

The Fresno Metropolitan Museum

Inquiry Workshop

Evaluation

And whether or not we have a lot of time, at any particular subject area, by attending this workshop you learn to be a better teacher across the board with questioning [techniques] that can be incorporated [into] any subject matter. So thank goodness we do have this because now we'll be able to get more bang for the few minutes that we'll be able to teach it!

-teacher participant

Prepared for the Fresno Metropolitan Museum by

Visitor Studies Services

June 2005





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Introduction

The Fresno Metropolitan Museum (FMM) contracted with Wendy Meluch of Visitor Studies Services to design and conduct an evaluation of its Inquiry Workshop (workshop) which took place in April of 2005. All workshop participants completed Pre- and Post-workshop Surveys (13 and 12 respectively). Nine teachers also participated in a follow-up focus group in June of 2005.

The reader is encouraged to read participant teachers' own words. All verbatim responses to the Pre- and Post-workshop Surveys are listed in the Survey Results sections following the Summary of Findings below. Focus group discussions are paraphrased in the Focus Group Discussion Notes below.

Executive Summary

By all measures, the Fresno Metropolitan Museum's Inquiry Workshop is resounding success for participating teachers. They become energized about teaching and credit the workshop with making them better teachers across the board. They are enthusiastic about their experiences using the inquiry method in the classroom and the impact it has on students. Students become excited and engaged, meaningfulness of curriculum and student depth of knowledge are increased as they participate in observing and questioning rather than simply listening to the teacher.

FMM has certainly begun to establish itself as a valuable resource to the education community of greater Fresno. These participants are eager to share their ongoing experiences of using the inquiry method; and they are already engaging in a lively exchange of ideas and resources. They offer many useful ideas and encouragement for future workshops and how to market them.

Summary of Evaluation Findings

Teacher participants in the FMM Inquiry Workshop are energized about their own teaching and about their students' improved learning experiences that directly result from attending the workshop. In their own words...

- Now after the workshop, I can encourage the kids to observe and ask questions... It takes some of pressure off me and the kids get a lot more depth of knowledge.
- Science is my hardest area... the class really helped me to probe and question the kids more... Asking the questions [made] a more exciting atmosphere for the kids, and it was much more meaningful for them. It was just this little thing, but I thought, ok I got my feet wet, and I was very pleased and happy with the results.
- You talk about kids being engaged! Being active participants with the content, that's what's so wonderful about science, it is engaging! Whether you're an English language learner, or a special ed. student or a GATE student, it hooks every one of them.



- And whether or not we have a lot of time, at any particular subject area, by attending this [workshop] you learn to be a better teacher across the board with questioning that can be incorporated for any subject matter. So thank goodness we do have this because now we'll be able to get more bang for the [few] minutes that we'll be able to teach it.
- Coming to things like this and just having the conversation helps so much...

FMM's Inquiry Workshop participants are enthusiastic about the quality of workshop contents and instruction, and the ability of the instructors. All participants rate the workshop as *valuable* to *very valuable*. Every one of them left the workshop with tools and/or ideas that they can use in the classroom right away.

Indeed, most teachers in the focus group had already experimented with the inquiry method. Each of them had an excellent experience with it and found it widely applicable in other subject areas. They were thrilled by student response to the method; students were engaged and excited to participate. Teachers feel that the inquiry method makes it easier for them to be effective while it enhances the student experience, depth of knowledge and meaningfulness of content. Teachers agree that science and art, especially when using the inquiry method, are extremely important for English language learners to build confidence and support learning.

Though most teachers report that the workshop addressed their concerns about using the inquiry method, time constraints remained as the primary difficulty that teachers expect to struggle with in terms of using this method and/or simply teaching science. During the focus group, public school teachers underscored their frustration with time limitations but felt very strongly that the workshop had made them better teachers and given them effective tools such that they can make the most of the time that they do have for instruction. Some teachers are already developing creative ways to use the inquiry method even with shrinking instructional time for science.

The workshop effectively gives participant teachers a more clear understanding of the inquiry method and helps them understand how to employ it in their classrooms. After participating in the workshop teachers are more accurate and specific when defining: 1) the inquiry method, and 2) the relationship between art and science. Teachers at the focus group session were clearly confident in the method and expressed new comfort with teaching science as a result of attending the workshop.

FMM has certainly begun to establish itself as a valuable resource to the education community of greater Fresno. These participants are eager to share their ongoing experiences of using the inquiry method; and they are already engaging in lively exchange of ideas and resources. They offer many useful ideas for future workshops and how to market them.



Summary of Survey Findings

Workshop Impacts

As a result of the FMM Inquiry workshop, teachers felt significantly more clear in their understanding of inquiry, and felt they better understood how to use inquiry-based teaching methods in the classroom.

Increases in teacher ratings of their sense of how art and science complement each other approached, but did not reach, statistical significance.

There were no significant increases in teacher ratings of changes in their personal network of educators regarding inquiry-based learning, nor in their comfort level with teaching science in the classroom. Given the short training time, it makes sense that participants didn't change their feelings about teaching science but did come away with a stronger perspective on the process.

Post-workshop descriptions of the relationship between art and science differ from pre-workshop descriptions in that they are more detailed and specific, and more frequently acknowledge that the necessary thought processes for each are similar.

Teachers' pre-workshop explanations of inquiry-based education are largely on target; post-workshop responses are more detailed and descriptive. Respondents report that the workshop helped make this method more clear.

