



Inquiry-based Project Holden Elementary

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Principal Internship

Purpose of Internship

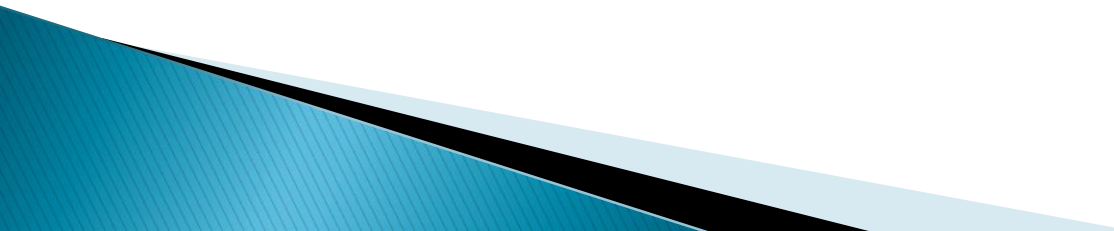
- ▶ To identify a school challenge and use research-based pedagogical practices to engage in inquiry-based learning in order to demonstrate integral leadership skills and competencies to meet the needs of my school community.



Holden Elementary: Needs Assessment

- ▶ Use of inquiry-based instruction is part of a five year plan at Holden Elementary to improve students' academic growth.
- ▶ Teachers have already had two years of professional development on inquiry-based instruction.
- ▶ Important to get staff 'buy in' with the next phase
- ▶ Teachers were given a survey to complete
- ▶ Results of the survey will help us shape the next step for continuous implementation of inquiry-based instruction in science and social studies

Purpose for Developing the Survey

- ▶ Used to determine the impact of previous professional development
 - ▶ Teacher attitudes and beliefs regarding inquiry-based instruction
 - ▶ Determine impact of inquiry-based learning strategies on teaching instruction
 - ▶ Determine impact of inquiry-based learning strategies on student learning
 - ▶ Identify what the teachers need in order to continue to implement inquiry-based instruction
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Data Collection

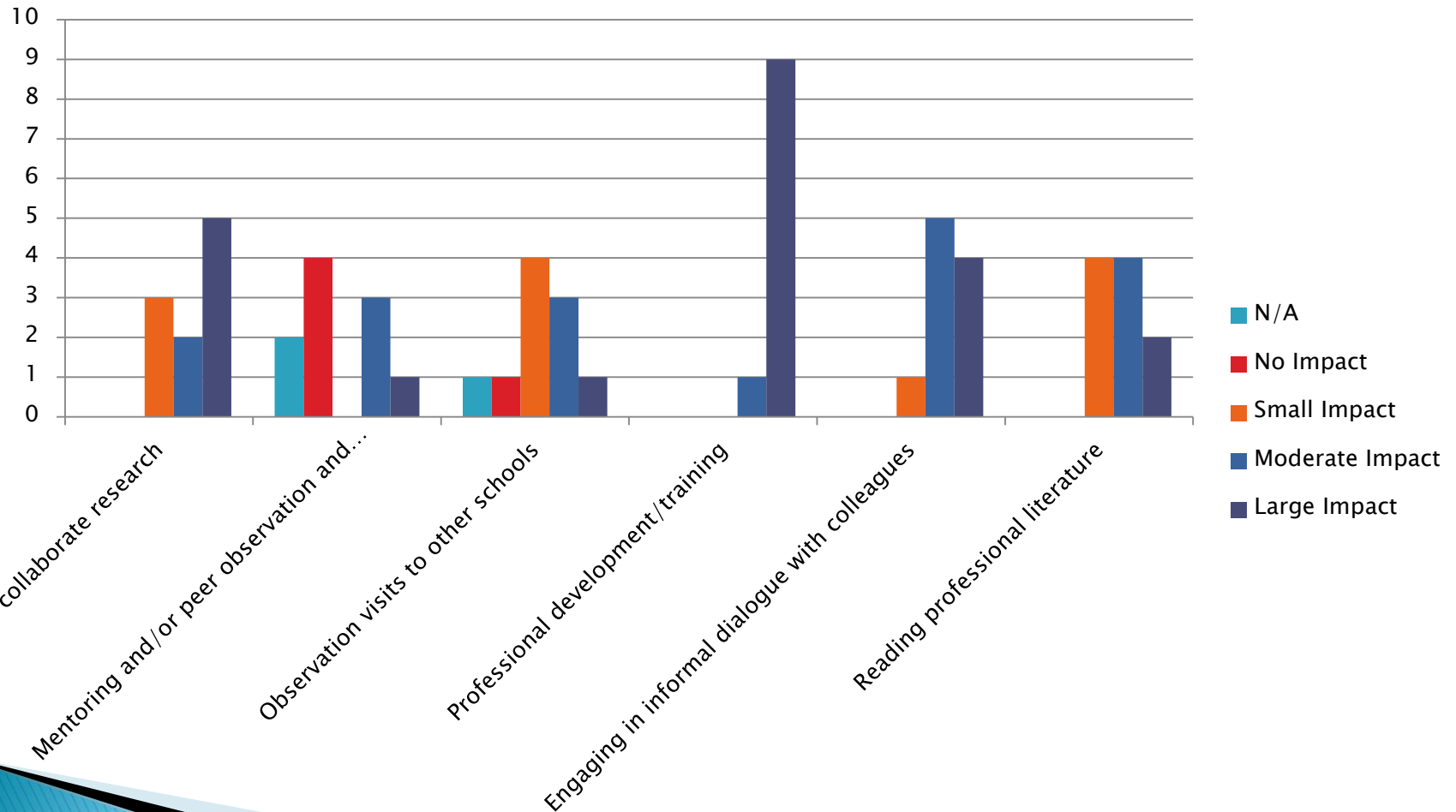
- ▶ A survey was distributed to all of the teachers in order to determine “next steps” to ensure continuous implementation of inquiry-based instruction in science and social studies

- The Survey



Survey Results

1. During the last two years, what kind of professional development activities had the most impact on developing inquiry-based learning in your classroom?



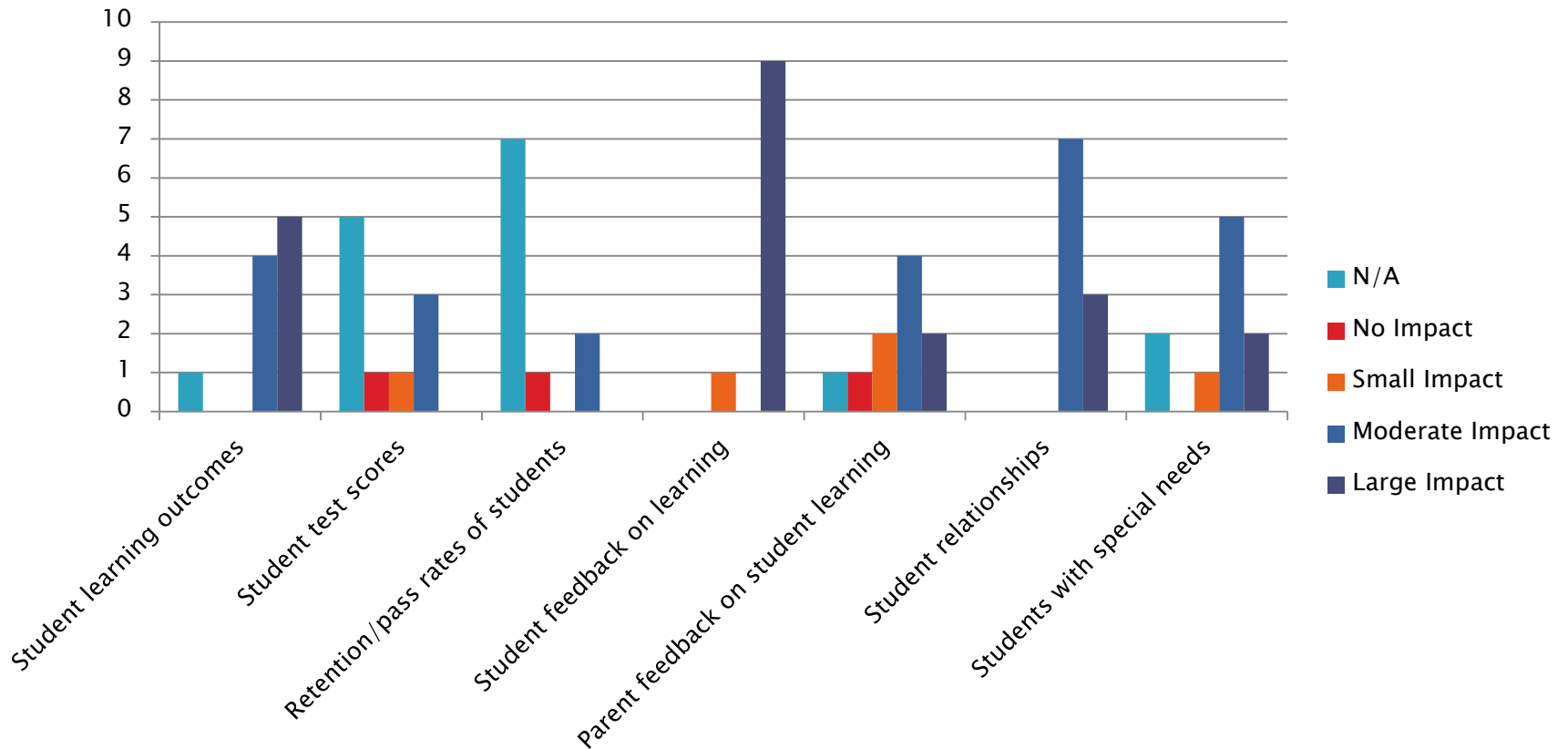
Survey Results: Graph 1 summary

- ▶ Professional development/training had the largest impact on teachers developing inquiry-based learning (90%)
- ▶ Individual or collaborate research (50%)
- ▶ Engaging in informal dialogue with colleagues (40%)



