematica's studies cover early learning experiences as well as education in the K-12 grades and college years. They have provided important counsel to policymakers as they seek ideas for improving American education. The Company has also played an important role in advancing the state of the science in education research.

In the education field mathematica is involved on 11 fronts:

1. Rigorous Research Methods and Reviews

"Educators are faced with a bewildering array of choices in curricula, instructional approaches, and student services. Scientifically based research can help them by supporting better decisions. Mathematica plays an important role in advancing the rigor of education research. For the Institute of Education Sciences of the U.S. Department of Education, we run the What Works Clearinghouse, which offers educators and researchers a central and trusted source on what works in education. We also provide technical assistance and review of randomized controlled trials of education interventions, as well as peer review of studies by the Regional Educational Laboratories. Our staff produce reports on important methodological topics, such as sample sizes needed to achieve statistical power in education experiments with clustered designs, relative accuracy of nonexperimental and experimental designs, and control group contamination's effect on estimates of program impacts."

2. Teacher Quality and Compensation

"School quality depends on attracting the best teachers, helping them improve their skills, and retaining them. We evaluated Teach For America (TFA), an initiative that steers graduates of top colleges into the nation's poorest districts, in elementary schools, finding that students of TFA teachers made stronger gains in math than students of other teachers. We are now evaluating TFA and the Teaching Fellows programs in middle and high schools. To determine whether high-intensity teacher induction can help struggling schools hold on to their best new teachers, we are conducting a randomized

experiment involving 1,000 teachers in 400 schools from 17 high-poverty school districts around the country. We have also studied the impact of alternative routes to the classroom. One study examined teacher preparation programs that allow educators to enter the classroom before completing teacher training coursework, finding no impact on achievement. We also studied alternative certification through a portable credential based on teacher exams. Our studies of teacher compensation reform, such as performance-based pay and career ladder bonuses, are shedding light on how to recruit and retain top teachers in high-need schools. In addition, we are assessing whether high-performing teachers can be compensated to move to low-performing schools and whether moving them improves achievement."

As regard teacher compensation programs, the Teacher Advancement Program (TAP) aims to retain effective teachers by offering opportunities to earn higher salaries and career advancement without leaving the classroom. Under this model, teacher pay and advancement are tied to student achievement growth, observed performance in the classroom, and qualification in high-demand subjects. Mathematica is conducting a five-year impact evaluation of TAP as implemented in the Chicago Public Schools. This study is the first to assess the impact of a TAP using random assignment.

Mathematica also evaluated the Missouri Career Ladder Program. This initiative provides opportunities for teachers to qualify for additional pay through a combination of performance and additional duties, such as mentoring or tutoring. Policymakers hope this improves academic services, programs, and student learning outcomes, in part by attracting and retaining effective teachers.

In addition, Mathematica is conducting a five-year study to determine whether children in low-performing schools can benefit from high-performing teachers transferring to their schools. The Talent Transfer Initiative offers teachers $20,000 to transfer to the lowest-performing schools in their districts.

Without better information on how to improve student achievement, many educators and policymakers feel that increased pay incentives may not be sufficient to drive improvement. Mathematica's study of the Effective Practice Incentive Community (EPIC), developed by New Leaders for New Schools, is helping the highest performing teachers in the highest performing schools to identify practices that may contribute to student achievement.

3. Value-Added Methods

"To track students' achievement over time and their readiness for postsecondary success, schools need precise, objective tools. Detailed information on academic growth can also help guide decisionmaking on student instruction. We are a national leader in

calculating, analyzing, and interpreting measures of student achievement growth in ways that are useful to educators. Our value-added models, which document individual student achievement from one year to the next, are designed to be technically sound, flexible, transparent, and responsive to stakeholders' concerns. Mathematica helps districts refine, compare, and combine measures of teacher effectiveness based on both value-added and classroom observations. We translate the results of growth models into language and graphics that district administrators and educators can use. "

4. Curricula and Computers in the Classroom

"Reading and math skills are critical foundations, yet many children struggle to acquire them. Further, teachers are faced with conflicting advice from experts about how best to teach these skills. We evaluated the effectiveness of remedial programs to inform the debate about how best to help struggling readers, finding that programs improved some skills but not test scores. We are also looking at approaches for teaching reading comprehension strategies to fifth graders and conducting a large-scale rigorous study to evaluate early elementary math curricula that show promise for improving achievement in disadvantaged schools. Furthermore, although computers are common in classrooms, little is known about technology's effectiveness in improving learning. Our random assignment study to learn how well technology works to improve math and reading skills showed that most products did not affect test scores."

5. School Choice and Charter Schools

"To address diverse educational needs and encourage schools to continually improve, policymakers have expanded options available to parents. Mathematica is a leader in evaluating school choice programs. We have examined impacts of school vouchers in student attendance, achievement, and other factors. In addition, we are conducting a rigorous national evaluation of the effectiveness of charter schools, including KIPP Academies and networks of schools affiliated with charter management organizations."

6. College Access

"Not everyone has the same preparation for and access to college. We evaluated Upward Bound and Talent Search, two national programs that prepare economically disadvantaged students to enter and succeed in college. We also examined Upward Bound's math and science initiative, designed to strengthen the skills of disadvantaged high school students and encourage them to pursue postsecondary degrees and careers in these fields. Mathematica is evaluating initiatives such as Roads to Success, designed to improve postsecondary and career planning and outcomes for disadvantaged students."

## 7. Career-Focused Education

"Helping students develop the skills, knowledge, and habits they need to prepare for postsecondary programs, jobs, and successful careers is a critical challenge for today's educators. Mathematica has conducted a variety of studies examining issues and initiatives related to career-focused education. We assess the effectiveness of programs in reducing dropout rates and improving other outcomes, examine efforts to improve curricula, help identify career-related challenges for students leaving high school, and evaluate other efforts to enhance career-focused programs."

## 8. At-Risk Youth

"As a nation, we cannot afford to leave any segment of our population behind. Mathematica has been in the forefront of identifying ways to address the educational needs of at-risk youth. We conducted case studies of dropout recovery programs that help youth ages 16 to 21 return to school, earn a high school credential, and prepare for further education and jobs. We also evaluated efforts to raise achievement, reduce dropout rates, and help at-risk students prepare for postsecondary education and productive careers."

## 9. School Leadership

"School principals have been understudied despite the fact that their skills and experience relate to school quality and improvement. Information on their retention and mobility is critical to understanding their career paths. In a multi-mode survey, the first of its kind, we are using paper questionnaires, the web, and telephone interviews to collect information from 1,200 principals who have moved from one school to another. In another survey, we are using computer-assisted telephone interviewing to collect information from 1,200 principals who have left their principal positions."

## 10. After-School Initiatives

"What students do after school has long been a source of national concern. Our study of after-school programs showed that they changed where and with whom students spent some of their after-school time and increased parental involvement in school activities. But it also revealed that programs had a limited influence on academic performance."

## 11. Academic and Non-academic Competencies

"The use of test scores to measure performance has heightened an old debate about which competencies students should develop. To shed light on this issue, Mathematica

estimated effects of math and reading achievement and other competencies on postsecondary earnings and educational attainment."

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