Most difficulties with using an inquiry-based method identified by teachers before the workshop address their own level of understanding and experience with the method. Most teachers felt that these and other concerns were addressed by workshop content with the primary exception of time constraints in the classroom.

Reactions to the Workshop

Teachers are enthusiastic about the value of the workshop, each of them rating it as *valuable* to *very valuable*. Most effective, in their opinion, was learning the process of inquiry itself and having time to practice it with hands-on activities.

Most recommendations for improvement touch on logistics such as offering the workshop earlier in the school year or adjusting the daily schedule. Very few comments focussed on content; those asked for *all 12 steps of the Process Circus*, and *more content behind the inquiry lesson*.

All participants state that the workshop gave them tools and/or ideas that they can use in the classroom right away. Several teachers listed the *inquiry method* or *questions*, more specific responses mentioned the *journal*, and the *I notice, I wonder* tools.

Profile of Workshop Participants

Three teachers in this group were the only representatives of their schools. Ten came with one to three other teachers from the same school. Four participants teach multiple grades starting with pre-K or K, to grades 5, 8 or 10. Other teachers teach a single grade with the highest concentration in 4th grade (three).

The minimum number of years teaching among members of this group is three years. Seven participating teachers have been in the classroom for ten to 30 years. Though only one workshop participant attended last year's FMM Inquiry workshop, seven report



having had other training in inquiry-based learning.

The amount of time spent on science in the classrooms of these teachers ranges widely from 20 minutes per week to 60 minutes per day.

Marketing

The most common way that these teachers found out about this workshop was through the District Science Support staff (four). Kurt Gross was the contact for three teachers, and local principals the contact for another three.



Summary of Focus Group Findings

Eight teachers, one Met Museum Explainer, Kurt Gross and the evaluator were present for this focus group discussion.

Success with Inquiry Method in the Classroom

Most teachers in this group had tried to use the inquiry method, at least a little bit. Every one of them had a good experience with it. All were enthusiastic about method's ability to excite and engage the students while making their learning both deeper and more meaningful. Teachers also commented that the method made their job easier while improving their teaching and the students' learning. All agree that science and art are especially important for English language learners, and that the inquiry method is supportive of these students.

- The students enjoyed this because they came up with their own focus questions even though other teachers say that they are too young... – yes they can come up with their own focus questions... I wrote down all their questions, then we talked about which ones were investigable, etc. They had a good time, they felt more relaxed, and they still wrote very good claims of evidence when we finished up the lesson. They really love the *I see I wonder* thing
- The science kit that my 1st grade class is using is heavily centered around animals... With animals can practice observations
- Now after the workshop, I can encourage the kids to observe and ask questions... use science journals... before I was going very quickly through scientific lessons, now one thing or activity like tops can take up a whole hour. It takes some of pressure off me and the kids get a lot more depth of knowledge.
- Science is my hardest area... that's why I took this class... it doesn't come naturally to me... the class really helped me to probe and question the kids more... this time I tried the inquiry method... and the questions that they asked, I was really flabbergasted!... I had more fun watching them... Asking the questions [made] a more exciting atmosphere for the kids, and it was much more meaningful for them. It was just this little thing, but I thought, ok I got my feet wet, and I was very pleased and happy with the results.
- I had the kids write questions in their note books, when the shy ones heard the questions that other students had, they said, "hey I wrote that down too," and, "I want to know..." Yes it helps them come out of their shell, by the end the shy ones are coming up to write their questions too.
- You talk about kids being engaged! Being active participants with the content, that's what's so wonderful about science, it is engaging! Whether you're an English language learner, or a special ed. student or a GATE student, it hooks every one of them.
- For English language learners, this is their time to shine.



Even With Time Constraints in the Classroom – Workshop Helps Teachers To Be Most Effective

While time constraints continue to be a big concern for public school teachers, they agree that the workshop made them better teachers and gave them effective tools such that they can make the most of the time that they do have for instruction. Some teachers are developing creative ways to use the inquiry method even with shrinking instructional time for science.

- So now I'm trying to think out of the box a little bit... I can make a center and put up a big paper and have an *I see I wonder*... maybe I can put a few of these things out, like batteries, and have the write in their journals... what they noticed... Because there'll be less time for instruction.
- And whether or not we have a lot of time, at any particular subject area, by attending this you learn to be a better teacher across the board with questioning that can be incorporated for any subject matter. So thank goodness we do have this because now we'll be able to get more bang for the five minutes that we'll be able to teach it. I can't even imagine what it's gonna be like now. [With less time available due to *redesigning our day* mentioned above.]
- Discussion of including scientific vocabulary on a word wall in the classroom: animal and process vocabulary, kids referred to it all year long. Discussion of integrating science and language arts and social science in these ways and using journals.
- Coming to things like this and just having the conversation helps so much, you have the pedagogy and the understanding of inquiry and how important it is to learning. When you have that, you can more easily tweak how you're going to do that in the classroom.

Value of Professional Development

Throughout the focus group session, teachers were enthusiastic about the value of this and other workshops like it.

- These kinds of things are so valuable. I've been lucky to be involved...and I think they made me a better teacher over all, I just have better everything, I have better classroom management, I'm not as nervous about things, I feel that doing these different staff development have helped me personally to grow, it's been very beneficial.
- Sometimes teachers feel like this is gonna be another thing on their plate, like "something *else* to do." But every experience that I've had... I'm like why aren't more people doing this, they're paying me and they're teaching me and they're coming into my classroom and giving me materials and support and video tapes. What's wrong with people? I can't understand why they're not utilizing these programs!

