STEM Pathways Student Survey for 2014-15 School Year

Summary of results

STEM Pathways aims to increase youths' long-term interest, learning, and achievement in STEM through a deliberate and interconnected system of STEM learning opportunities. In fall 2014 and spring 2015, a survey was administered to fourth- and fifth-grade students at the six STEM Pathways schools in Minneapolis Public Schools (MPS). Most of the survey items were the same in the fall and spring, permitting analysis of changes in students' responses to the items from the beginning to the end of the 2014-15 school year. The survey assessed students' STEM awareness, attitudes, interests, and activities. Changes in students' responses in these areas from fall to spring may be associated with participation in STEM Pathways. However, caution is needed in attributing them to STEM Pathways because other STEM experiences students may have had in and out of school during the same period could have contributed to the changes as well.

Of 829 eligible fourth and fifth graders from the six STEM Pathways schools, 705 completed all or most of the survey in both the fall and spring for a response rate of 85 percent. Of the 705, 353 were fourth graders and 352 were fifth graders. Results for the 16 close-ended survey items included in both the fall and spring surveys are the subject of this report and are summarized below. The closed-ended items were a series of statements with the response options: agree a lot, mostly agree, agree a little, don't agree, and don't know. Those who agreed a lot or agreed mostly were considered to be in agreement with an item.

Differences in survey results were examined by grade and by student demographic characteristics: gender, eligibility for free- or reduced-price lunch (an indicator of students' family income), English Language Learner (ELL) status, and race/ethnicity (white students, students of color).

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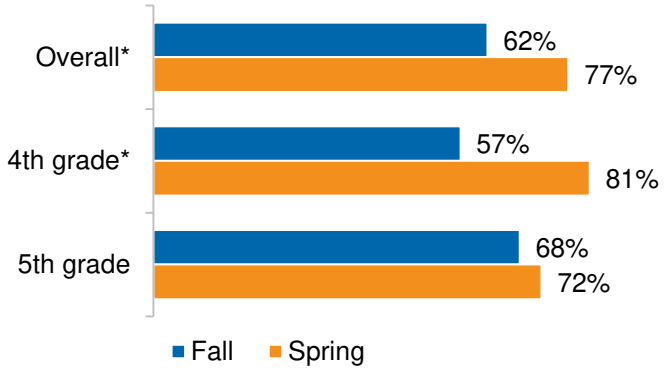
Promising results

STEM interest and application

Interest in engineering ("I like learning engineering") increased overall from fall to spring. This increase occurred primarily among fourth graders. The increase appeared to be due to increased knowledge or understanding of what engineering is as "don't know" responses from fourth graders went down sharply from fall to spring while "agree a lot" responses went up very strongly. The share of fifth-graders who indicated having interest in engineering did not change significantly from fall to spring, with a quite high percentage of the students agreeing with the statement at both times. Perhaps related to this, agreement with the statement, "I think like an engineer to design solutions to problems," increased among fourth graders from fall to spring (from 50% to 58%). Boys showed more interest in engineering than girls, but the interest of both groups increased from fall to spring. The interest in engineering of all other demographic groups examined increased from fall to spring as well.

1. I like learning engineering

Percent of students who "agree a lot" or "mostly agree"



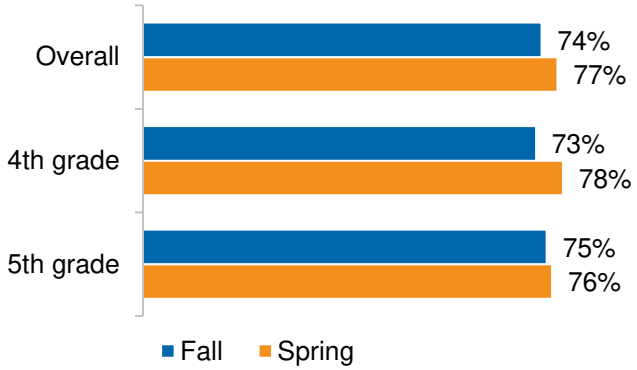
** The change in the percentage of students responding "agree a lot" or "mostly agree" to the survey item from fall to spring was statistically significant (p<.05)*