Survey Results

2. Please rate how inquiry based learning impacted the learning of the students in your classroom



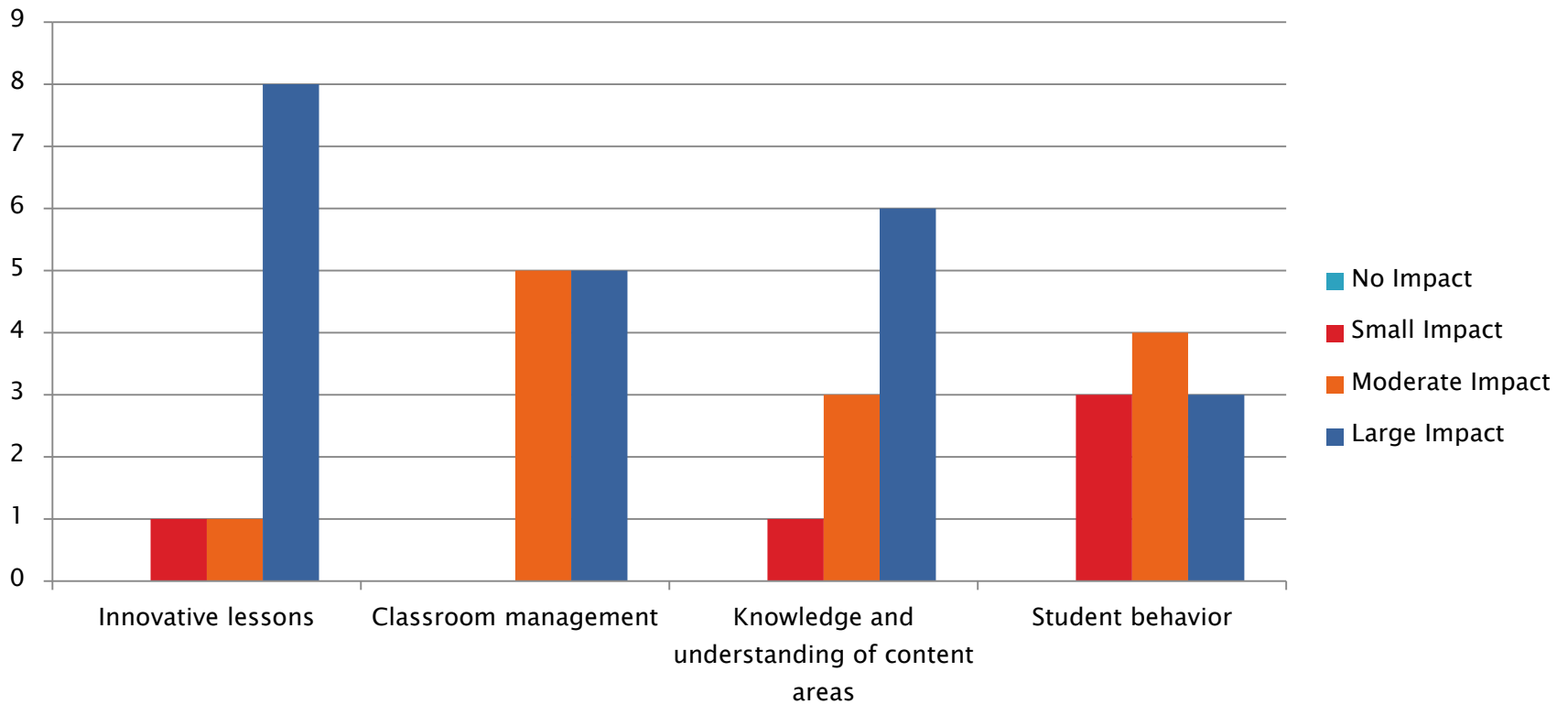
Survey Results: Graph 2 summary

- ▶ The greatest impact of inquiry-based learning was student feedback on learning (90%)
- ▶ Students learning outcomes (50% large impact, 40% moderate impact)
- ▶ Student relationships (30% large impact, 70% moderate impact)
- ▶ Students with special needs (20% large impact, 50% moderate impact)



Survey Results

3. Please rate how inquiry-based learning impacted instruction within your classroom



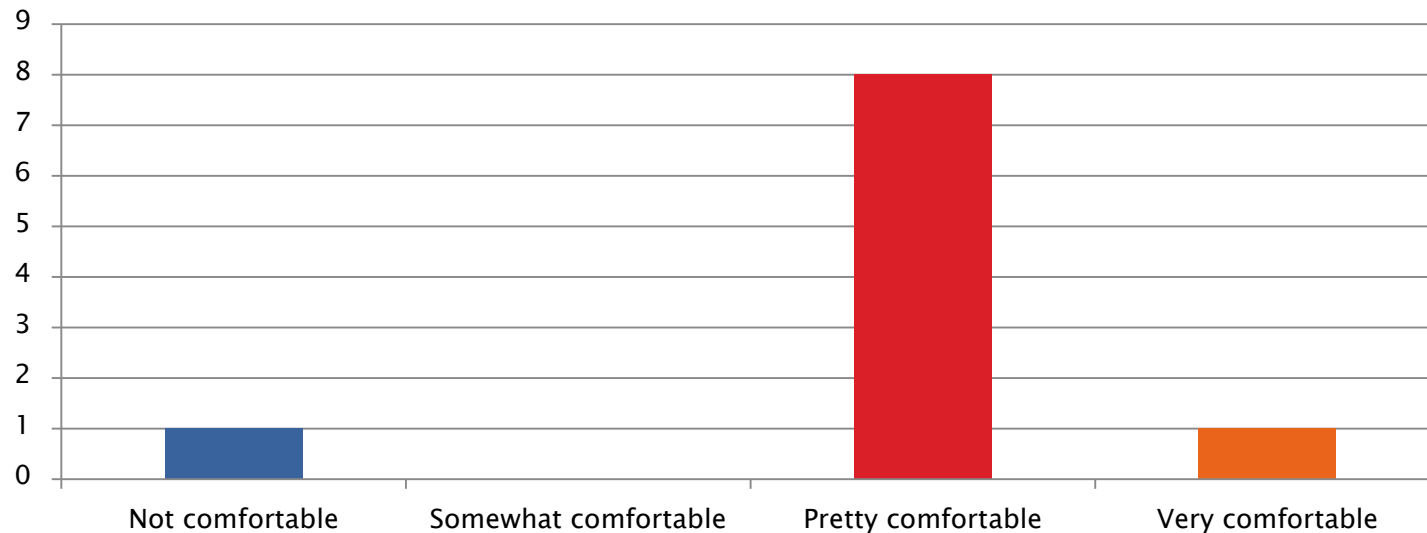
Survey Results: Graph 3 summary

- ▶ The biggest impact of Inquiry-based learning was on innovative lessons (80%)
- ▶ Knowledge and understanding of content areas (60%)
- ▶ Classroom management (50%) large impact (50%) moderate impact



Survey Results

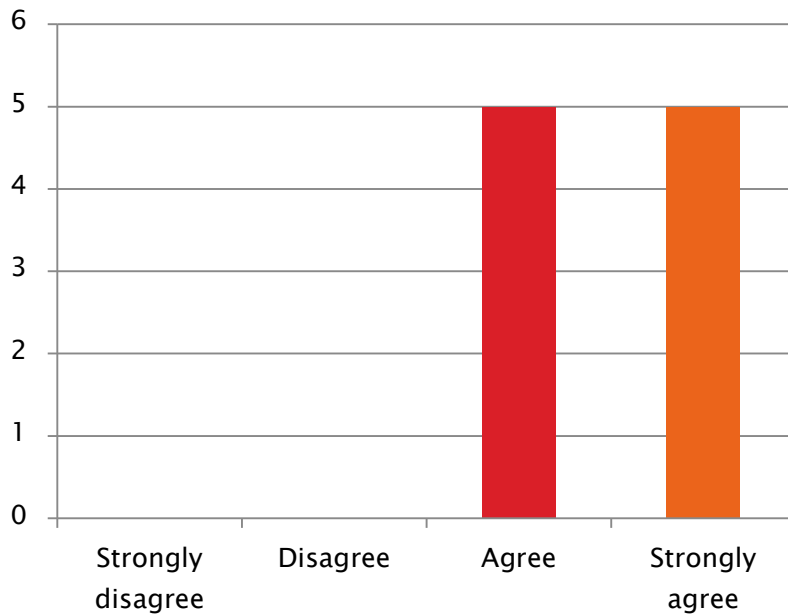
4. I am comfortable and confident in developing and implementing inquiry-based lessons in my classroom



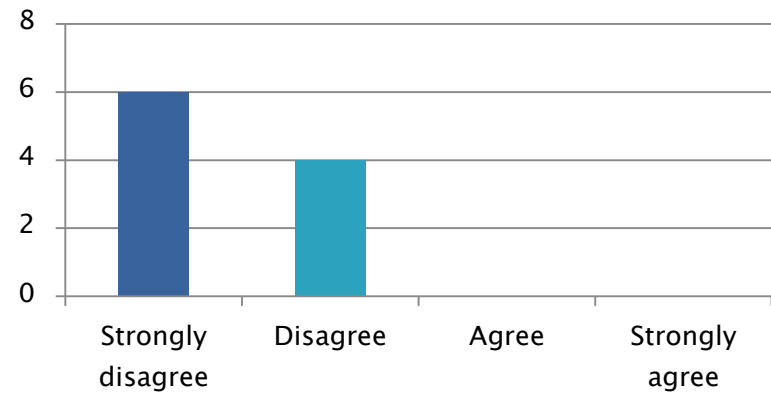
80% of teachers felt pretty comfortable and confident in developing and implementing inquiry-based lessons

Survey Results

5a. My role as a teacher is to facilitate students' own inquiry

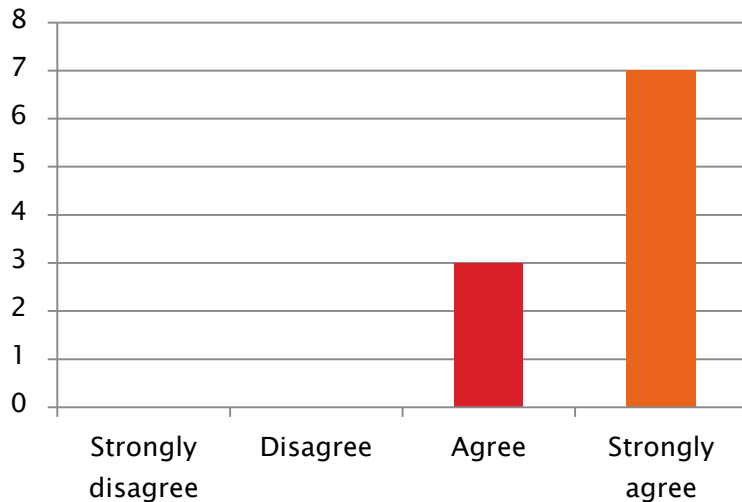


5b. Teachers know more than students; they shouldn't let students develop answers that may be incorrect when they can just explain the answers directly.

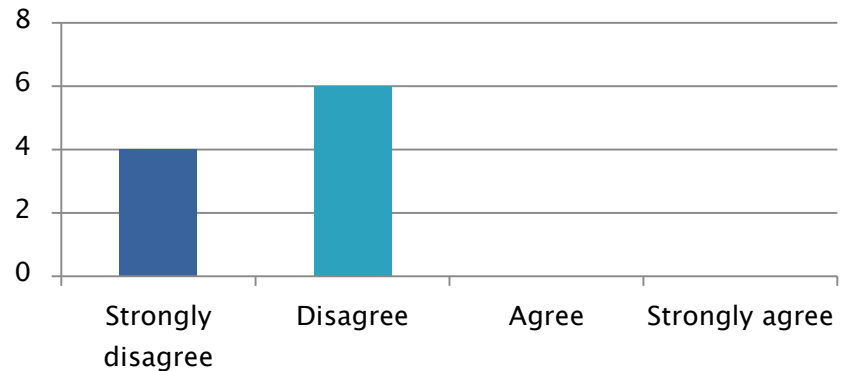


Survey Results

5c. Students learn best by finding solutions to problems on their own

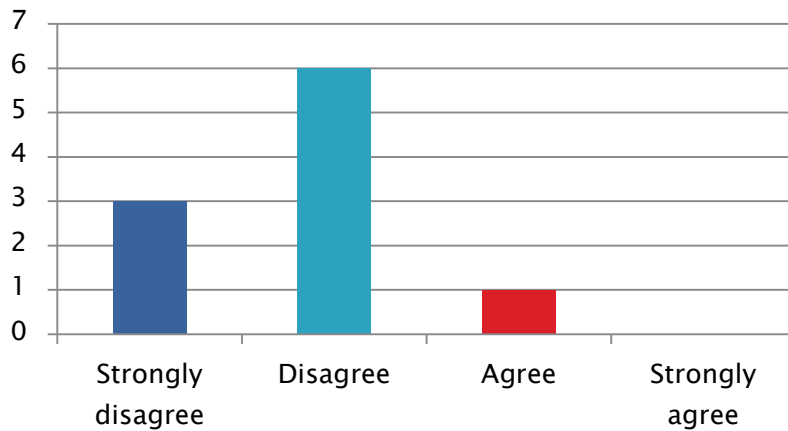


5d. Instruction should be built around problems with clear, correct answers, and around ideas that most students can grasp quickly.