Art and Science

All teachers agree that art is an important complement to science and all other curricula; they are frustrated with how little support they have for teaching art. One participant discussed at length how the workshop and a subsequent visit to the Impressionist exhibit at FMM inspired her to creatively include art into her fourth grade history curriculum.



FFM as a Resource in the Community

The FMM Inquiry Workshop and this follow-up meeting effectively help *FMM develop and maintain a presence as a resource in the community* per pre-set goals of the workshop. A lively exchange of ideas and resources took place in this meeting and promises to continue. These participants are eager to communicate with FMM about their classroom experiences with the inquiry method this fall.

Advice for Future Workshops

These teachers make several recommendations for future FMM workshops.

- Offer pedagogy workshops earlier in the school year, as early as the second week of September, but be careful of fair days and other conferences.
- Include some content materials on the side, during pedagogy workshops in the fall.
- Offer content oriented workshops during the summer; use the inquiry method in that context.
- For September workshops, contact private schools in May, and public schools at the very first of the school year. For best results, reach directly to the principals (private school) and to teachers (public school).



Survey Results Comparison of Pre- and Post-workshop Responses

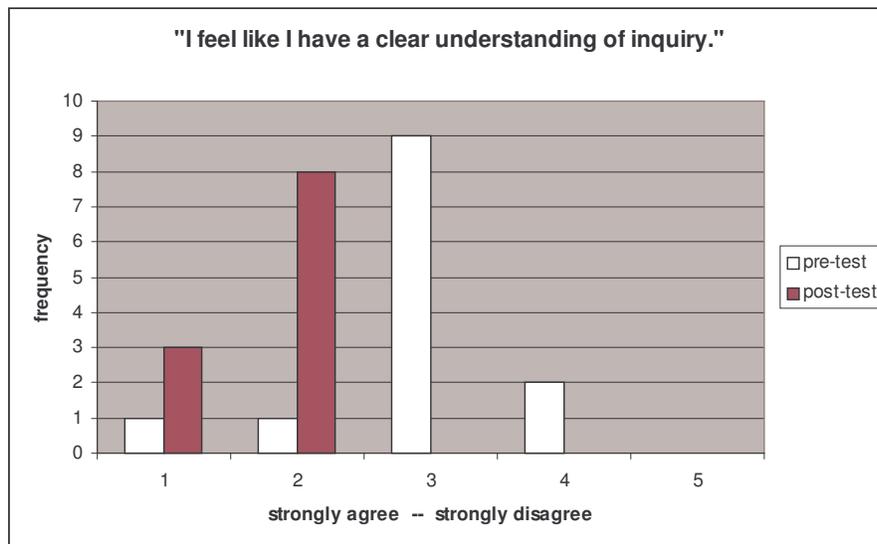
Five Likert Scale questions and three open ended questions were asked on both the Pre-workshop and Post-workshop Surveys. Responses to the Likert Scale questions wherein respondents rate how strongly they agree or disagree with a given statement are statistically tested to measure significant changes as a result of participating in the workshop.

Statistically significant differences are found in responses to two of the five Likert Scale questions. Teachers felt more clear in their understanding of inquiry, and felt they better understood how to use inquiry-based teaching methods in the classroom.

Increases in teacher ratings of their sense of how art and science complement each other approached, but did not reach, statistical significance. There were no significant increases in teacher ratings of changes in their personal network of educators regarding inquiry-based learning, nor in their comfort level with teaching science in the classroom. Given the short training time, it makes sense that participants didn't change their feelings about teaching science but did come away with a stronger perspective on the process.

I feel like I have a clear understanding of *inquiry*.

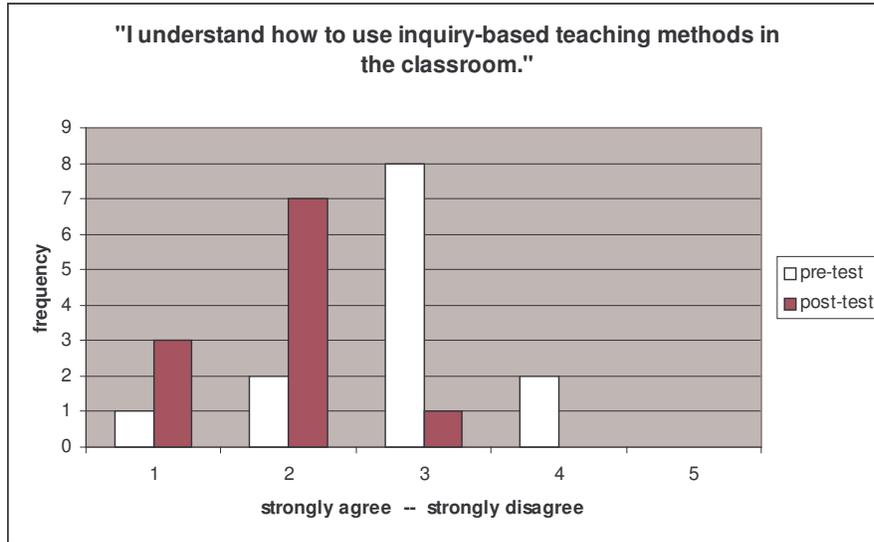
Teachers felt significantly more clear in their understanding of inquiry as a result of the workshop (t=9.04, df=10, sig=.000).