Note: *Survey response options were: "agree a lot," "mostly agree," "agree a little," "don't agree," and "don't know."*

Interest in STEM as a whole increased among fourth graders from fall to spring (i.e., the percentage of fourth graders agreeing a lot or mostly agreeing with the statement, "I like learning STEM," increased from 73% to 78%). This increase occurred especially among boys and ELL students. There were not significant difference in fifth graders who agreed a lot/mostly agreed with the statement between fall and spring, with three-quarters of the students agreeing with the statement both times (75% in fall and 76% in spring).

2. I like learning STEM

Percent of students who "agree a lot" or "mostly agree"



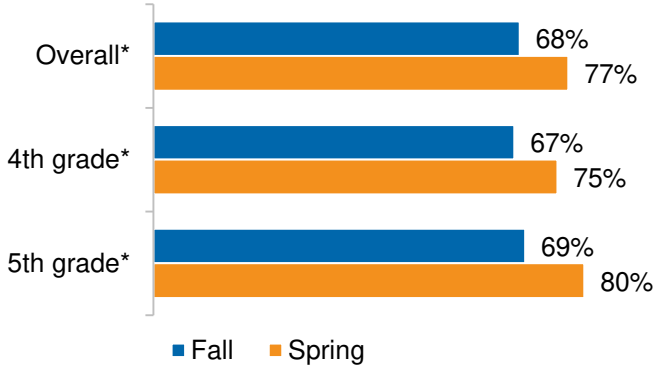
Overall, interest in other STEM subjects (math, science, and technology) did not change significantly from fall to spring. These results might still be viewed as favorable because over three-quarters of the students already liked learning these subjects at the time of the baseline survey in the fall. Despite the lack of changes overall, interest in science and technology increased among boys from fall to spring.

STEM relevance and awareness

Students' belief that STEM knowledge is important to their futures increased from fall to spring. This increase occurred across grades and across almost all student demographic groups examined.

3. STEM knowledge is very important to my future

Percent of students who "agree a lot" or "mostly agree"



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Note: *Survey response options were: "agree a lot," "mostly agree," "agree a little," "don't agree," and "don't know."*

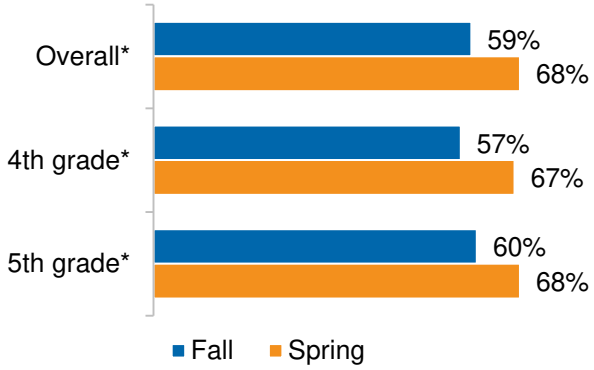
Students' awareness of STEM ("I notice STEM in the world around me every day") also increased from fall to spring (i.e., the percentage of students agreeing a lot or mostly with this statement increased from 54% to 59%). This increase primarily occurred among fourth graders (from 52% to 61%) and among students of color.

Knowledge of STEM careers

Knowledge of STEM jobs ("I know about many jobs that use STEM") increased from fall to spring in both fourth and fifth grades. This increase occurred in most of the student demographic groups examined.