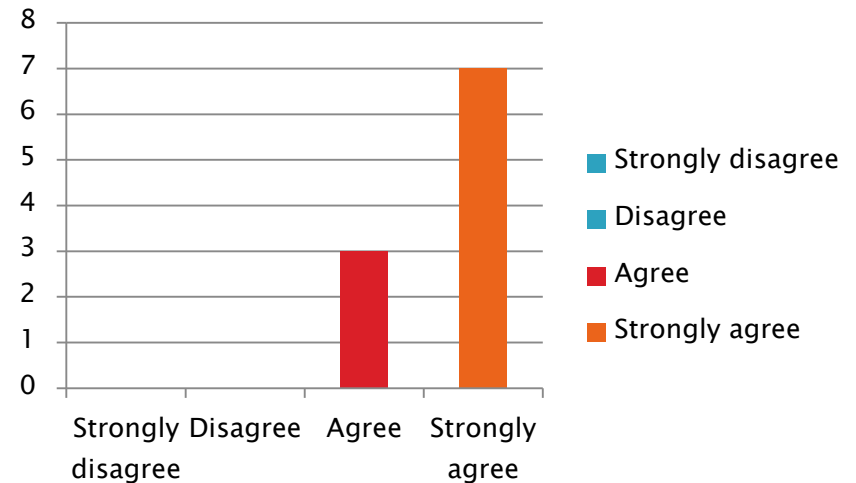


Survey Results

5e. How much students learn depends on how much background knowledge they have that is why teaching facts is so necessary

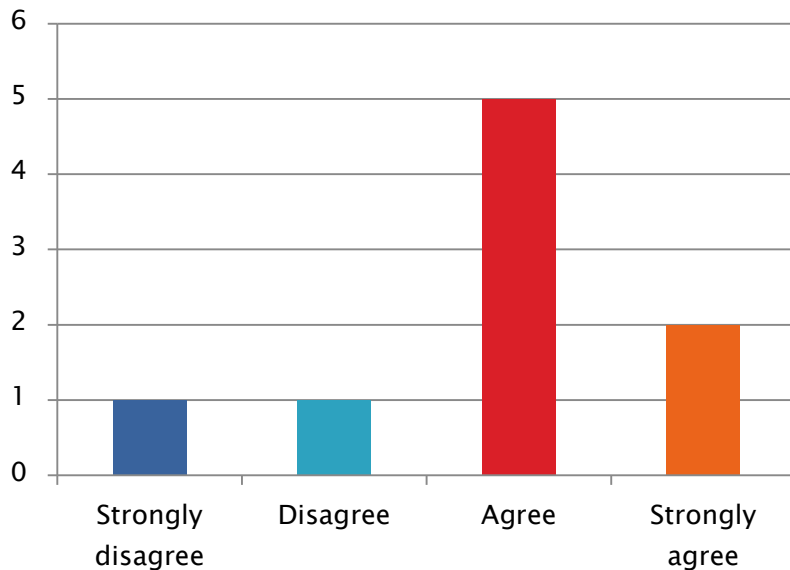


5f. Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved.

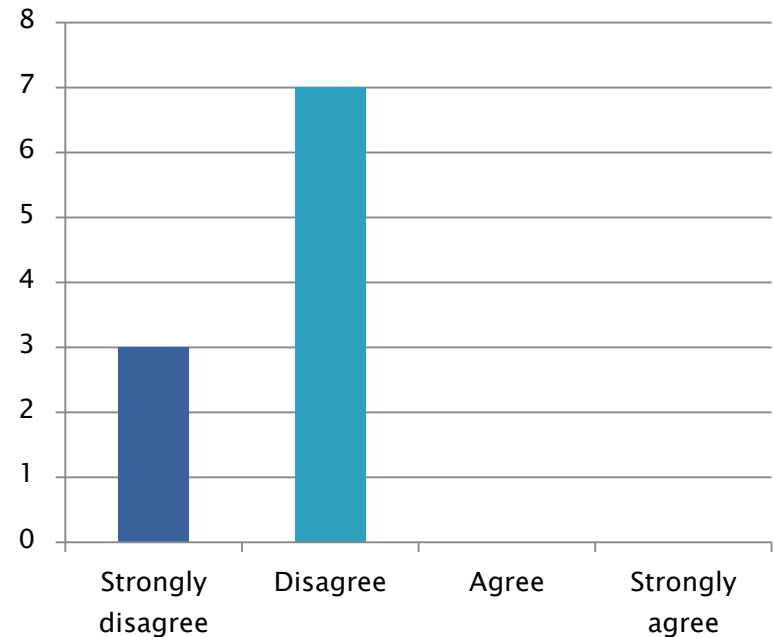


Survey Results

5g. "Good student performance" refers to performance that is greater than the previous achievement level of the student

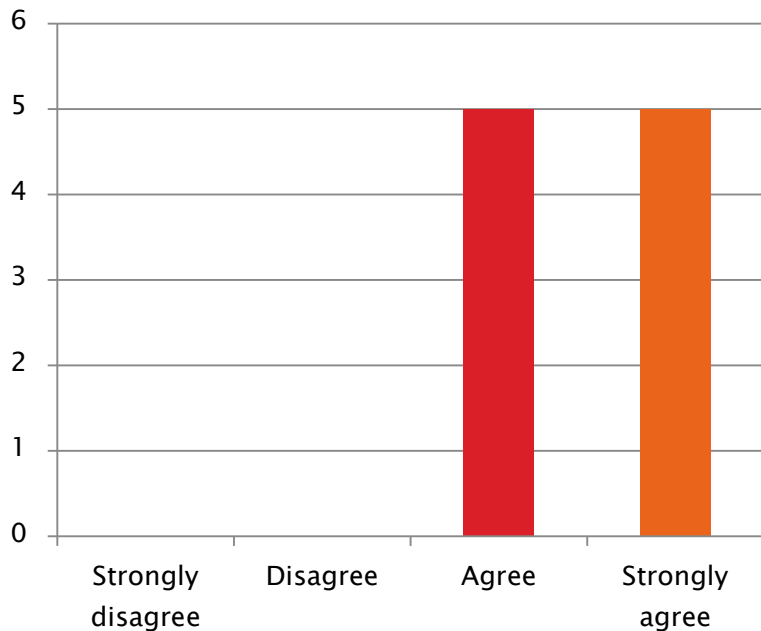


5h. A quiet classroom is generally needed for effective learning

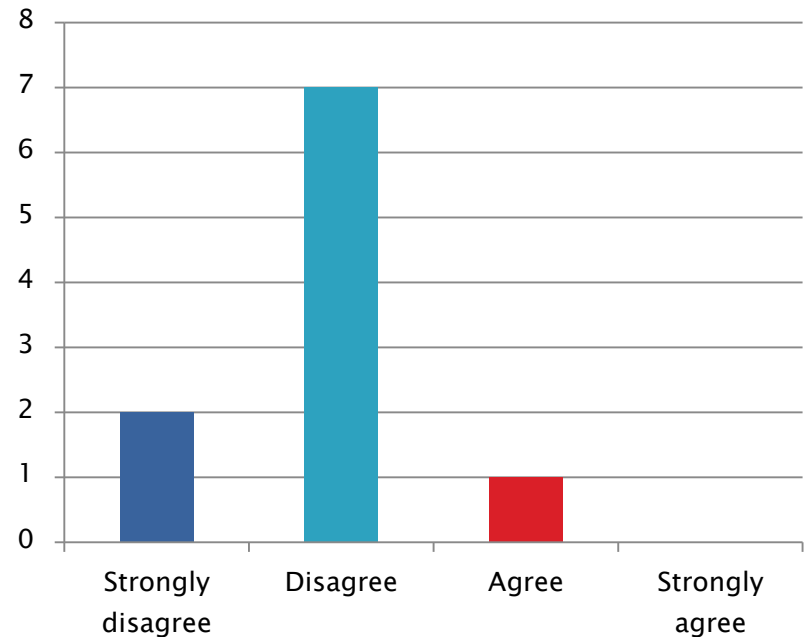


Survey Results

5i. Thinking and reasoning processes are more important than specific curriculum content