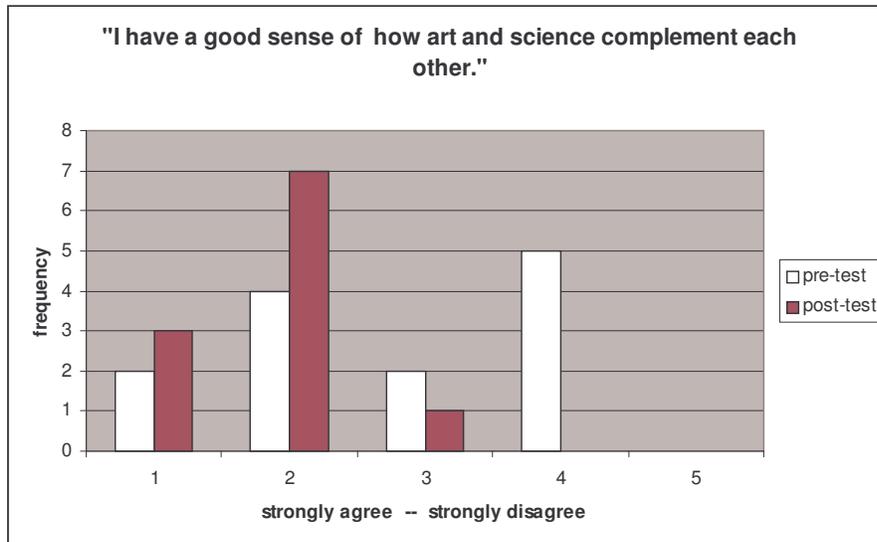
I understand how to use inquiry-based teaching methods in the classroom.

Teachers felt they significantly better understood how to use inquiry-based teaching methods in the classroom as a result of the workshop ($t=4.08$, $df=10$, $sig=.002$).



I have a good sense of how art and science complement each other.

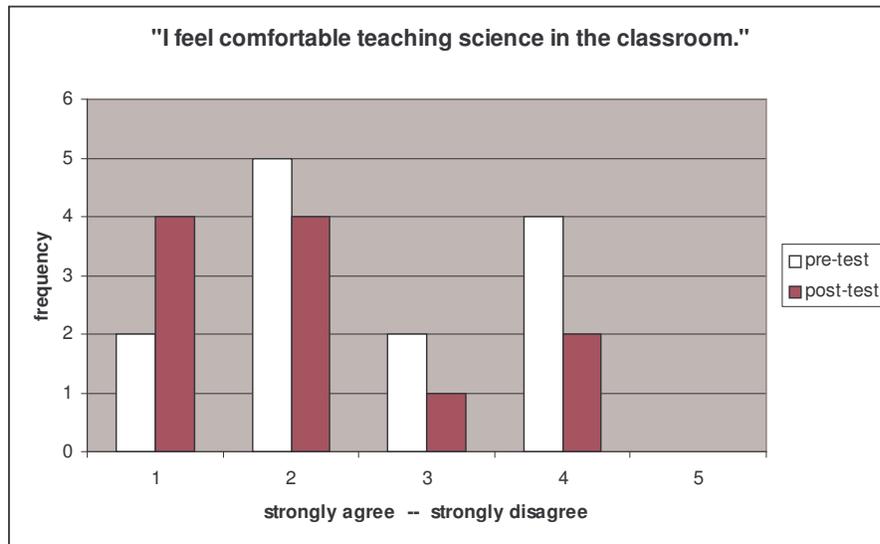
Increases in teacher ratings of their sense of how art and science complement each other approached, but did not reach, statistical significance ($t=1.99$, $df=10$, $sig=.074$).





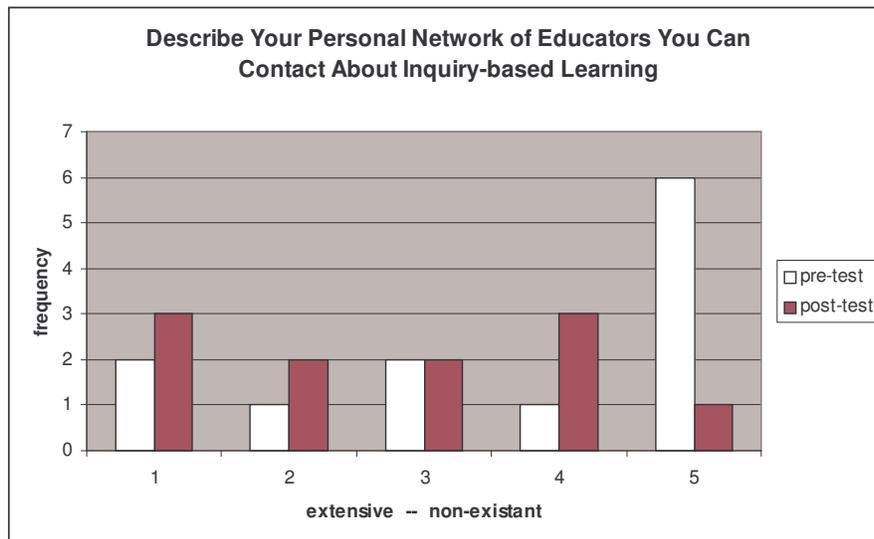
I feel comfortable teaching science in the classroom.

No statistically significant increase in agreement is measured for this statement.



