Frustrations from Technologies - Is It Worth It?

Igor V. Roshchin

Department of Physics and Astronomy
Texas A&M University

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Teaching with Technologies

- Popular
- Important
Why whine bother?

Main Entry: **frustration**

Pronunciation: (ə)frəs-'trā-shān

Function: noun

Date: circa 1555

1 : the act of **frustrating**

2 a : the state or an instance of being **frustrated** b : a deep chronic sense or state of insecurity and dissatisfaction arising from unresolved problems or unfulfilled needs

3 : something that **frustrates**

In Physics (esp. Nanoscience):

- **Knowledge of frustrations is important**
  - allows to learn the mechanism of the phenomenon
Who Are You?

Targeted audience:

– Colleagues:
  • get a balanced evaluation
  • learn workarounds
– Vendors: hear what we need and talk to us
– ITS: please, continue helping us – see how
– University policy-makers (including technical policies): learn from our problems and improve
Today’s Journey

- What’s good in technologies?
- What is not advertised?
- Costs (to you, your students, your university)
- Be prepared for …
- What to do if …?
- How can the vendors help?
- Who else can help you?
Tools/technologies

• Mastering Physics
• Vista Blackboard aka WebCT aka eLearning  
  – content  
  – gradebook
• CPS “clickers” from eInstruction
• Powerpoint (yes, it is still a technology!)
• Other (CPR, TurnItIn, …)
Why use technologies?

• Engages students
  – e.g. into discussion of the clicker problem
• Encourages student participation
  – Wakes them up
  – Immediate feedback (MP, WebCT, clickers)
• Makes it easy for the instructor/TA
  – Immediate feedback (MP, WebCT)
  – Communication/Feedback (eLearning)
  – No need to grade homeworks
• Enables certain learning activities
  – Weekly homework for large (100+) class
Why WebCT?

All tools implemented with WebCT, but in principle could have used other formats

• Quiz tools readily available
• Design once, reuse indefinitely/easily for all instructors
• Students can use anywhere
• Class rosters automatically added
• NetID login security
• TA’s can enter grades
• Great support from ITS!!!
WebCT and Problem solving

- Students are clearly getting better at the math
- More than 3,000 math quizzes for 120 students, or ~300 math problems/student

Courtesy of Dr. D. Toback
Mastering Physics

- MP Tutorials improve problem solving skills

Courtesy of Claire Masson, Mastering/Pearson
Mastering Chemistry

Courtesy of Claire Masson, Mastering/Pearson

- Improvements from when MC is not used
Number of students

Mastering (students per year)

- Astro 635
- Chemistry 772
- Biology 918
- Physics 2,939
- Total: 5,264

- Clickers 64 courses 8,400 Fall’09
  43 courses 5,000+ Spring’10

- eLearning over 40,000 per semester
Why use technologies?

• Engages students
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• Makes it easy for the instructor/TA
• Enables certain learning activities

NOT Automatic!

You must be enthusiastic!
What is not advertised?

• It takes:
  – Effort
  – Time

• What it costs to
  – students
  – you
  – university
The effort

• Most things are well designed and work well IF everything goes well
  – Fall 2008: started using Mastering Physics within less than 1 week (with templates for HW assignments)
  – Fall 2008: started using clickers within 1-2 weeks
  – Spring 2009: started using WebCT within 1 week (departmental support team)

• Need great people/preconfigured content.
  – Dr. James White in Physics
  – Jeff Kurtz (ITS) and Chris Mays (eInstruction)
  – Dr. Dave Toback and his Physics WebCT Team

• Do your own homework (in advance if you can)
  – Prepare the content
  – Think about course policies (!)
Policy Example: 100%

• For ALL quizzes: Passing requires a 100% score, within the allotted time

• If they fail:
  – Indicate the correct answers
  – Unlimited number of attempts (without penalty)
  – Change the problem (slightly) on each attempt

• Passing required to move on to next quiz

• Required to pass all quizzes to pass the course

Courtesy of Dr. D. Toback
Why 100%?

• Forcing “100% policy” combats the temptation to just do easy problems
• Multiple topics and difficulty level incorporated into each quiz
  – Encourages learning material as a whole
• Students motivated by getting 100% for part of their grade (?)

Note: Yes, this means that everyone gets a 100% for their homework grade. All this does is “shift the mean grade in the course.” (Students don’t understand this…). In practice: Giving harder exams (lower mean scores) and making the homework only worth about 15% of the grade.

Courtesy of Dr. D. Toback
Policy:
Another Example using WebCT

Force the student to have their equations ready to go!

Courtesy of Dr. D. Toback
It takes time!

• Time to prepare – That’s OK!
  – great investment
  – can share with colleagues
  – some help from publishers?

• Time in class
  – Students getting ready (policy)
  – Software is slow (CPS clickers)

• Time it takes when things go wrong
What can go wrong?

Anything!
What can go wrong?

Anything and Everything!
What can go wrong?