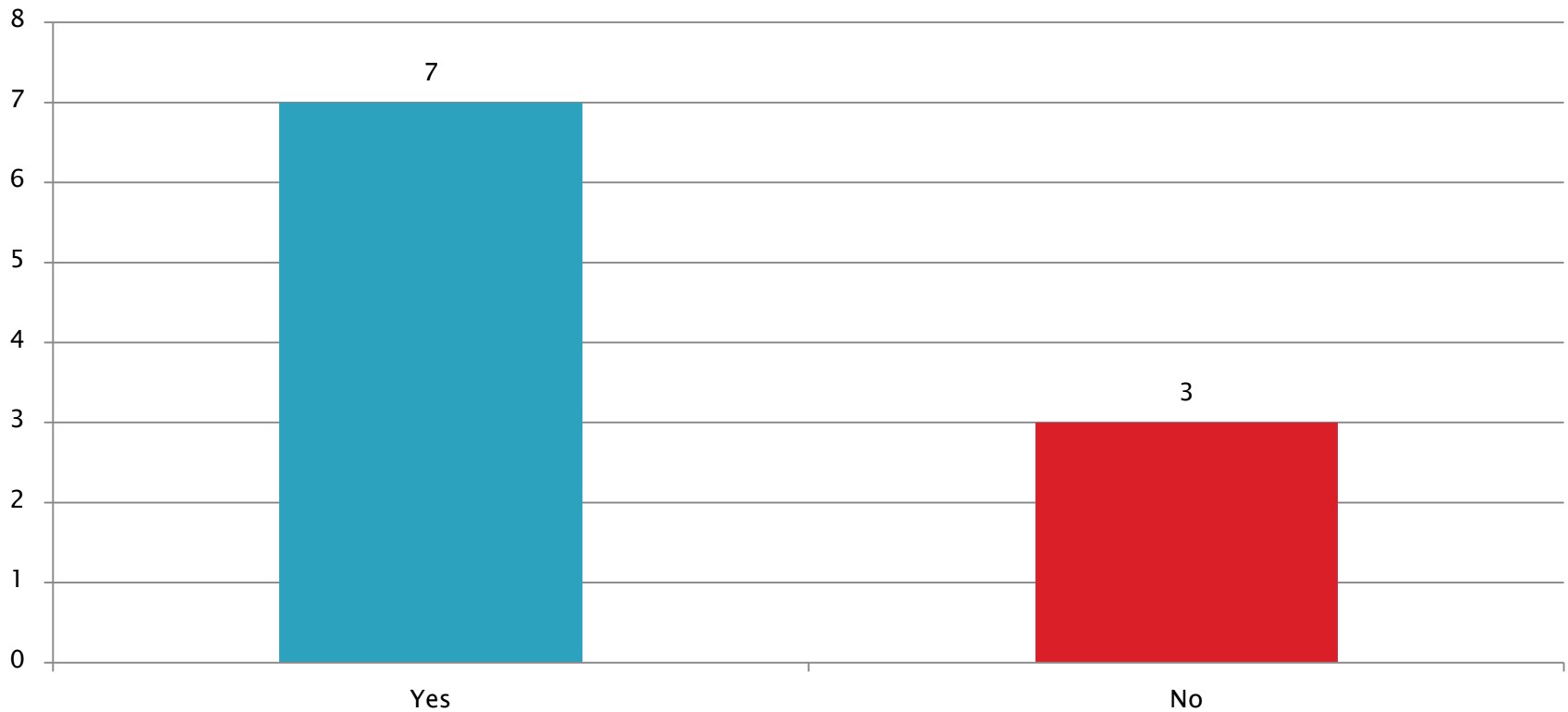


5j. Effective/good teachers demonstrate the correct way to solve a problem



Survey Results

6. Would you like to have a framework for developing inquiry-based lessons?



Indicated Needs

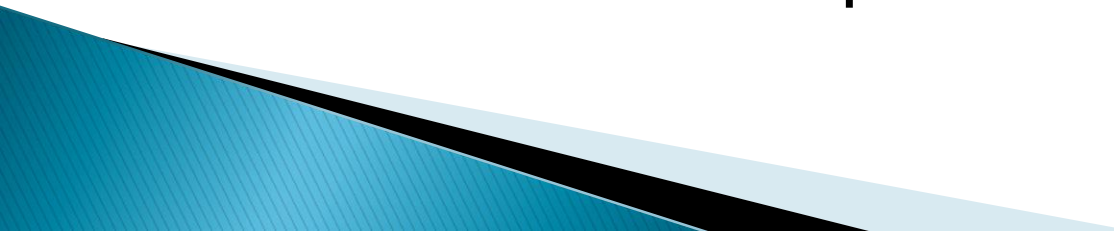
- ▶ Results of the survey indicated that teachers are not 100% comfortable implementing inquiry-based lessons in science and social studies.
- ▶ There is a lack of agreement in “observable qualities” in an inquiry-based lesson.
- ▶ 70% of the teachers would like a ‘checklist’ for developing inquiry-based lessons



The Challenge

- ▶ Our challenge is to create a list of “observable qualities” of an inquiry-based lesson.
 - Once the list is created, we will be asking for feedback from teachers, families, and students at the school in order to ‘tweak’ the final inquiry-based check list.

Next Steps

- ▶ Research of inquiry-based learning in order to identify observable qualities aligned with an authentic inquiry-based lesson.
 - ▶ Meet with Drs. Knapp and Mulvey (experts in the field) to validate the observable qualities I identified.
 - ▶ Drs. Knapp, Mulvey, and I each generated a list of observable qualities
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Next Steps

- ▶ The lists were compared and 17 observable qualities of inquiry-based instruction were identified.
- ▶ 17 observable qualities were established through triangulation.
 - Triangulation is a powerful technique that facilitates validation of data through cross verification from two or more sources.
- ▶ List was presented to teachers for feedback and to establish a 'Top Ten' list.

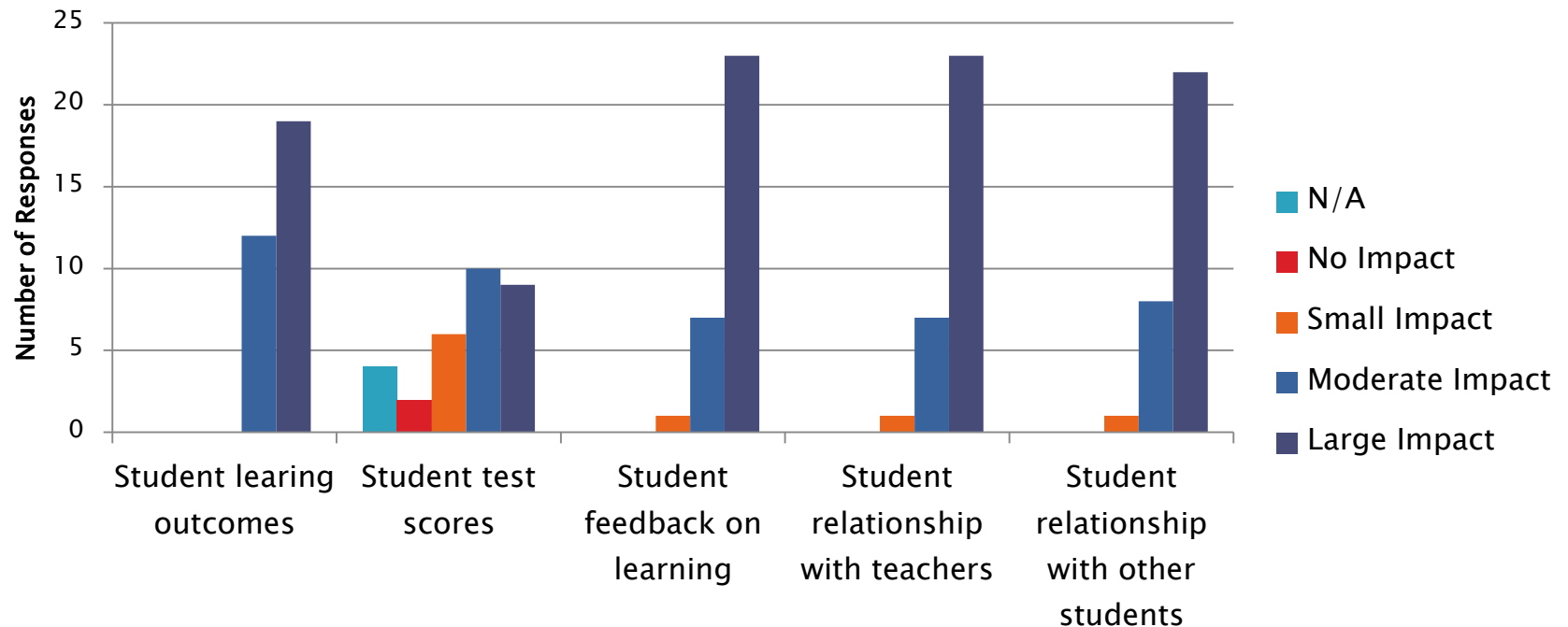
Family involvement

- ▶ A parent survey was developed in order to get parent feedback on the impact of inquiry-based instruction.
- ▶ Link to the [Parent Survey](#)



Parent Survey Results

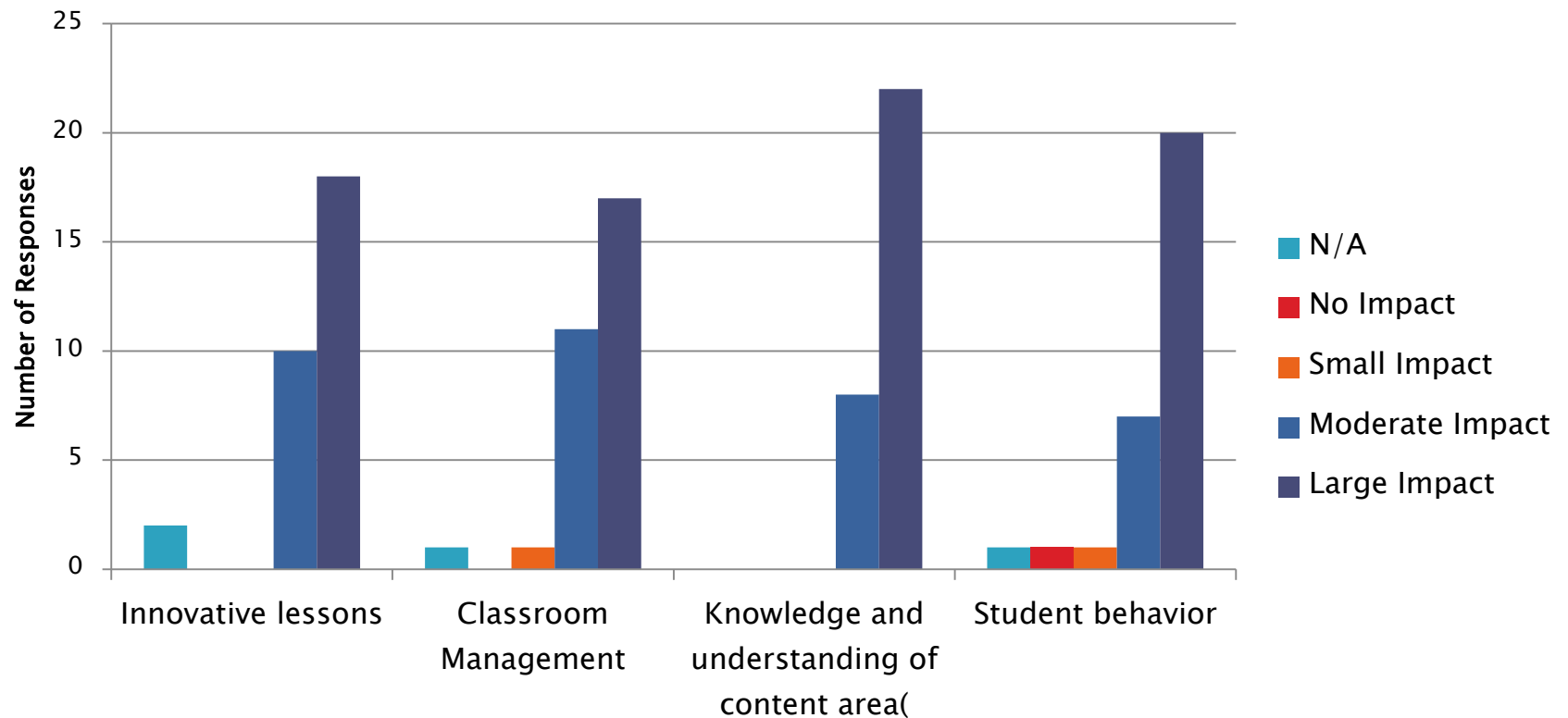
1. Please rate how inquiry-based instruction impacts the learning of your student



There is a distribution spread across the parent responses of how inquiry-based instruction impacts student test scores
(61% moderate - large impact and 39% small to no impact)