How would you describe your personal network of educators whom you can contact about inquiry-based learning?

No statistically significant change is measured for this point.





How would you describe the relationship between art and science?

Pre-workshop

- Neither know no boundaries
- Often overlooked! The more I've learned (about science), the more I've recognized the art within all.
- Background knowledge & observation (careful) are needed for both
- Art & science are both hands-on teaching. Students take an active part in their own learning.
- Art & science both require thinking "out of the box." You take risks to make studies in both art & science.
- Except for geometry, I have always held them as separate entities.
- I have no idea
- Not quite sure (2)
- ?
- no answer (2)
- Art involves the opportunity to practice scientific process skills, i.e., observation, prediction, hypothesizing, investigating, making conclusions & communicating

Post-workshop

- They touch so many modalities of learning
- The thinking skills are similar.
- Background knowledge & observation (careful) are needed for both.
- Art & science support critical thinking, creativity & exploration.
- Both disciplines require one to be a careful, thoughtful, questioning observer.
- The process skills are a part of Art & Science - VTS supports observation & careful looking & higher level or critical thinking. The two disciplines are symbiotic.
- They compliment each other - both work with the inquiry method!
- Art is a form of science. We saw part of that through VUE. I think people who appreciate art can learn to appreciate science because they go hand-in-hand. Most of the process skills are used.
- After being in this workshop I can see how the skills are being used within one subject. Can cross over to another subject.
- Much art & much science use the same physical phenomena (i.e. spectral wavelength) as close entities which can work together



Please complete this sentence. To me, *inquiry-based learning* means...

Pre-workshop

- leaning by doing & asking questions
- learning through all modalities by being able to question the whip
- finding out through asking more than yes or no questions
- using questioning strategies to guide learners to meet specific objectives
- gaining a command of guiding the inquisitiveness, the questioning of learners
- not directing kids to a "one answer" lesson. Being open to different angles, roads to a bigger understanding of new things.
- questions are asked, information is given & looked for, answers are found to create understanding & further questions
- to encourage kids to ask question & help them find the answers.
- extreme student directed learning
- knowing which questions children can investigate & knowing how to reword their questions to make them investigate. Questions are more about their curiosity
- placing the responsibility of learning on the child by creating questions that promote higher level thinking skills
- engaging student & teachers with interesting phenomenon where they can raise questions & plan investigations, resulting in learning content goals; process goals
- no answer (1)

Post-workshop

- taking time to observe a subject
- building content knowledge through questioning & investigating
- observing, questioning, investigating & communicating
- observation, questions, planning, interpreting, communication & hypothesizing. It's using all of these things when they are applicable to any given lesson.
- the ability to raise questions through doing an activity & planning & performing an activity to answer the question.
- Questions are asked, information is given & looked for, answers are found & given to create understanding & further questions.
- engaging learners with interesting phenomena, formulating questions from their observations, investigating through a plan to come to a conclusion & communicating understanding & asking more questions.
- Yes, this process is highly student motivated but teacher directed.
- guiding kids to ask questions they can investigate to a conclusion
- allowing children to explore, question, plan an exploration, and seeing what happens & to be able to communicate the results to others that then answer a new question
- Stretching-out the learning potential via critical inquiry. More than just playing.

If Is this different from what you thought before the workshop, please tell us how.

- I don't think I had a clear understanding of what the process was.
- Yes, I knew really nothing before (except from the articles we were to read).
- I have a better understanding of how to use each of the parts & how to tie them to other subject areas.
- Somewhat. It involves a variety of approaches to teaching but begins with questions.
- I wasn't expecting to be given so much structure & so many opportunities to practice it.
- I have a clearer understanding of the process of inquiry.
- Workshop has cemented many concepts for me. Inquiry is tentative & knowledge is always being refined.
- Somewhat. It is clearer to me.



What difficulties with using an inquiry-based teaching method have you experienced or do you anticipate? Did this workshop address your concerns? Did it raise other concerns?

Pre-workshop: What difficulties...

- Only ideas
- My lack of knowledge on the subject matter
- Lack of understanding & lack of practice
- I am not comfortable with science so I struggle with all aspects
- At times I am limited by my depth of content knowledge. This is true of many elementary teachers.
- Knowing how to make student questions & investigate
- Time issues; specifics on management
- possible uncontrollable classes
- I've been guilty of not designing enough questioning in my teaching, actually making my teaching more exhausting & less effective.
- Difficult to answer. I'm currently working at our museum. Not teaching
- ? (2)
- no answer (1)

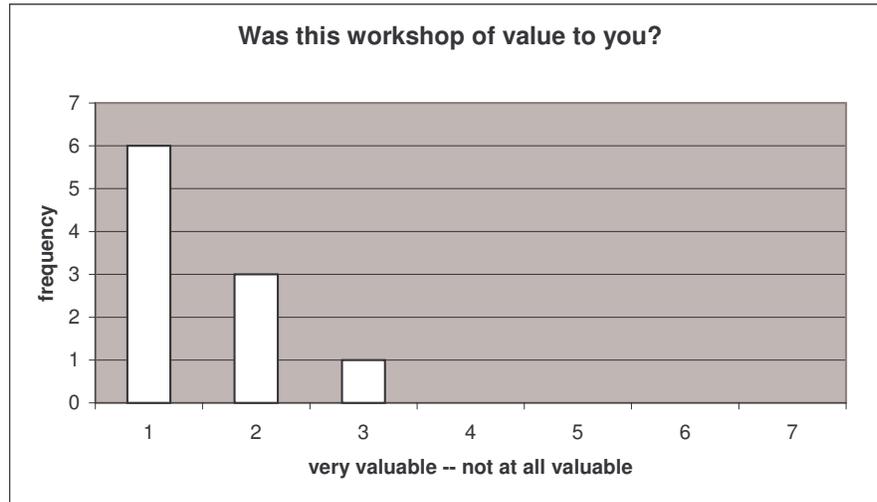
Post-workshop: Did workshop address...

