Title of Session: Project Based Curriculum
Moderator: Chris Aguirre
Title of File: 20060417pbc
Date: April 17, 2006

Room: After School Online

BJ: Welcome to the Problem Based Curriculum discussion, everyone!

BJ: we usually start the discussions with introductions

ChrisA: My name is Chris Aguirre and I am the Director of Career and Technical Education for the Kodiak Island School Borough District

BJ: please tell us where you are located and what you teach or hope to teach

JeffCoo: I'm on Helpdesk here, involved with education for 15 years, I'm in Forest Grove Oregon.

MaryannA: I am Maryann Angeroth and I am a tech consultant for school districts in southwest Iowa

ChrisA: Ok then lets get started

ChrisA: Does anyone currently teach a problem based course?

MaryannA: No but I help teachers who do

ChrisA: that's great what kind of things are you doing in that process?

NatalieSc: Hello I don't know if I am at the right spot....problem based curriculum?

BJ: yes, Natalie

ChrisA: yes you have found it

NatalieSc: Yea! I am a middle school math teacher and using Tapped in for a course towards my masters in education

ChrisA: Natalie do you currently teach a course that you use this kind of method

ChrisA: Well I have been in CTE for the past year and Career and technical educaiton is a pretty easy subject to base on a problem

NatalieSc: In math we try to apply all the problems to every day life to make it something that the kids can relate to.

ChrisA: I currently am finishing off the curriculum for a construction course that creates a Green house to cover the NCCER curriculum requirements

ChrisA: that's great Natalie

KatarinaF: What is NCCER?

MaryannA: Iowa is getting involved with William Dagget's Rigor and Relevance Framework as we are moving toward high school reform. Part of his work encourages teaching using real world situations and solving real problems

ChrisA: http://www.nccer.org/index.asp

ChrisA: it is the national center for construction education and research

ChrisA: it took me a while to get it out sorry

NatalieSc: problems must relate to the students to get them engaged. For example, instead of just calculating percentages, I will have word problems were the kids are buying a CD and it is on sale. Find the sale price. Or calculate the tax.

ChrisA: anyway we have been using this kind of model for awhile

ChrisA: For example in welding we build a boat based on a local design

ChrisA: that project is mentored by a local boat builder and the product is raffled off at the end of the year with the proceeds wrapping back into the program

BJ: cool, Chris!

ChrisA: the problem in that case would be: Build a boat that would be useful in this environment and marketable when finished

ChrisA: pretty tall order when you stop and consider Kodiak is a fishing town that prides itself on boat building

KatarinaF: So to my understanding, this is a rationale for the student's to use what you have taught in their own lives instead of wondering why this is important to them

ChrisA: Now that type of project doesn't seem very relevant to academic subjects

ChrisA: yes I would say that is correct Katarina

ChrisA: it's been the academic wrap that makes the project really stick

NatalieSc: It must be relevant or else the kids don't see why they need to know it.

ChrisA: students in that case build a book about their experience including blueprints and diagrams of parts they fabricate

ChrisA: Natalie I would agree with you

KatarinaF: Natalie. . . I remember feeling that way when I was learning algebra

ChrisA: relevance is the key to any problem offered at the core of any subject

ChrisA: without that relevance students find no meaning in what they are attempting to do

KatarinaF: If someone would have related it to something that meant something important to me, my outlook would have been more positive

NatalieSc: exactly

ChrisA: Ask yourself this how many problems are you doing that actually create an artifact or touch the outside world in some meaningful way

NatalieSc: So, in my math class this is what I strive to do... use examples that have to do with junior high students.

ChrisA: it's a good question when you stop and think about it because so much of education is built on getting to the next step but where in education do you tell a student where that "next step" is leading them?

KatarinaF: very cool. I am Pre K through fourth so the relevance is immediate. (i.e. you need to learn your letters to read!)

ChrisA: I think you would strive to give your students the "why" and "where" of the math they are studying

KatarinaF: wow Chris! That is a point that I need to take to my teachers. And keep in mind for my own teaching

MaryannA: The George Lucas Website has some good videos of teachers using problem based learning. http://www.edutopia.org/

ChrisA: if you do that if you give them those things you allow them to transfer the knowledge to their needs

ChrisA: That is my personal definition of learning: The transference of knowledge to my personal goals and needs

KatarinaF: And set them up for problems they might have in the future.

