Why Disruptive Innovation is Mostly Happening Outside Traditional Education (and how education systems might adapt)

Tim Pearson
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Tim Pearson

- RM plc – 1981 to 2008 (CEO for almost 7 years)
- Internet Service to UK schools 1996
- Consultant to UK Technology Strategy Board 2009
- Have advised a number of UK software companies
- Currently Chairman of Updata Infrastructure and board member of several other technology companies
- Not representing anyone today!
My First Computer

Built summer 1981

256 byte memory!
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A commercial view

To help policy makers and teachers understand why we are where we are…

**Not to** – lobby on behalf of industry
What do we mean by disruption

- How large companies fail
- Focus on addressing current consumers
- Hard to structure for smaller markets
- Entrants with *worse* products and new technology but lower costs
- Aim for non-consumers
- Market grows and product improves
### Some Industry Changes 1980 - 2012

<table>
<thead>
<tr>
<th>Industry</th>
<th>1980</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airline</td>
<td>National Carriers Full Service</td>
<td>Low Cost Point to Point</td>
</tr>
<tr>
<td>Publishing</td>
<td>Paper via Bookshops</td>
<td>Increasingly e-book via online merchants</td>
</tr>
<tr>
<td>Music</td>
<td>Still vinyl records sold in record (CD being prepared for launch in 1983)</td>
<td>digital online</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>National, manual, blueprints</td>
<td>Global, automated, CAD &amp; CNC</td>
</tr>
<tr>
<td>Computing</td>
<td>Mini-computers &amp; Mainframes</td>
<td>Smartphones</td>
</tr>
</tbody>
</table>
Disruption in Education?

How much disruption have we seen in education, and in particular in state education systems?
IT has found uses in schools

- Student research
- Special needs help and education
- More exciting forms of tuition
- Technology education itself

...but these are all incremental not transformational applications
An example
We do know...

But the data says that overwhelmingly teachers use technology predominantly for lesson preparation and NOT within lessons or for communicating with pupils or parents.
Why are schools (largely) unchanged

• Teacher Regulation
• School Regulation
• Examination and Curriculum regulation
• We rely on schools for daytime childcare!
• No “Non-consumers”

These aren’t going to change anytime soon!
…and probably shouldn’t…
Why is usage of technology low

- Departmental & teacher switching costs
- Text book is the lowest common denominator
- Exam system and curriculum coverage
- Technology setup hassle and class management
- Showing educational gain is very hard, expensive and requires a very long term business model
Could BYOD Help?

- Less teacher technology hassle
- Devices always with students might enable new models?
BYOD in schools is not easy

- Reaching the last 5% of kids is hard - it must be 100%
- Technology hassle – batteries/charging/versions
- Device potential for distraction – e.g. text messages

Idea - what about a specification for device communications control if in school?
Educational technology is a tough business

- Few real success stories
- Many attempts
- Few really big (commercial) investments

- Two sales models
  - Regional / national sales
  - Individual school sales
Selling Technology to Schools is Hard...

- Regional Sales
  - Long sales cycle
  - Lots of requirements in curriculum and pedagogy
  - Schools and teachers often have no idea that the product is available so it doesn’t get used
  - Often unlikely the purchase is repeated at regional national level so no sustainable business model
Selling technology to schools is Hard...

- Individual school sales
  - Long sales cycle
  - Departmental agreement often needed
  - A lot of sales effort for a very low value
  - Departmental budgets often tiny
  - Need agreement from both department and school IT people
It is expensive to produce

• High media requirements (expensive)
  – lots of pictures / sound / interactivity

• Localisation incredibly high barrier
  – Teachers (rightly) reject anything that doesn’t have local currency, measures, spelling, voices, cultural images
  – To localise a product to a particular market can easily cost 50% of the origination cost
### Example P & L stack

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenue</td>
<td>€ 1,000,000</td>
</tr>
<tr>
<td>Costs of Supply (servers, support etc)</td>
<td>€ 150,000</td>
</tr>
<tr>
<td>Sales and Marketing</td>
<td>€ 400,000</td>
</tr>
<tr>
<td>Other Overhead</td>
<td>€ 300,000</td>
</tr>
<tr>
<td>Product Development</td>
<td>€ 150,000</td>
</tr>
<tr>
<td>Profit</td>
<td>€ 0</td>
</tr>
</tbody>
</table>
Sorting the good from the bad?