- Yes, no. Very clear!
- Yes, this workshop helped address my concerns
- Yes, I am ready for my classroom. I will have to see how I do in my classes.
- Yes, it addressed my concerns. I wanted to know when to incorporate inquiry & how to organize it. This really helped.
- I still need materials but I look forward to acquiring them.
- It would be nice if more teachers could be trained on inquiry-based learning & that we could support each other.
- I am now more comfortable knowing that I will not have to generate worksheets in order to extend learning. I look forward to implementing the very non-labor-intensive techniques you've shared.
- Think (yes) I will try to integrate more science & art.
- I'm still concerned with the time constraints & what activities to use.
- Time constraints & curriculum demands. The collaborative nature of the discussions have given me ideas on how to address time & the integration of ideas across curricular areas.
- Not enough background knowledge in the subject area. No but it sounds like you will or are trying.



Survey Results – Reactions to the Workshop

Was this workshop valuable to you? Please circle one number on the continuum below.



What about this workshop was most effective?

- The process of inquiry itself
- Learning about the inquiry process & the steps involved
- The "hands-on", the experience, the exploration, ... we owned the investigations
- The hands-on parachute lesson let me put myself in the position of "student." I also enjoyed Fred's presentation on the components & organization of inquiry.
- The INQUIRY component - process & practicing it
- Learning how inquiry process works & the importance of getting students involved.
- It was great being put through the very processes we are expected to put our kids through.
- The hands-on activities were great. I learned a great deal about how important this process really is.
- The hands-on learning approach
- The collaborative nature of the work. The opportunity to build meaning through discussion & reflection time.
- Review of strategies used in good teaching. I liked rockets lesson to learn strategies at start of the new year with students. (High interest)



How do you think this workshop could be improved?

- Shorter lunch, start with continental breakfasts at 8 a.m. End the day around 3:00 or 3:30 p.m.
- Shorter lunch break
- Breaks in the morning & afternoon. 4:00 is too late to get out. I would have liked more info on actual activities I could do in the classroom. I think the starting time was perfect because you have participants that had to drive 45 minutes & an earlier start time would be very difficult.
- I like the smaller group size in comparison to last year's group. The pace was good. Lunch only needs to be 40 minutes and we could end by 3:30. We need regular breaks. Start time 8:30 a.m. Great job!!
- People involved - leave children at home - very distracting to have child going in & out
- Earlier in the school year. Add a little more on current exhibits.
- Keep up the great work! Kurt, you are a great teacher & facilitator!!! Thank you for all your hard work. This was VERY valuable. And the food was a great treat!
- I'd like to go through all 12 steps of the "Process Circus."
- Perhaps a little more content behind the inquiry lesson. Overall a very good workshop of teaching strategies. Perhaps begin earlier so as to end earlier (tired by afternoon). Thank you for content on tops lesson - 3rd day. Would love more.

Did the workshop give you tools or ideas that you can use in the classroom right away?

| | |
|-----|----|
| Yes | 11 |
| No | 0 |

If so, please describe:

- Yes, I just needed to make a plan.
- I'm not sure what my first inquiry unit will be but I will be planning it soon.
- How students can come up with good questions that they can use to investigate. I have more ideas how to make this happen.
- Inquiry questioning strategies can be incorporated in any curricular area at any time.
- Inquiry method - I need to try it ASAP.
- Having this will help students be more involved & take ownership of their learning.
- A journal can be a single page. Writing & discussion have been largely absent from a class I'm teaching. I will be able to use the "I-notice" & "I-wonder" stuff immediately.
- I am going to try an inquiry lesson with (Lighting a Bulb).
- As I work with teachers I can use the structures presented & be more aware of the process skills & inquiry strategies.
- Outline: observation, questioning, planning, interpreting, communication, science ideas for the students to follow while working. Also liked the "plan" strategy presented.



Is there anything else that FMM staff should know about this workshop?

- I hope we can continue with these workshops!
- Thanks for reinforcing good teaching strategies. Thank you. See TCI (history) uses VERY SIMILAR teaching strategies. I look forward to "content" workshops.
- Please provide ice for drinks.
- The Mediterranean food was very delicious. Let's study up on the 5th floor! Thank you!
- It was great.
- It was terrific. Thank you for all the hard work & planning. It was a refreshing learning experience all three days!
- Kurt is great! Very personable & easy to learn from.