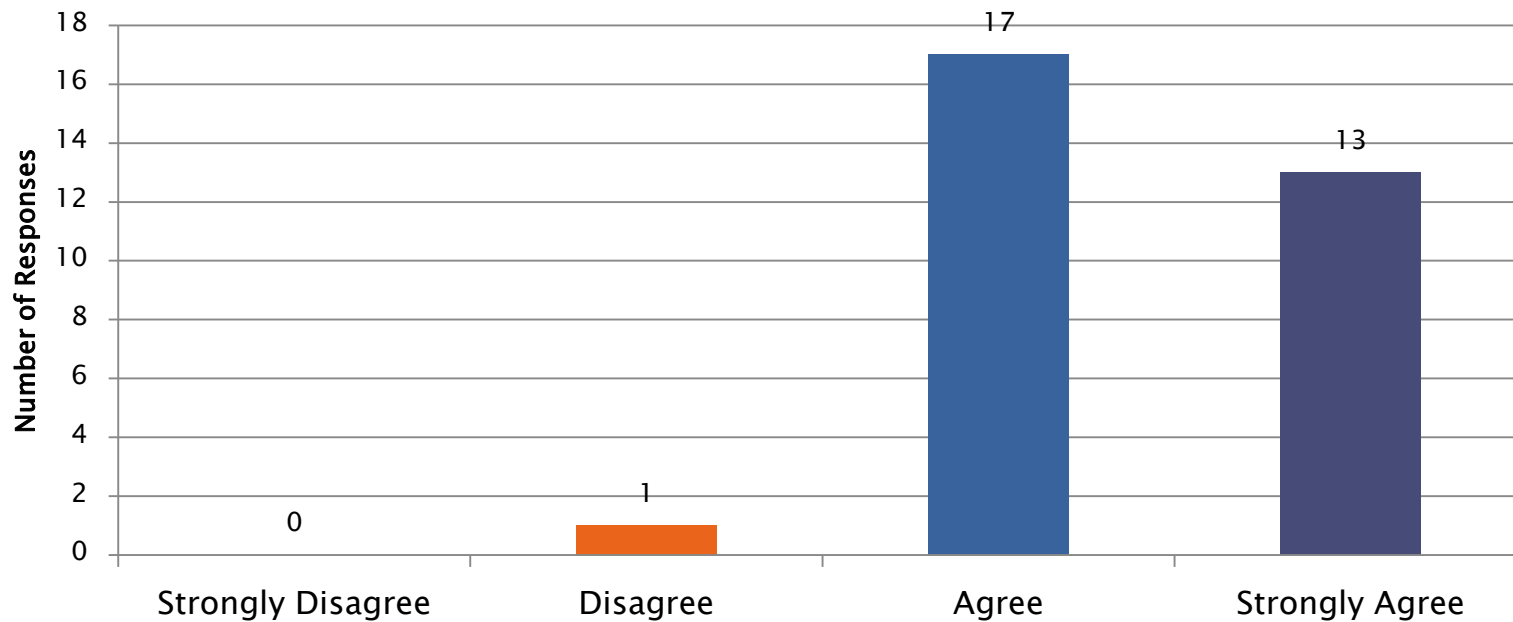
Parent Survey Results

2. Please rate how inquiry-based instruction impacts the instruction of your child



Parent Survey Results

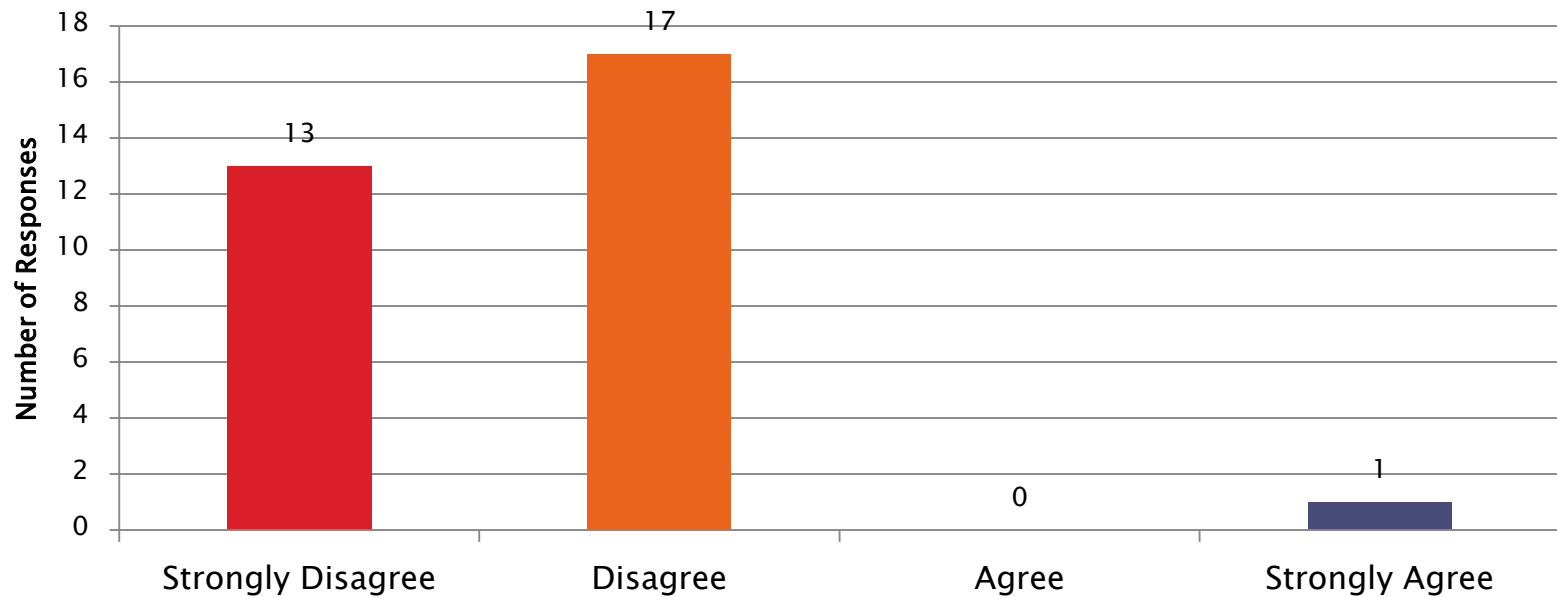
3a. A teacher's role is to facilitate students' own inquiry



97% of parents agree and strongly agree

Parent Survey Results

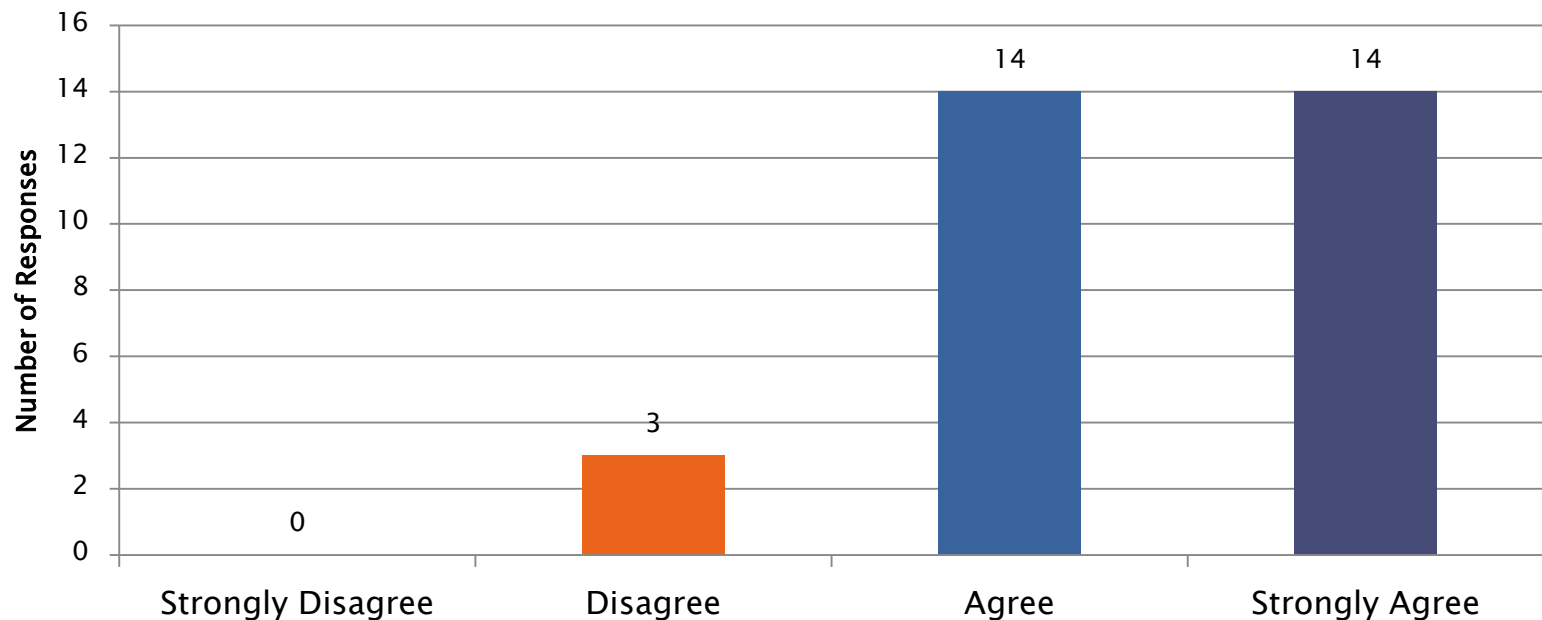
3b. Teachers know more than students; they shouldn't let students develop answers that may be incorrect when they can just explain the answers directly



97% of parents disagree and strongly disagree

Parent Survey Results

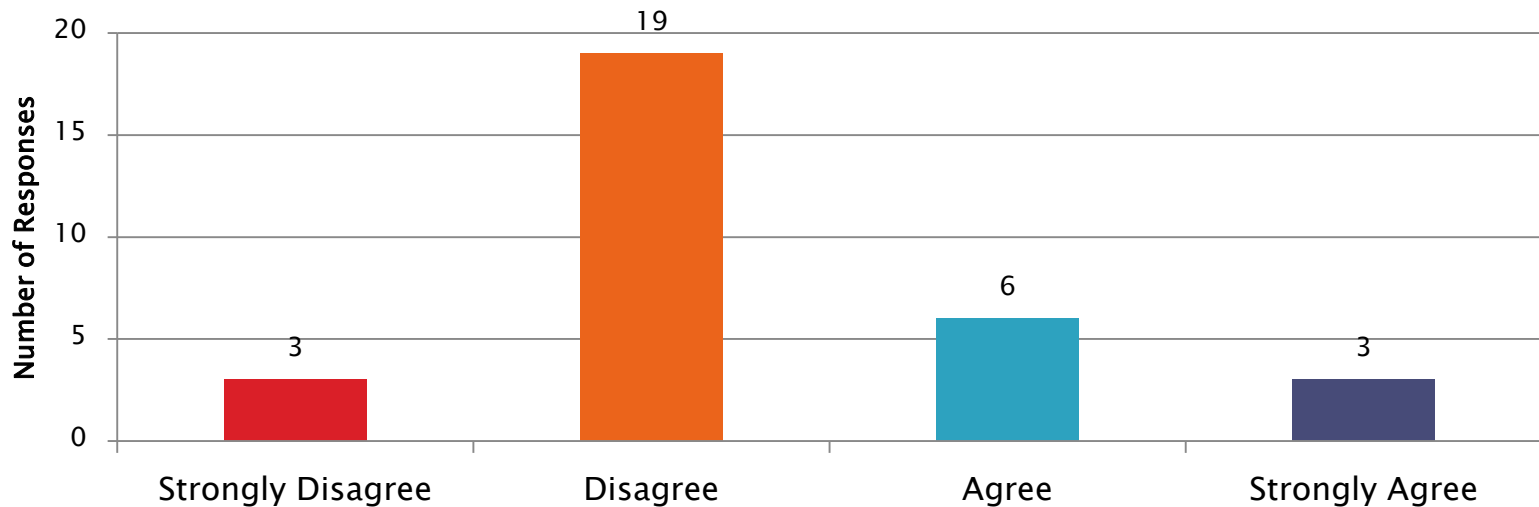
3c. Students learn best by finding solutions to problems on their own



