

HOW STEM AND SCIENCE DIVULGATION CONTRIBUTE TO BUILD A “COOL SCHOOL”

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Goals.

- To know :
 - Student's informal expressions meanings in formal educational terms.
 - Qualitative evaluation.
 - How STEM and Science Divulgation (SD) influenced their expressions.

Who we worked with?

- 27 10_{th} Graders.
 - Beginning their highschool.
 - Supported by UNAM.
 - Charlas en el aula (“talks in the classroom”)
 - Feria de ciencias y congresos SI (Two Scientific investigation Congresses each year)
 - Visitas guiadas (visits)
 - Jóvenes hacia la investigación (youngsters investigators)
 - Veranos de la investigación (Scientific summers)

How did we work?.

- We talked about science.
 - 400 little science doses (400 pequeñas dosis de ciencia). UNAM 2007
 - Scientific journals.
 - Scientific movies afterschool.
 - Talks by Top level Mexican scientifics.
- We always used computers and robotic devices to explain/understand the scientific principles.
 - Earthquakes, Ergonomics, Communications (rahp, deaf)
- We took robots to school.
- We evaluated impact on their expressions.

Why is it important?.

- Through SD, Common people:
 - Gets to know the universe.
 - We are stardust! (While seeing “cosmos” by Carl Sagan)
 - Shares the power that science grants.
 - It is aliveeee! (Scientific Congress, CUAM, México)
 - Change what they think about science and basic research.
 - How come they have a car..... (at Ensenada, México)
 - Acquire consciousness about risks and contributions of science.
 - Fights against the unknown and uncertainty by knowing that not everything is absolutely incomprehensible.
 - No maaaaa! (Realy?....)

Daniel Raichvarg, “ savants et ignorants”

Moreover, watch this. (phases of learning).

- The people experiments astonishment caused by a fact or a situation and demand an answer for it.
- That demand, generates in them the need to know the meaning of the fact or situation by analysing it, remembering prior experiences , researching in books or asking another people.
- When they explain and understand the fact or situation, they experiment calm and satisfying feeling
- De la mora (2003)

Learning Facilitators.

Did SD help?

- Academic self concept.
- Motivation.
- Studying Strategies.
- Attendance.
- Previous knowledge.
- Social status.
- Family environment.
- Attention to student's interests.
- Course complexity.
- School conditions.
- Institution support.
- School environment.
- Teacher-student relation.

Castejón, Pérez (1998)

Evaluation

(3 questions)

- Write down a feeling that you get when you know that you are going to school
- Think about what have happened in tech. Class until today, now, write down which of those things should happen always?
- Think about what have happened in tech. Class until today, now, write down which of those things shouldn't happen ever again?

Question 1

- Divertido, curiosidad, interés, dolor, angustia, aprendizaje, ansiedad para continuar, gratitud, confort, felicidad, asombro, intriga, Pereza, Desestresante, entusiasmo, indiferencia, gozo,

Question 2

- Interacción, trabajo en equipo, libertad de elegir, autonomía de decisión, dinámicas, compañerismo, propuestas propias de proyecto, información que sea aplicable, diálogo entre alumno y maestro, diversidad de temas, interrelación de la informática con todo, prácticas, que el profe siga enseñando con ejemplos de vida diaria, que use un lenguaje que nos hace sentir cómodos y con respeto, que el profesor se interese por nuestra actitud, debates,

Question 3

- Tomar lista al inicio de clase, desviarnos del tema, usar el blog para publicar tareas, que otros alumnos dañen el teclado, impuntualidad en la publicación de rúbricas, que sean solo 3 horas de clase semanales, no permitir que los alumnos se expresen ampliamente durante sus exposiciones, incertidumbre en las fechas de entrega, que sea tan estricto, que no sea tan abierto a las propuestas de los alumnos, que la gente hable sin tomar turno, que el profesor interrumpa su clase por que alguien mas está hablando, que no se vean temas de física, exámenes, que alguien no trabaje en el equipo, que haya tanta presión,

Results.

- Relations between answers and learning facilitators were established. (see wiser.pdf file)
- Interview with students
 - Compare previous and recent classes, which ones do you like the most? (97% recent)
 - Explain your answers (3 students were asked to)
- Most answers emerge from the new model students said.
- Students that didn't get good grades improved significantly (fire extintors) when teachers analyzed their effort and knowledge from the project.

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