ChrisA: hey great resource thanks

ChrisA: I will check that out

DavidWe: There's a quite good FREE magazine that they publish "Edutopia"

ChrisA: I know there are a few people listening could any please share a project they are doing that has a problem embedded in it?

MaryannA: Yes the magazine is good and available paper or online

ChrisA: We have a space port on the island

NatalieSc: Edutopia has great reading on emotional intelligence as well which

KatarinaF: emotional intelligence?

ChrisA: I am thinking about finishing a project I titled "rocket science" that explains thrust, gravity and trajectory for 8 grade students

NatalieSc: If we can get kids to understand their feelings and emotions and interactions with others, the research says there is an indirect tie to improved academic performance

MaryannA: I have some middle level math teachers who are doing an architect project with their students. They have access to local architects as mentors

ChrisA: the problem they would face in the class is how to elevate a common object (in this case a Lego man) to 200 feet

ChrisA: wow great project Maryann

NatalieSc: I would love to have an architect talk to my students about scale factor!

DavidWe: My sister's an architect

ChrisA: I agree Natalie that is what its going to take

KatarinaF: these sound like awesome projects! I wish I had teachers who cared about the material, and how they presented it to me.

MaryannA: I have another school districts that will have their students podcasting and vodcasting problem solving activities next year

ChrisA: Ya I agree Katarina I think that architectural project sounds great I was wondering is it possible to see the project or lesson plan for that?

ChrisA: that brings up an interesting set of problems

ChrisA: we too have looked at that situation of producing content for public consumption

ChrisA: we sit on an island that is serviced by a cable company but have no local news station

KatarinaF: In the curriculum for middle/high school 6-12, is there managing money, and balancing a checkbook?

MaryannA: I could ask the teacher and post it in the files in my office here at tapped in

ChrisA: we are toying with the idea of using public access to produce stories about the school district that are shot and edited and produced by students

ChrisA: As the conversation kind of winds around I think it is important to identify what are the characteristics of a good problem?

MaryannA: This teacher is involved with a professional development project that is focused on using the NCTM process standards, one of which is problem solving

DavidWe listens more closely as he will be at NCTM meeting in 2 weeks

MaryannA: Katarina, Money issues are usually taught in a business class in hs

JulianneP: a good problem would have to be well stated, correct?

KatarinaF: thanks.

ChrisA: yes it would need to be clearly stated with goals and parameter

NatalieSc: If we can successfully teach students strategies to solve problems..... how to approach, estimation, reasonableness.... our students will be better prepared to face the challenges of the business world

JulianneP: it would have to include elements that point students in the right direction towards answers

ChrisA: if you don't do that what I have found is students will use the shortest path method to solve the problem

KatarinaF: YES!!!

JulianneP: Natalie-that is so true!

ChrisA: if you did that Julianne would you then be taking away their chance to solve the problem from scratch

KatarinaF: Natalie. It is not so much the actual math that was hard for me, but how to go about solving it was

NatalieSc: Many students calculate answers that do not make any sense...... calculation without an assessment of reasonableness.

JulianneP: I see what you mean, but if you give them too broad of a problem they may end up in the wrong direction, and you won't stay on with the goals of the lesson

ChrisA: that is a great observation I would ask how do you teach students to solve problems? and can you do that while meeting your other o**BJ**ectives

JulianneP: I am a respiratory therapist in a hospital in Baltimore. I do continuing ed (professional development).

KatarinaF: I think teaching strategies to solve prob.'s is the ONLY way to reach your objective.

NatalieSc: Students must be taught to solve problems..... and yes, Chris, it has to be interwoven with the other objectives..... we are building a tool box for the kids..... how can I approach this problem

JulianneP: One of our biggest goals is creating learning activities for adult learners that fosters their critical thinking abilities. every day they are faced with problems they have to solve--it doesn't mean they're good at it!

KatarinaF: how can the student solve if they don't know how?

ChrisA: I agree Julianne

MaryannA: I have a school district that uses Polya's 4 steps to problem solving to teach kids how to solve not only math problems but problems in other curricular areas too

JulianneP: professional development using PB learning style will make them better people and better professionals

JulianneP: and give them real world tools--but I don't need to tell you guys that

NatalieSc: what is PB learning style?

ChrisA: but I am wondering what does it take to honestly create problem solving skills that can be flexible and applicable to all problems?

JulianneP: Problem-based

ChrisA: In my opinion Natalie a Pb leaning style is not based in modality it is based on the ability to transfer

JulianneP: I think people need to learn how to tell what they DON'T know...then they can learn how to discover those things on their own

KatarinaF: Maryann what are those four steps? and what other curriculum areas do they fall into.