Anything and Everything! Fall 2009:

- Howdy – new system
  - Overloaded the first day
  - Ergonomics/usability problems
- Computers in the room – takes 5-10 minutes to load
- Clickers
  - Cannot register
  - Half – do not connect
  - “Out of the box” feature is turned off by the vendor
  - Database incompatibility between SW versions.
  - Roster “collisions”: two students with the same pad ID
  - Students unregistered by the system
  - Long tech-support hold time (50 min!) and response
  - Uploading grades to eLearning: empty score turns into 0
- eLearning
  - the columns do not keep the order
  - TA’s cannot download roster (but can upload and edit)
  - Issue with the End Of Line in CSV files
- Mastering Physics
  - Oversold – long hold time.
  - Wrong response from the support about class configuration.
  - Enrollment issues
  - Tech support does what he wasn’t asked to do.
  - Errors in the problems/solutions
What can go wrong?

Anything and Everything! Fall 2009:

• Howdy – new system
  – Overloaded the first day
  – Ergonomics/usability problems
• Computer takes 5+ minutes to load
• Clickers
  – Half – do not connect
  – Cannot register
  – “Out of the box” feature is turned off by the vendor
  – Database incompatibility between different SW versions.
  – Roster “collisions”: two students with the same pad ID
  – Students unregistered by the system (no notice sent!)
  – Long tech-support hold time (50 min!) and response
  – Uploading grades to eLearning: empty score turns into "0"
What can go wrong?

Anything and Everything! Fall 2009:

• eLearning
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• Mastering Physics
  – Oversold – long hold time.
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What should you do?
What should you do?

• **Don’t panic!** (© Douglas Adams)
• In class: make an attempt, but don’t waste too much time
• Outside of class: keep notes, copies, etc.
  – vendor/ITS support might not be able to reproduce
  – may not believe you
• ITS
• Vendor’s tech-support

“Saving a drowning person is in his own hands”
(sarcastic Russian proverb)
Vendor tech-support

“Someone calling themselves a customer says they want something called service.”
I can appreciate your frustration and I am truly sorry that you have had a difficult experience this semester. I can assure you that your success is important to eInstruction and we are working toward a resolution. Please bare with us as we seek a solution that will get help you enjoy the benefits of CPS without frustration.

Best Regards,

Chris Mays
eInstruction
When things go wrong...

• Analysis in class
• On the phone with support
• Tech support can be
  – un(der)-trained and/or
  – unmotivated
  – over-motivated
Time it takes
Non-Bloom’s Taxonomy

• Time lost in class:
  – failure of the system connection/communication
  – sluggishness of the software
  – figuring out what could be the problem for particular students.
  – total time lost: 5-8 minutes
  – total time lost in percentage to the class time (50 min):
    > 10-15%
Time it takes

• Time lost in class:
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• Time lost outside of class:
  – on the phone/e-mail chat with the untrained/unmotivated support
  – proving why support's suggestions are incorrect and useless
  – writing e-mails to support and others
  – waiting for response
Total Costs

• Costs of:
  – time wasted (both paid by the university and my personal time)
  – missed opportunities
  – lost confidence (by students)
  – hardware and registration for students (aka revenue for the company)
  – hardware(*) and installation for the university

• Total cost - prohibitively high

• Overall experience - priceless
  (not sponsored by MasterCard)
It costs

• eInstruction CPS “clickers” classroom:
  – $1975.00 (16)
  – $2965.00 (24)
  – $3955.00 (32)
• Single clicker: $25-35.
• Registration: $13 (one semester), capped at $39. Or $35 “lifetime”
• At “non-standardized institution” $15, capped $60.

• Mastering (includes e-book)
  – Included with the new book
  – “a la carte” $50 Physics, $30-50 other
    (“Price depends of length of access and amount of material”)
For a Student

• New Book vs. Used Book
For a Student

- Mastering Physics $50
- Clicker: $25
- Clicker registration $13

- Sub-total: $85 on top of the rest (tuition, fees, textbook, etc.)
### Number of students

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- **eLearning**
  - over 40,000 per semester²
Outcomes
(what’s in it for you?)

Upon my inquiries and activities:

• Mastering Physics:
  – Found and corrected many errors
  – I proposed the algorithm for an automated mechanism of detecting errors.
  – Improved (somewhat) security
  – Hopes for further improvements

• eLearning/WebCT:
  – Discovered incompatibility issues with older modules

• CPS clickers:
  – Proposed solutions for integration that will allow troubleshooting without FERPA violations
Improvements?

• Mastering Physics:
  – Implement proper security standards (SSL-enabled)
  – Pass-through registration integrated with eLearning
  – Integration with eLearning gradebook
  – Implement the algorithm for an automated mechanism of detecting errors
  – Train customer support personnel
  – Improve response time:
    • Customer support
    • “Back-office” – content team.
Improvements?

• eLearning/WebCT:
  – Improve speed and browser compatibility
  – Find a mechanism for debugging issues (A&M policy and relation with the vendor)
  – Solve EOL issue with CSV

• eInstruction (CPS clickers):
  – Improve customer service response (attitude and time)
  – Make the software FASTER and less of a resource hog
  – Try to keep compatibility between versions
  – OOTB feature – make that instructor-configurable option
  – Do not convert empty score into “0” upon uploading to eLearning

• ITS/TAMU
  – Stop using UIN as a gradebook identifier
To use or not to use?

• It’s YOUR decision
• Caveat Emptor (lat.: "Let the buyer beware“)
  – Benefits
  – Time and energy costs
  – Frustrations
  – Make sure you have/build a support team
  – Always have a “plan B”.

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