4. I know about many jobs that use STEM

Percent of students who "agree a lot" or "mostly agree"



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Note: *Survey response options were: "agree a lot," "mostly agree," "agree a little," "don't agree," and "don't know."*

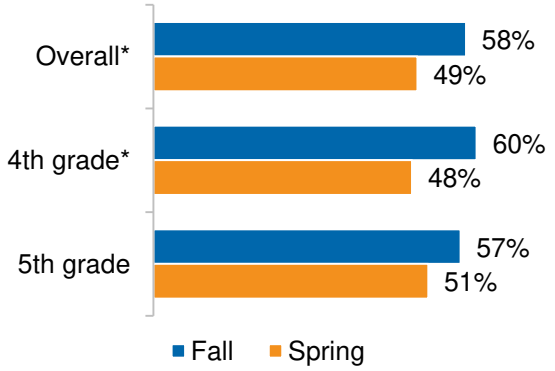
Challenges and possible opportunities for growth

Confidence in STEM abilities

Confidence in STEM abilities ("I am really good at STEM") decreased from fall to spring. Fourth graders had a bigger decrease than fifth graders, with more fourth graders being less sure of their STEM abilities in the spring (i.e., more responding "don't know" to the survey item). Student demographic groups with decreases in their STEM confidence levels were girls, lower-income students, ELL and non-ELL students, and students of color.

5. I am really good at STEM

Percent of students who "agree a lot" or "mostly agree"



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Note: *Survey response options were: "agree a lot," "mostly agree," "agree a little," "don't agree," and "don't know."*

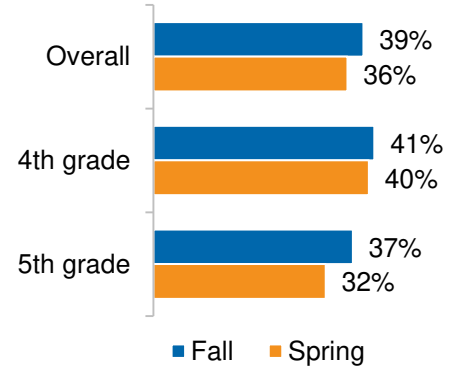
Despite the decrease in agreement with the statement, "I am really good at STEM," agreement with the statement, "I would be good at a job that uses STEM," did not change significantly from fall to spring (slightly over 50% agreed at both time points). Females, low-income students, and students of color tended to be less confident that they would be good at a STEM-related job compared to their demographic counterparts.

Participation in STEM activities outside of school

The proportion of students engaging in frequent STEM-related activities outside of school did not change significantly from fall to spring in either fourth or fifth grade. The proportion of ELL students participating frequently in such activities declined from fall to spring (from 45% to 32%).

6. I frequently do STEM-related activities outside of the school day

Percent of students who "agree a lot" or "mostly agree"



Note: *Survey response options were: "agree a lot," "mostly agree," "agree a little," "don't agree," and "don't know."*

Slightly fewer than half of the students in both the fall and spring agreed that they knew about many STEM-related activities outside of school. The only demographic group to have an increase in agreement with this item from fall to spring was white students.

Over 60 percent of the students in both fall and spring agreed that they would like to do more STEM-related activities.

Application of technology

Applying technology to problem-solving ("I use technology to solve problems") did not change from fall to spring with 56 percent of all the students agreeing with this item at both time points.

Interest in STEM careers

There was little change from fall to spring in students' interest in having a job that uses STEM when they are older, with slightly over half agreeing with this item at both time points. Higher income students were more likely to have an interest in such a job.

Future plans for the student survey and the study

Another cohort of fourth graders will be added to the study in 2015-2016. These students will be asked to complete a similar survey in fall and in spring along with the fifth grade students who participated in STEM Pathways program as fourth graders in 2014-2015. Data will be analyzed by students' demographic characteristics, grade, and the intensity of their participation in STEM Pathways programming. This survey, along with student academic performance data and interviews and surveys with STEM Pathways partner organizations, Minneapolis Public Schools teachers, and leaders, will be used to assess the implementation and outcomes of STEM Pathways

STEM Pathways is a partnership of Minneapolis Public Schools, Minnesota Department of Education, The Bakken, The Bell Museum of Natural History, MN Zoo, STARBASE Minnesota, and The Works.

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For more information

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AUGUST 2015