Survey Results – Description of Participant Respondents

How many teachers from your school are participating in this workshop?

| Number of Teachers From Same School | Frequency |
|-------------------------------------|-----------|
| 1 | 3 |
| 2 | 3 |
| 3 | 6 |
| 4 | 1 |

What grade(s) do you teach?

| Grades Taught | Frequency |
|--------------------------------|-----------|
| pre-K through 10 th | 1 |
| pre-K through 8 th | 1 |
| Support Resource Teacher K-5 | 1 |
| "all grades" | 1 |
| 1 st | 1 |
| 2 nd | 2 |
| 3 rd | 1 |
| 4 th | 3 |
| 5 th | 2 |



How many years have you been teaching?

| Years Taught | Frequency |
|--------------|-----------------|
| 3 | 1 |
| 6 | 1 |
| 7 | 1 |
| 8 | 1 |
| 9 | 1 |
| 11 | 1 |
| 13 | 1 (as a parent) |
| 14 | 3 |
| 22 | 1 |
| 30, 30+ | 2 |

Did you participate in the FMM Inquiry Workshop last year?

| | |
|---------------------|----|
| Yes ("facilitator") | 1 |
| No | 12 |

Have you had any other training in inquiry-based learning?

| | |
|-----|---|
| Yes | 7 |
| No | 6 |

Inquiring Training Descriptions:

- TCI, history
- Student teaching through Fresno Pacific
- District hearings
- K-12 Alliance, district led monthly meetings
- Through school staff development
- Tulare City Schools Institute for Inquiry
- Exploratorium Institute for Inquiry & San Francisco Cal Tech Capsi Grant

How much classroom time do you spend on science?

| | |
|----------|---|
| per day | 60; 45 – 60; 30 (in minutes) |
| per week | 120; 150; 60; 20 (in minutes) |
| write-in | <ul style="list-style-type: none"> • As much as possible as a parent • 4 weeks a year/30 min. a day x 5 • I alternate 1/2 qtr. Science 7 1/2 qtr history • 3 weeks a quarter for 30 min. each day |



What barriers to teaching science are you aware of in your district?

- Time!
- Time, commitment of administrators
- Adequate time to fit in schedule & lack of time to prepare
- Time & lack of understanding of how to integrate science into language, arts & math
- Time! Standards based testing that allows that science is a standard but tests so much more on language & math
- science is de-emphasized in testing, therefore teachers are not educated in science & have to teach science.
- Direct funds for science, time
- Lack of supplies
- Not everyone is trained on the kits.
- None. Lack of supplies
- None at our school. But at low performing schools - reading/math ONLY have been strongly encouraged
- My district is very supportive

Survey Results – Marketing

How did you find out about this workshop?

| | |
|---|---|
| District Science Support Staff (Terry Sayre, 1) | 4 |
| Kurt Gross | 3 |
| Principal (1 cited a letter received by the Principal) | 3 |
| Administrator | 1 |
| Grossology opening | 1 |
| Collaborative effort between Fresno Met/Exploratorium & Tulane City Schools | 1 |



Focus Group Discussion Notes

How have you taken into the classroom what you learned at the workshop?

Several teachers reported that they had not been able to work any of the workshop material into their teaching because the workshop was so late in the school year.

In a unit about electricity we used the method by having the children come up with questions and using those to guide their process. The students enjoyed this because they came up with their own focus questions even though other teachers say that they are too young to come up with their own focus questions – yes they can come up with their own focus questions when you teach them what is a good question.

How did you teach this? I wrote down all their questions, then we talked about which ones were investigable, etc. We did a lot of the *I see, I wonder...*

Did you teach this unit last year? Yes, the same content, but differently. They had a good time, they felt more relaxed, and they still wrote very good claims of evidence when we finished up the lesson. They really love the *I see I wonder* thing.

Where else did you use this method? In social studies and in math.

Was it equally effective? Yes, I think you could tweak it to work with about anything... before I always used the K.W.L., but never got to the L. Now I like letting them ask the questions and they were ok with the *I wonders* that we couldn't answer. I always write down their question [even if off target]... I validate their questions... I always write their name next to their question...

Is this a new/additional way for them to participate? Yes (second grade).

My situation is different, I bring many different science resources and manipulatives to explore as many different scientific phenomena... as much as I could pack in. Now after the workshop, I can encourage the kids to observe and ask questions... use science journals... before I was going very quickly through scientific lessons, now one thing or activity like tops can take up a whole hour. It takes some of pressure off me and the kids get a lot more depth of knowledge.

Can you apply this to all ages, do you have to vary it? No, [you don't have to vary it], it's matter of having them ask the questions.
(grades 10-2, home school students that come into his classroom)

The science kit that my 1st grade class is using is heavily centered around animals, I felt like I couldn't get more of an inquiry lesson out of that because they are living things... can't ask what will happen when you take a fish out of water and then watch it die. I hope next year when we get into solids and liquids I'll be able to incorporate more of the inquiry.

Suggestion by other teacher... With animals can practice observations – oh yes... short discussion...



Science is my hardest area... that's why I took this class... it doesn't come naturally to me... the class really helped me to probe and question the kids more. I've done this activity before, dropping water onto coins, but this time I tried the inquiry method... and the questions that they asked, I was really flabbergasted! One kid actually thought that "on the head side it sticks up more so it would hold less water than the other side." That's really surprising because they're just second graders. I had more fun watching them... we've always estimated [how many drops would fit on the coins], but asking the questions was a more exciting atmosphere for the kids, and much more meaningful for them. It was just this little thing, but I thought, ok I got my feet wet, and I was very pleased and happy with the results. Put questions up on the white board. (grades 1 and 2)

I had the kids write questions in their note books, when the shy ones heard the questions that other students had, they said, "hey I wrote that down too," and, "I want to know..." Yes it helps them come out of their shell, by the end the shy ones are coming up to write their questions too.

Many comments on the survey mentioned time as a problematic constraint. After using the method a bit, do you have any other comments or ideas about time being a constraint?