90% of parents agree and strongly agree

Parent Survey Results

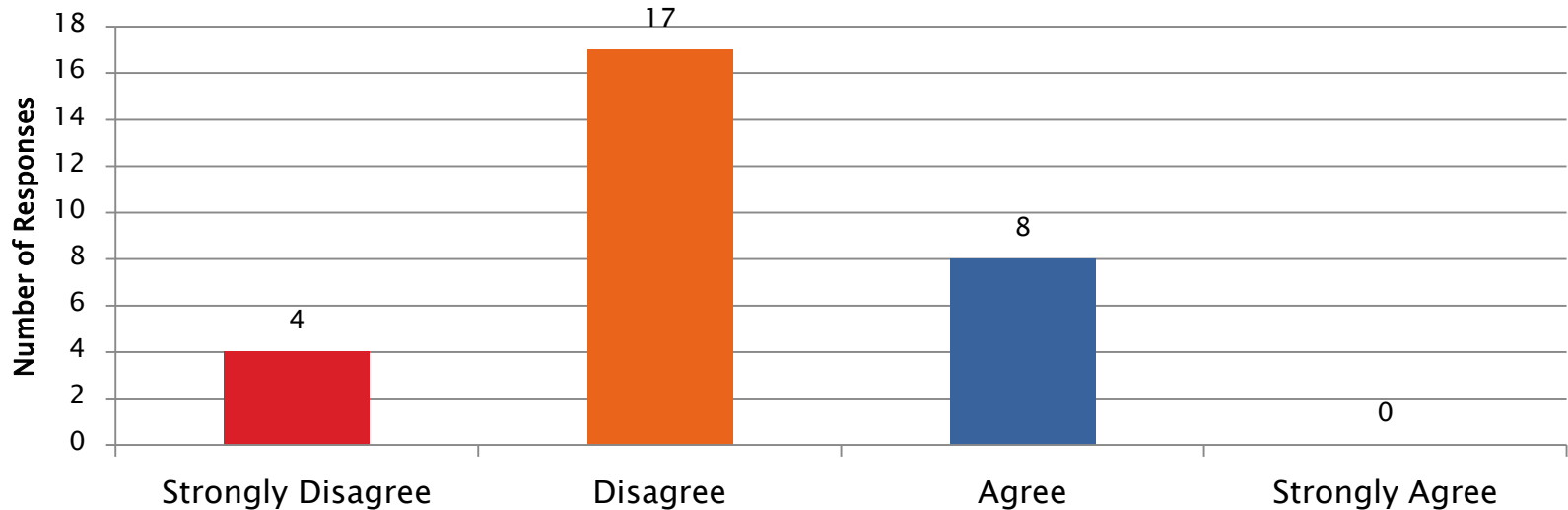
3d. Instruction should be built around problems with clear, correct answers, and around ideas that most students can grasp quickly



71% of parents disagree and strongly disagree
29% agree and strongly agree.

Parent Survey Results

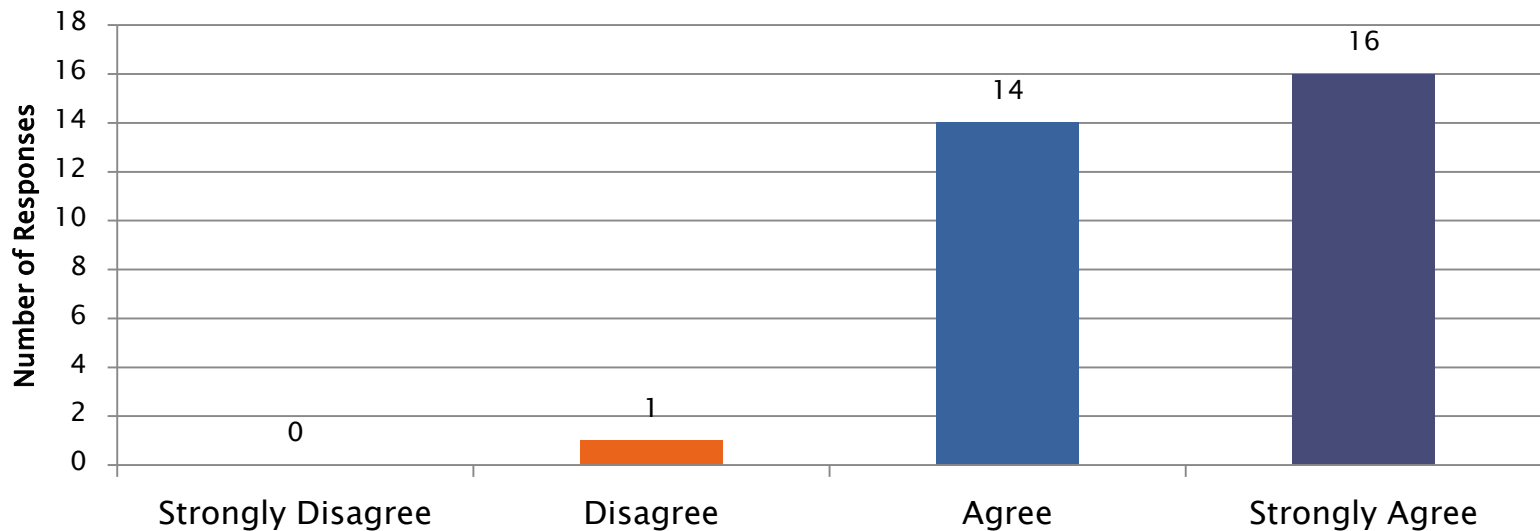
3e. How much students learn depends on how much background knowledge they have that is why teaching fact is so necessary



72% of parents disagree and strongly disagree
28% agree

Parent Survey Results

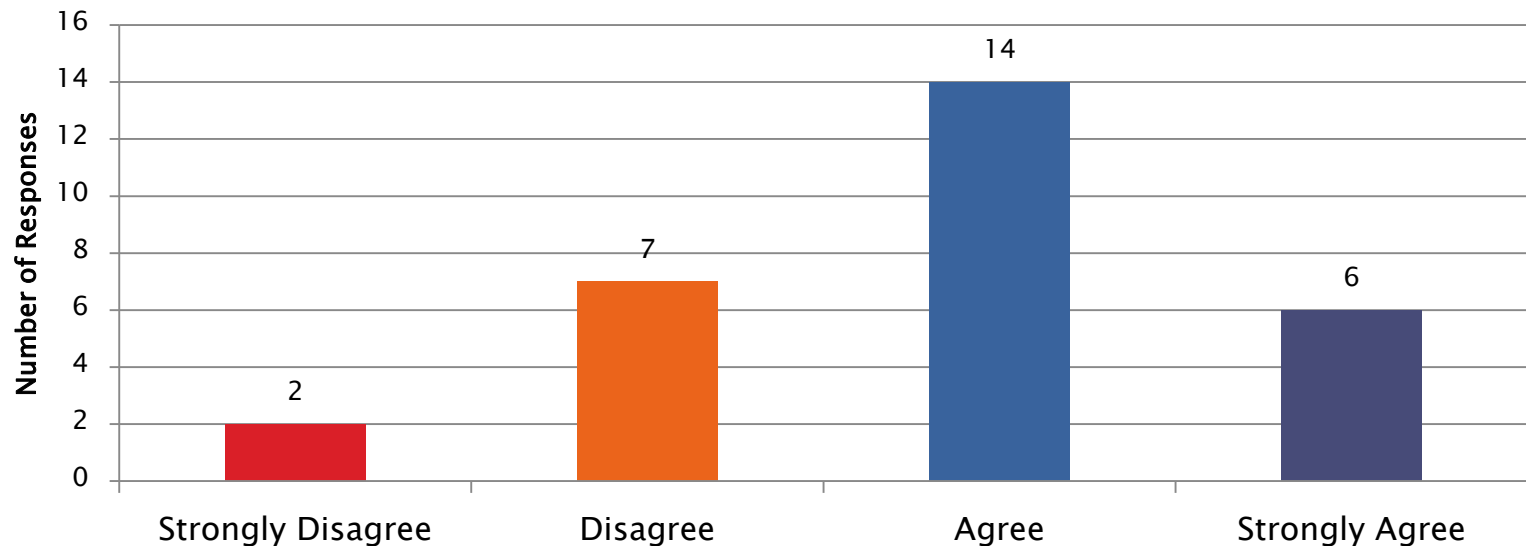
3f. Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved



97% of parents agree and strongly agree.

Parent Survey Results

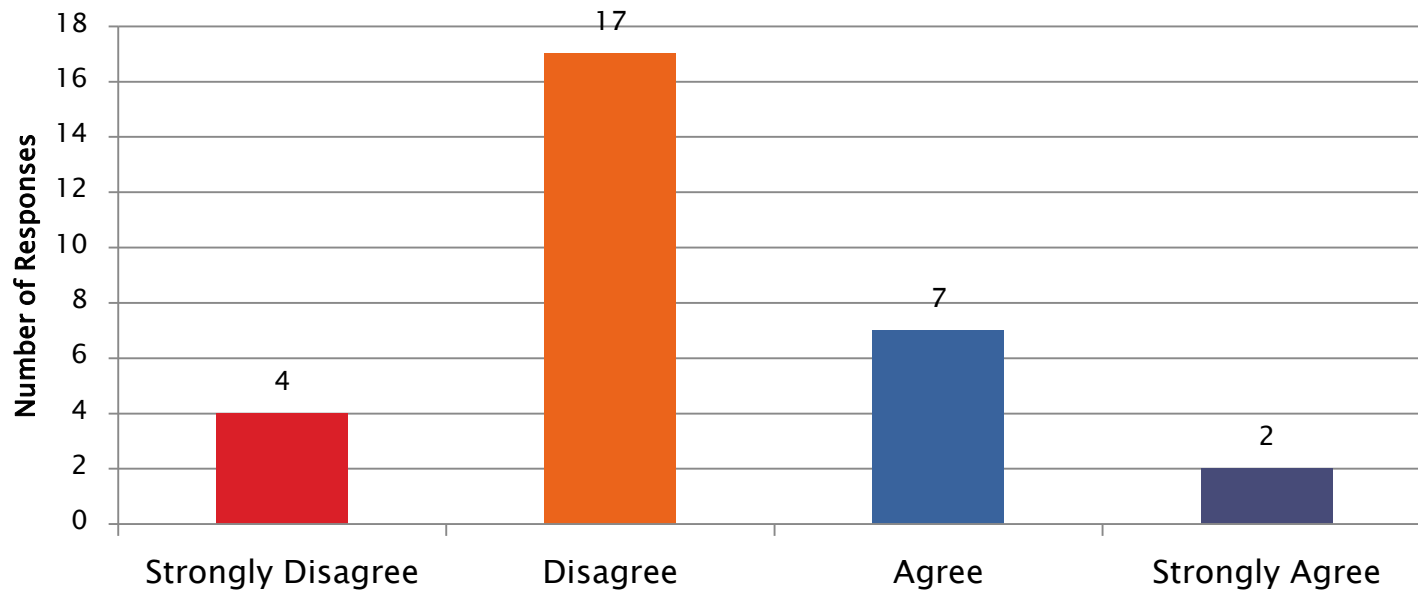
3g. "Good student performance" refers to performance that is greater than the previous achievement level of the student



31% of parents disagree and strongly disagree
69% of parents agree and strongly agree