- This market dynamic can mean that poor products with good sales and marketing can last too long.
What products do work?

- **School Management Software**
  - Often Mandated and very high switching cost

- **Whiteboards**
  - Proprietary software lock in (why is that accepted?)

- **VLEs (in some institutions but not others)**
  - High switching costs

....All rely on lock in of one form or another
Digital Text Books

- Apple, RM and others bringing in new products
- Although incremental change it may put in place systems and behaviours that allow a larger shift.
Disruption Outside of School Education

There are examples of disruption outside of mainstream school education systems.
Example 1

Question – Who is (probably) the highest paid teacher in the world – and how much do they earn?
South Korean Web Tutors

Rose Lee (English teacher)

Woo-Hyeong-cheol (Maths teacher)

New York Times reports they earn more than $10m per year between them
Disruption

✓ Start with a “worse” product
✓ Lower cost
✓ Attract non-consumers
✓ High Volume
✓ Grow brand and improve product
✓ Threaten established providers
Example 2

- Hibernia College Dublin
  - Unfunded private sector teaching qualification
  - Competes against funded state sector
  - Now the largest provider of primary level teachers in Eire
  - (almost) all academic study done online
  - Attracting a different demographic
  - Developed a strong brand
Hibernia - Disruption

- Attracting non-consumers
- Lower cost model
- Not something incumbent providers would have done
- Higher volume has resulted
- Product improves
- Overtakes traditional suppliers
Example 3 MOOCs

- Udacity 150k on Introduction to AI course
- Coursera 1.7m sign ups
- edX 370k initial registrations
- Udemy
- (Kahn Academy) 6 million students a month viewing
- (iTunesU)

MOOC = Massively open online course
@interface CalculatorBrain
@property (nonatomic, strong) NSMutableArray *operandStack;
@end

@implementation CalculatorBrain
@synthesize operandStack = _operandStack;
-(NSMutableArray *)operandStack
{
    return _operandStack;
}
-(void)setOperandStack:(NSMutableArray *)operandStack
{
    _operandStack = operandStack;
}
-(void)pushOperand:(double)operand
{
    [self.operandStack addObject:[NSNumber numberWithDouble:operand]];
}
-(double)performOperation:(NSString *)operation
{
    double result = 0;
    // calculate result
    return result;
}
@end

// CalculatorBrain.h
// Calculator

// Created by CS193p Instructor on 9/29/11.
// Copyright (c) 2011 Stanford University. All rights reserved.

#import <Foundation/Foundation.h>

@interface CalculatorBrain : NSObject
@end

-(void)pushOperand:(double)operand;
Criticisms of MOOCs

• Drop out rate
• Candidate authentication
• Accreditation
• Lack of Teacher interaction

BUT…
Very disruptive

✓ Lower cost
✓ In some ways worse
✓ (much) Higher volume
✓ “Non-consumers” are much of the market
✓ Some / Many will fail but some will succeed and build big brands valuable in their own right

Tertiary education will be affected
Why should I care?

• Why shouldn’t (your) school students take these courses?
• What could be more personalised than students deciding to take the course that suits them best!
• Also in a many-one model?
Summary

• Disruption not happening or going to happen in the schools market
• Disruption is going to happen in all/most other education markets
• Incremental adoption of technology in schools requires attention to practicalities.
• It's hard to build a successful business designing and selling ed tech to schools
Advice to Policy Makers and Schools

1. Digital textbooks may be a useful bridge so adopt them
2. Open source textbooks may also be a useful bridge so encourage them (without killing your publishers!)
3. Expect online courses to gain brand and status
4. There is no reason why online courses can’t be encouraged or even time allowed for them in schools
5. Open courses can be useful additional or alternative teaching materials (many to one)
6. Purchase technology in a way that fosters a long term industry
7. Concentrate more on (lowering) market barriers rather than any subsidy or fund
8. Improve education of technology as a priority – its an easy target
9. Expect higher and adult education to be disrupted
Credits

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