ChrisA: by that I mean you can approach problems from any learning modality but you will ultimately need to be able to transfer information yiou leaned in one place to another

JulianneP: the real question is--what makes a good problem-solver. you can then teach to that ideal

JulianneP: Does anyone have a resource for Polya's 4 steps? (Maryann)

NatalieSc: Polya's approach... read and understand the problem, plan how to solve... choose strategies, solve the problem, check your work

DavidWe: Here's a web page on "How to solve it":

ChrisA: but I am wondering what does it take to honestly create problem solving skills that can be flexible and applicable to all problems?

DavidWe: http://www.math.utah.edu/~pa/math/polya.html

JulianneP: seems logical-but very broad

ChrisA: what are the characteristics of good problem solving?

KatarinaF: Thanks David. I figured those were the steps/ just not sure who Polya was.

NatalieSc: We've got to teach them the strategies... draw a picture, use an equation, look for a pattern, work backwards, make a table. ESTIMATE a reasonable answer

ChrisA: I would contend that good problem solving skills are built on three foundational concepts

MaryannA: Katarina The four steps are: Understand the problem, Devising a plan, carrying out the plan, look back. You can find more information at: http://www.aea13.org/PROGRAMS_SERVICES/SchoolTechnology/Technology/ProblemSolvingWeb/index.htm

KatarinaF: Thanks! this is all awesome to take with me on my first year of teaching.

JulianneP: Chris- good problem-solving skills seems like a tacit knowledge--we all know it when we see it, but can't articulate it

DavidWe . o O (Polya - famous Hungarian mathematician - 1887 to 1985)

ChrisA: I would respectfully disagree

ChrisA: I say good problem solving skills start with three basic things

DavidWe checks the dates

BJ listens to the three skills

ChrisA: you need to create environments that allow students to get things wrong

ChrisA: it goes to the adage that in order to get things right you need to get the wrong first

MaryannA: Chris,

JulianneP: good idea, especially with adults--they're not used to a safe environment to be wrong

BJ . o O (kids aren't used to it either!)

DavidWe . o O (Mistakes happen; LEARN from them)

JulianneP: especially when they are wrong in front of their co-workers....but it's so important, I agree!!

MaryannA: That is why Polya is so interesting. He suggests that we encourage students to guess and use the look back phase to see if the answer is reasonable

DavidWe nods

DavidWe: intuitive ability is real - but not always correct

JulianneP: AMEN David!

KatarinaF: I know too many people who can NEVER be wrong in their own eyes. It is a terrible habit to form. Open mind is Key

ChrisA: Second: students need a broad and flexible definition of failure

BJ listens to Chris' two other skills

JulianneP: Plus, what's right today may be wrong tomorrow

ChrisA: if your definition is too narrow then the slightest set back puts students on a track of that could lead to giving up and good problem solver is very persistent

ChrisA: I have a personal definition of failure: I have not failed until I have given up

ChrisA: that leaves plenty of room for getting it wrong before getting it right

JulianneP: Good point!

ChrisA: I think that is hard to do in an academic classroom

ChrisA: it is taught to convince a kid who is not succeeding in a subject like Math that they have ability in Math

NatalieSc: and all this ties to emotional intelligence.... emotional intelligence gives you drive and the resiliency to keep going

KatarinaF: it takes a lot of time to come across a right answer through failure after failure.

ChrisA: that leads me to my next point

ChrisA: subjects should never be taught by themselves: a good problem solver is constantly transferring knowledge from one place to another

NatalieSc: you must make the kid successful (however small) and then build upon that success. This is when they will begin to build confidence

JulianneP: I think this is one of the most important points in problem-solving

JulianneP: no man is an island, and neither is a subject!

BJ: cool, Chris.

ChrisA: think about it we spend so much of our academic careers studying subjects isolated from the rest of the world to only find out in the end that no subject exists by itself in the "real world"

ChrisA: I am going to have to wrap this conversation up as I have a school board meeting awaiting me

JulianneP: but it can get easy to separate subjects and teach them in isolation--it takes good planning to mix it all together

ChrisA: I have enjoyed our conversation thank you for your time

JulianneP: it's how real life works, though--and how our minds work naturally

JulianneP: imagine designing curriculum around how we really function

BJ: Thanks, Chris!

MaryannA: Thanks

JulianneP: Thank you!

NatalieSc: thanks ..

BJ: PBC meets again on May 15