Parent Survey Results

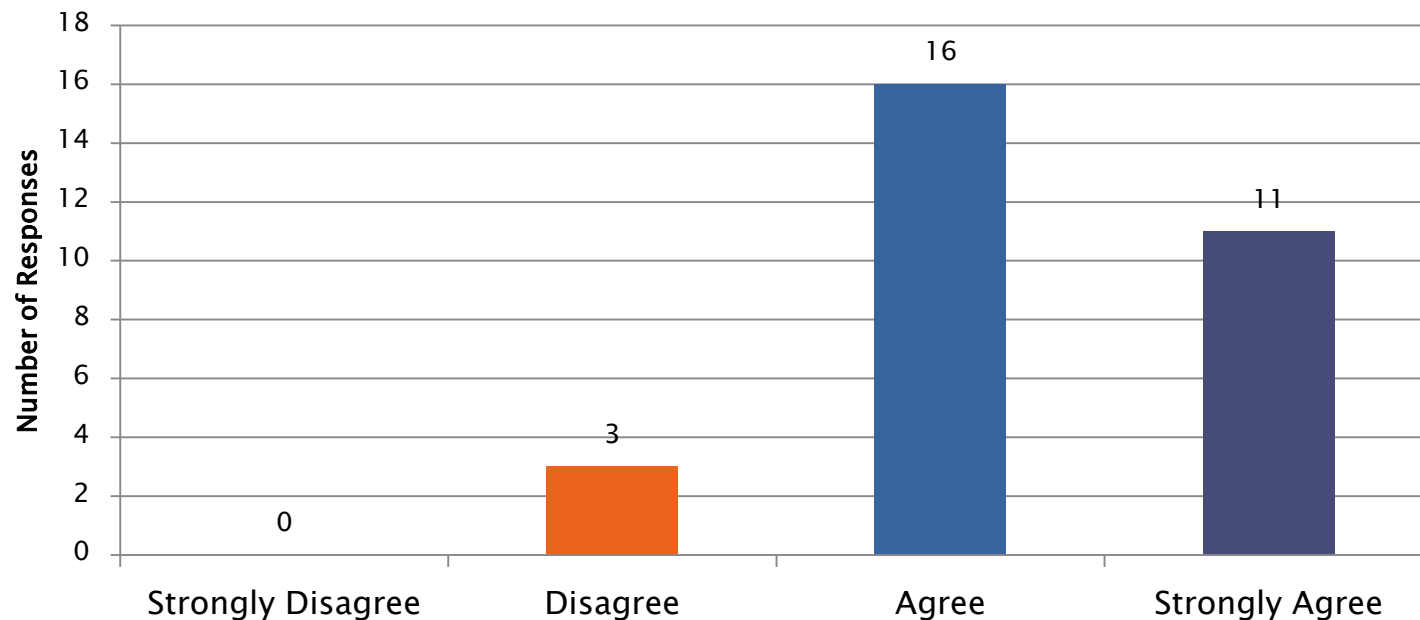
3h. A quiet classroom is generally needed for effective learning



70% of parents disagree and strongly disagree
30% of parents agree and strongly agree

Parent Survey Results

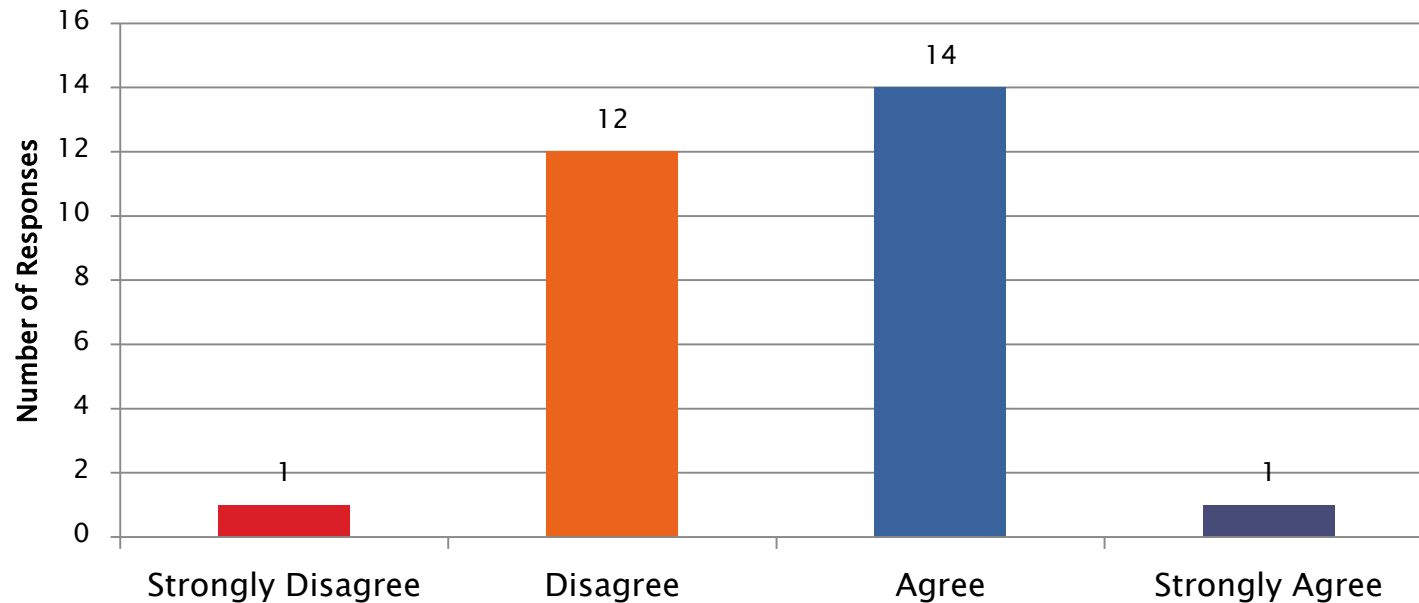
3i. Thinking and reasoning processes are more important than specific curriculum content



90% of parents agree and strongly agree

Parent Survey Results

3j. Effective/good teachers demonstrate the correct way to solve a problem



46% of parents disagree and strongly disagree
54% of parents agree and strongly agree

Parent Survey: Indicated Needs

(Q1) There is a distribution spread across the parent responses of how inquiry-based instruction impacts student test scores
(61% moderate – large impact and 39% small to no impact)

(Q.3d) 29% think that Instruction should be built around problems with clear, correct answers that students can grasp quickly
(29 % agree –strongly agree and 71% disagree –strongly disagree)

(Q.3e) How much students' learn depends on how much background knowledge they have that is why teaching facts is so necessary
(28% agree and 72% disagree or strongly disagree)

Parent Survey: Indicated Needs

(Q.3g) Good student performance refers to performance that is greater than the previous achievement level of the student.

(69% agree –strongly agree and 31% disagree –strongly disagree)

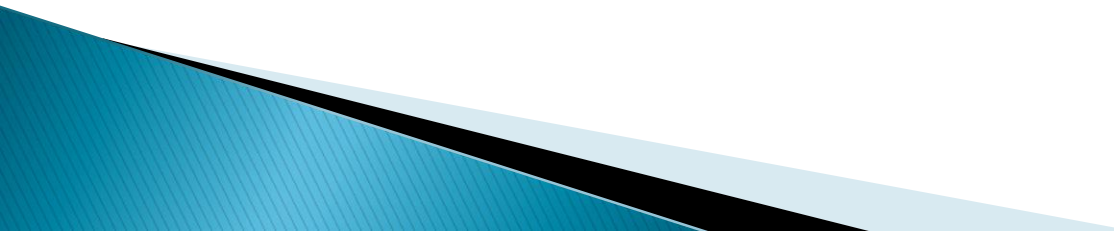
(Q.3h) A quiet classroom is generally needed for effective learning.

(30% agree –strongly agree and 70% disagree –strongly disagree)

(Q.3j) Effective/good teachers demonstrate the correct way to solve a problem.

(54% agree –strongly agree and 46% disagree –strongly disagree)

Parent Comments:

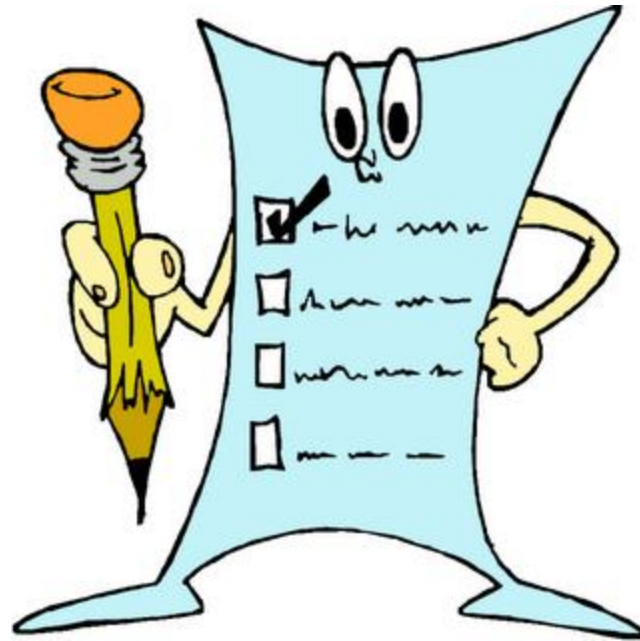
- ▶ As a parent, I had a difficult time answering the survey because I was unsure of the specific goals of inquiry-based learning
 - ▶ I am unsure how to explain or describe how inquiry-based instruction is delivered and measured for both teachers and students
 - ▶ I would like to see the specific student and teacher goals and objectives
 - ▶ If I knew the goals and objectives, I would be able to identify and measure my child's interest, progress, outcomes, and learning through inquiry-based instruction.
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Student Feedback

- ▶ 20 randomly selected students from grades 1 – 5 participated in a semi-structured interview to offer their thoughts on inquiry-based lessons.
- A semi-structured interview was appropriate to use because I only had one opportunity to interview the children (Bernard, 1988).
- Characteristics of a semi-structured interview:
 - Interviewer & respondents engage in a formal interview.
 - Interviewer develops and uses a list of questions to be covered during the conversation.
 - Interviewer follows the list of questions, but is able to follow topical trajectories in the conversation that are appropriate.

Student Feedback

▶ Student Interview Questions



Student Responses: 1st grade

What makes learning fun?

- ▶ Math
- ▶ You get to learn new things like $E = MC^2$
- ▶ Making stuff about apples
- ▶ Learning about animals

How do you think you learn best?

- ▶ When we do things
- ▶ When she [the teacher] talks for a short time and then we do it
- ▶ I like doing things alone. I like to figure things out
- ▶ I like to see or read examples
- ▶ Reading

What does your teacher do to help you learn?

- ▶ Discover things by ourselves
- ▶ Talking about stuff
- ▶ Our teacher shows us what we're going to do as she's talking
- ▶ Watch videos

What is your most favorite thing you've done in science or social studies

- ▶ We got to read books about science
- ▶ Learning about famous people who helped slaves
- ▶ Learning about experiments

Student Responses: 2nd Grade

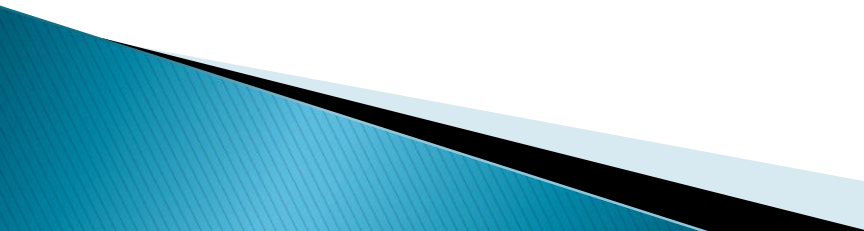
What makes learning fun?

- ▶ Making projects
- ▶ Computers

How do you think you learn best?

- ▶ When I have a sheet to fill out
- ▶ When we have something to do so we can learn from it
- ▶ Reading
- ▶ Thinking about stuff
- ▶ Using digi blocks to figure out math problems
- ▶ When teachers talk it through

What does your teacher do to help you learn?