I'm even more concerned about time now because they are redesigning our day so that there's not a whole lot of time for science. So now I'm trying to think out of the box a little bit... I can make a center and put up a big paper and have an *I see I wonder...* maybe I can put a few of these things out, like batteries, and have the write in their journals... what they noticed... Because there'll be less time for instruction.

Discussion of using kits and how to get them for a longer time period. The home school teacher has been asked to create kits. One teacher volunteers that kits in their system are well supplied and lend themselves to inquiry.

Kids still need time to pull it together and make meaning.

And whether or not we have a lot of time, at any particular subject area, by attending this you learn to be a better teacher across the board with questioning that can be incorporated for any subject matter. So thank goodness we do have this because now we'll be able to get more bang for the five minutes that we'll be able to teach it. I can't even imagine what it's gonna be like now. [With less time available due to *redesigning our day* mentioned above.]

My class is predominantly English language learners... beginners. All my students did really well... they learn a lot of vocabulary, they wrote, so it didn't matter that they-it didn't hinder them, they had to explain things to each other, they had to use their language, so science is really important for all kids, but it's made a big difference in my class of English language learners.



Discussion of including scientific vocabulary on a word wall in the classroom: animal and process vocabulary, kids referred to it all year long. Discussion of integrating science and language arts and social science in these ways and using journals.

Coming to things like this and just having the conversation helps so much, you have the pedagogy and the understanding of inquiry and how important it is to learning. When you have that, you can more easily tweak how you're going to do that in the classroom.

Natural connection between *I see I wonder* with language arts work. Modeled and interactive writing exercises can use science-driven content.

You talk about kids being engaged... being active participants with the content, that's what's so wonderful about science, it is engaging! Whether you're an English language learner, or a special ed. student or a GATE student, it hooks every one of them.

For English language learners, this is their time to shine.

Comments about materials constraints?

Most comments address district system of kits. Private school teachers have no difficulty with materials. Kurt mentions that the Met occasionally has a windfall of resources and encourages teachers to contact him with their needs. Kurt also talks about RAFT in San Jose as a good source of cheap supplies. Love Inc, in Tulare is a similar resource. Discussion of Fresno's Scholastic warehouse sale and book fair.

Ongoing Contact Between Teachers and With the Met

One of the stated goals of the workshop was to... *Develop and maintain a presence as a resource in the community.* All focus group participants are willing to respond to an inquiry from FMM about their progress with workshop material and the inquiry method during the fall semester -- an email contact during early November.

Feedback about the workshop: how can it be refined and made more accessible to teachers?

Offer it earlier in the school year, during the fall.
Discussion of timing... end of September, early October. As early as second week of September, but careful to avoid Fair Days in the small communities surrounding Fresno (usually the second Wednesday in September). Also be sure that there are no other conferences that week.



Discussion of the workshop meeting three days in row vs. three days over three weeks. Spreading workshop days across three weeks might be easier for teachers to be away from the class room, but it's harder on workshop participants who lose time to review and lose momentum with the course material. Most agree with the latter and recommend a using a schedule of three days in a row.

Best time to reach out to teachers? In the beginning of May for a September workshop (private school teachers). Public school teachers report that their system works faster so having it at the very beginning of school is good – to the principal. But it's probably best to reach the teachers directly.

Discussion of other teachers who resist or just don't go to professional development workshops, or miss out because the news doesn't reach them...

These kinds of things are so valuable. I've been lucky to be involved...and I think they made me a better teacher over all, I just have better everything, I have better classroom management, I'm not as nervous about things, I feel that doing these different staff development have helped me personally to grow, it's been very beneficial.

Sometimes teachers feel like this is gonna be another thing on their plate, like "something *else* to do." But every experience that I've had... I'm like why aren't more people doing this, they're paying me and they're teaching me and they're coming into my classroom and giving me materials and support and video tapes. What's wrong with people? I can't understand why they're not utilizing these programs!

Discussion of making more content available at future workshops, even if it's a passive approach of having materials out on a table with a copy machine nearby.

Discussion of Exploratorium summer content workshops using the inquiry method...

I'd like to see more of that for our teachers here. Make sure that content is in the form of simple things, easy materials that everyone as access to.

Kurt explains that the Met has heard this before and will start summer workshops, but probably not this summer because of renovations... discussion of upcoming renovations at the Fresno Met.



Attention to the Nexus of Art and Science

After the workshop I looked at the impressionist exhibit... back in the classroom we had a great time we were studying missions, so we did watercolors of missions and we had a museum walk in our classroom. Now we can use *I wonder* what they were thinking when they chose those colors... so now I think we could use the *I wonder* chart with the art work. Then we read Patty's Doll, a story about a girl in the Donner Party. So now we're sewing dolls, it's very labor intensive and we're not done yet... but they had the best time and some of the better seamstresses were the boys... and they say, "in and out..." as they stitch [animated demonstration], and he was the expert. I don't think I would have done that if I hadn't been inspired by the art. And for the sewing they had to do math... make symmetrical shapes by cutting something on the fold... the only thing I did for them was the hot glue. I probably only spent five dollars... a yard of calico from Wal-Mart... clothes pin dolls...

Discussion of the benefits to students of including art and music in their curricula; frustration with current system...

Kurt describes a new FMM program of outreach to schools; a lab on wheels which includes art and science... available to schools in the seven counties of the valley on a fee basis.

Discussion of other local resources.