- ▶ Uses numbers and pictures to figure out math
 - ▶ She uses numbers, words, and labels
 - ▶ We make predictions
 - ▶ Predictions aren't always right, but it's OK so you can learn off your mistake
 - ▶ Experiments
 - ▶ She tells us what to do
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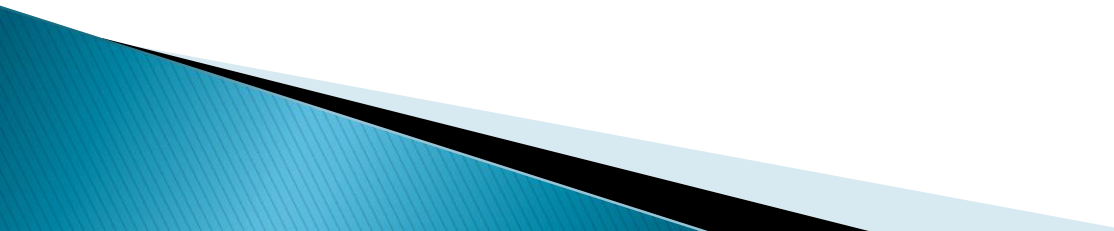
Student Responses: 4th grade

What makes learning fun?

- ▶ When you figure out something by yourself and [you are] proud of yourself of what you learned
- ▶ Learning new stuff
- ▶ When you figure something out and do inquiry like researching questions
- ▶ Instead of using a textbook and stuff, do different ideas like playing games and stuff and things that are normally fun for kids
- ▶ More activities
- ▶ **How do you think you learn best?**
- ▶ I learn best when I can physically do something or remember a catchy metaphor for it
- ▶ I learn best if I can see and hear things
- ▶ It depends on what we're doing like sometimes I just want to hear about it and sometimes I just want to see it
- ▶ For me its hard because I don't understand stuff really well and so I'll say can you 'break stuff down for me for a little bit' and show me. I don't want to take too much time away from the class asking all of my questions. For me, it takes a lot of questions and it takes like the whole class period so I don't ask too many questions because there are other people and I don't want to take up all of the time.

Student Responses: 4th grade

What does your teacher do to help you learn?

- ▶ She doesn't tell us the answer, we just have to research and come up with the answer ourselves.
 - ▶ Sometimes we have these really hard problems and she just says solve it and some people cry though.
 - ▶ She does games and stuff to refresh our memories, she doesn't always like paper tests, and she doesn't like busy work she likes the whole class to be on the same level... I guess not all on the same level but just like everyone understanding and if they do understand it, we will move on and she will challenge us and she doesn't give much homework.
 - ▶ My teacher helps us learn by giving us multiple strategies or multiple ways to solve it and if we don't understand, she helps us with the problems so we can understand and she also prepares us for future things like she says in 5th grade you can't be so noisy and stuff and you have to get your work done.
 - ▶ Sometimes the teacher asks how do you think it will work out or how do you think the results will be and we give our answers and some are the same as the actual result and some are totally different but usually our answers are pretty cool and different from each others.
- 

Student Responses: 4th grade

What is the most favorite thing you've done this year in science or social studies?

- ▶ learning about electricity, we're all making an electricity house. In social studies we learned about government and we each got to make our own textbook page about one of the questions that the text book didn't address. We got to choose our questions and then we typed them and printed them out. We made it into a book and if we got stuck finding the answers to our questions she [the teacher] would help us find books or websites to help us find the answers.
- ▶ In science we do experiments. One of them was about pennies and vinegar and we put the penny in vinegar to see how shiny it gets. Another one, we mixed baking soda and vinegar and then we mixed mustard and vinegar, that turned out disgusting! We do a lot of science experiments and we do them in groups. Also in social studies, we're doing this homeless thing and we all made up questions. It all started when my friend asked a question about homelessness. My question is how do professional athletes end up homeless and I have to find out.
- ▶ For me, I don't like to do a lot of studying or a lot of work but some of the stuff we do is kind of fun but I don't like doing work or studying sometimes because it makes my head hurt from thinking really hard. In social studies we get to watch Liberty's Kids which explains all the wars and how it happened and there's a lot of episodes so it's a good way for us to wind down and not talk.
- ▶ I like to do the science experiments because they are creative. We did the pennies and the vinegar and we also did one with M&M's and it was really cool to see how the color came off and to eat them.
- ▶ My favorite part of social studies and science, we did literacy circles which was inquiry-based so that was probably my favorite thing to do in social studies and science. My social studies question was if the French Indian war started in 1754 why didn't it spread to Europe until 1756? But the war didn't really start in 1754, it was just small battles. In science literacy circle our question was, Is rust a chemical reaction? It is because iron and water make rust. And we did something about patina too when you put a penny in vinegar for a long time, the green stuff, the patina, comes off.

Student Responses: 5th grade

What makes learning fun?

- ▶ Doing activities
- ▶ Website [Kahoot]it's makes it fun to learn
- ▶ When everyone is happy and nobody's mad or grumpy

How do you think you learn best?

- ▶ When I can hear and see something
- ▶ I like doing things and looking at stuff
- ▶ I learn best by looking, hearing, and doing

What does your teacher do to help you learn?

- ▶ We play games that help us learn
- ▶ She [the teacher] makes sure we know the whole thing
- ▶ She gives us a practice test to see if we understand it or not and depending on that, she might teach us again - more broken down so we understand

Student Responses: 5th grade

What is your most favorite thing you've done in science or social studies

- ▶ We investigate stuff, like observing animals and we created an ecosystem for them
- ▶ We watch stations to learn how something works
- ▶ Doing experiments in science. It's more active and you do more activities like that thing with milk and the food coloring
- ▶ The puking pumpkin – it was a chemical reaction

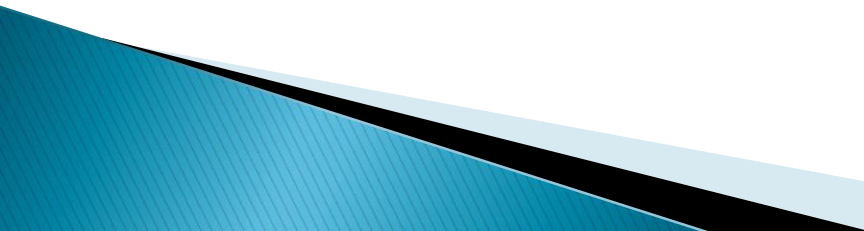
Is there anything you wish your teacher would do to help you learn better in the classroom?

- ▶ I want my teacher to do more activities – like with chemicals, and with science
- ▶ We don't do anything much with chemicals in science
- ▶ Mostly we just do stuff like writing, like writing research

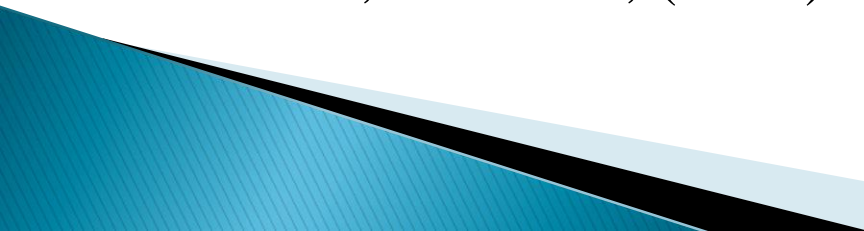
What kind of projects do you do in your class?

- ▶ We do book reports
- ▶ We have never done a project in social studies
- ▶ We do a lot of informational reports
- ▶ We do essays a lot – yes, we do a lot of essays
- ▶ We did a report on Inca's, Maya's, Aztec's, and Mississippian's on why we wanted to live there or not

Research-based Solution 1: A Need for a Checklist

- ▶ Teachers need to be assured that inquiry-based instruction is understood, objectively evaluated, and rewarded when executed well. The evaluator must also understand inquiry to know what to observe in the classroom (The National Research Council, 2000).
 - ▶ Evaluators need to observe how teachers use materials, interact with students to increase understanding, and assess student work and thinking as an indicator of whether students are actively engaged in inquiry (Gerber, Cavallo, & Marek, (2001).
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Research-based Solution 2: Educating Parents About Inquiry-based Instruction

- ▶ The National Research Council (2000) discusses the significance of convincing parents of the importance of children's "why" questions and how inquiry-based instruction engages students in a multifaceted activity that involves critical and logical thinking.
 - ▶ Administrators need to introduce and explain inquiry to parents whose students are involved as it is better to be proactive than reactive. They need to share the advantages of teaching and learning this way and be open about the adjustments that some students will have to make to succeed. Furthermore administrators should encourage teachers to clearly communicate what they expect students to know and be able to do and how they will be assessed and graded (Gerber, Cavallo, & Marek, (2001).
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PD Action Plan

- ▶ May 2017
 - Review 5 year plan
 - Review all survey data
 - Teacher groups develop examples of observable qualities of inquiry-based instruction.
- ▶ June 2017
 - Using an inquiry approach, teachers determine what PD is needed for next year
 - Finish developing and finalizing examples of observable qualities of inquiry-based instruction
- ▶ August 2017
 - Implement 1st PD session as planned from June PD
 - Review 'Top Ten List' of observable qualities of inquiry-based instruction
 - Assign teachers to create videos to model what the observable qualities should 'look like' for the purpose of training future teachers
 - Assign experienced teachers as coaches as needed

Standards Addressed:

- ▶ **Developing a Vision**
- ▶ a. Candidate participates in developing a vision of learning for a school that promotes the success of all students.
- ▶ b. Vision is based on relevant knowledge and theories, and learners' needs.
- ▶ c. Candidate communicates the vision to staff, parents, students, and community.
- ▶ **1.3 Implement a Vision**
- ▶ b. Candidate develops plans and processes for implementing the vision.
- ▶ **1.4 Steward a Vision**
- ▶ a. Candidate understands the role effective communication skills play in building a shared commitment to the vision.
- ▶ c. Candidate assumes stewardship of the vision through various methods.
- ▶ **1.5 Promote Community Involvement**
- ▶ a. Candidate involves community members in the realization of the vision and in related school improvement efforts.
- ▶ **2.3 Apply Best Practice to Student Learning**
- ▶ a. Candidate assists school personnel in understanding and applying best practices for student learning.
- ▶ b. Candidate applies human development theory, proven learning and motivational theories, and concern for diversity to the learning process.
- ▶ c. Candidate uses appropriate research strategies to promote an environment for improved student achievement.

Standards Addressed

- ▶ **2.4 Design Comprehensive Professional Growth Plans**
- ▶ a. Candidate implements well-planned, context-appropriate professional development programs based on reflective practice and research on student learning consistent with the school vision and goals.
- ▶ **3.2 Manage Operations**
- ▶ a. Candidate involves staff in conducting operations and setting priorities.
- ▶ **4.1 Collaborate with Families and Other Community Members**
- ▶ a. Candidate involves families in the education of their children.
- ▶ e. Candidate involves families and other stakeholders in school decision-making.
- ▶ **5.1 Acts with Integrity**
- ▶ Candidate respects the rights of others with regard to confidentiality and dignity and engages in honest interactions.
- ▶ **6.1 Understand the Larger Context**
- ▶ a. Candidate acts as an informed consumer of educational theory and applies appropriate research methods to a school context.
- ▶ **6.3 Influence the Larger Context**
- ▶ c. Candidate advocates for policies and programs that promote equitable learning opportunities and success for all students.

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