“It was just related to everything ...”
Perceptions of teachers and students of innovation education in Icelandic compulsory schools

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Ph.D. research of innovation education

- Ongoing Ph.D. research on innovation education in Icelandic compulsory schools.
- Understanding of teachers and students of innovation education explored and analysed.
Why do this research?
Innovation discourse

- Innovation - an important trait in modern society
- Often heard in official discourse
- Innovation education defined as a compulsory school subject in Iceland in the 1999 national curriculum
What is innovation education?

Innovation education is about:

- Enhancing and improving the conditions of social life through inventing/creating new objects or redesigning those that already exist
- Students
  - search for needs that are important to them
  - solve needs or problems
  - find solutions that can become
    - personal solutions, new designs, technological innovations or social innovations and business ideas.
- Innovation education (IE) is a school subject somewhat similar to Design and technology education or CDT.
Innovation education – the practical use of knowledge

Innovation – the Icelandic word “nýsköpun” means literally “new-creation”

- Innovation education was introduced within the curriculum for compulsory schools in Iceland in 1999
  - In the Information and technology curriculum
  - A chapter called *Innovation and the practical use of knowledge*
  - As interdisciplinary: as a special task or a method to transform other subjects
  - No special time allocation

- Innovation education calls for flexible organization, giving value to student voice, eliciting the tacit knowledge of students and situated learning.

- My own research in 2003-2004 showed little dissemination of innovation education in Icelandic schools and many factors influencing its development.
Data

- Most of the data was gathered by mixed methods though mainly by qualitative traditions.
  - Interviews with:
    - 11 innovation education teachers from eight schools
    - 4 focus group of students in four different schools
  - Classroom observations in schools.
  - Analysis of written documents in the policy areas of science, technology, innovation and science
- Some of the data was collected through a larger research on science and technology education (*Intentions and Reality*) in Icelandic compulsory schools
  - Classroom observations – questionnaires – interviews
Theoretical tools 1

- Bernstein’s theories on pedagogical code
  - To consider the discourses of innovation, science and technology and discourses of education
  - The classification and framing of innovation education

- Activity theory (not reported here)
  - Used to help to form an understanding of the messages extracted in the research - to locate contradictions and tensions in order to locate opportunities and suggest steps to move forward.
Theoretical tools 2

- Bronfenbrenner’s theories on the ecology of human development
  - To detect influences of contexts local and remote
- The ideas of Rogan and Grayson on the Zone of Feasible Innovation
  - Used to detect the level of school and teacher development and readiness (or otherwise) to work with innovation education.
Bronfenbrenner (1979)

**Personal level:** The individual is the foundation for the development.

The individual interacts with others within the *microsystem*. A microsystem is a pattern of activities, roles, and interpersonal relations experienced by the person in a given setting with particular physical and material characteristics.

A *mesosystem* comprises the interrelation among two or more settings, a system of microsystem.

The third level of the ecological environment, the *exosystem*, refers to one or more settings that do not involve the person as an active participant but in which events occur that affect what happens in the setting containing the person.

Within each society or subculture there exists a kind of a blueprint for the organization of every setting. Such generalized patterns are referred to as *macrosystems.*
Zone of feasible innovation
Rogan og Grayson (2003), Rogan (2006)

Rogan and Grayson (2003):
- Progress in school development does not happen in one gigantic leap – it takes place in steps as these are changes in culture
- Innovation is most likely to take place when it proceeds just ahead of existing practice.
- The capacity to support innovation needs to be developed concurrently with efforts to implement innovations
- As the capacity to support innovation increases it is likely that a larger range of profiles of implementation will be possible

- Rogan (2006) discussed the idea of the Zone of Feasible Innovation – ZFI in the development of educational innovations
Analysis of implementation

• Analysis of implementation
  – Rogan and Grayson – a profile of feasible steps in the development of innovations
    • Progression from foundational level (level 1) to ideal level (level 4)
  – Describe levels of development for each ecological system (from Bronfenbrenner)
    • Personal, micro, meso, exo, macro system
    • Each system includes feasible steps in the development towards the ideal levels
Mapping implementation: ZFD and Bronfenbrenner

- Innovation education – six teachers, three schools
- Country Fjord City

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Analysis of three schools with Bronfenbrenners and Rogan og Graysons theories (see photocopies)

- The analysis revealed the location of the different teachers and their schools in their development towards feasible implementation of innovation education.
- Personally, three of four City school teachers were partly at level 3 whereas one of them and the teachers of Country and Fjord were at level 2.
- Teachers have reached similar levels of development within the micro and meso systems though City school is at level 3 the others at level 2.
- The macro system is considered to be at level 2 as official policy supports and the official curriculum prescribes innovation education.
- The least developed system is the mesosystem containing the views of the society, among them parents, support and working conditions such as the teacher union contract – why is this so?
Bernstein’s tools to detect the internal rules of the pedagogic device

- **Regulative discourse (RD)**
  - *This is who we are – traditions in a subject or school – this is what we emphasize – these are the kind of students we want – the culture of a subject or a school*

- **Instructional discourse (ID)**
  - *These are the kind of skills and knowledge our students should acquire – that is the way we arrange teaching to get this knowledge and skills across – in this order/sequence and this is how we evaluate the knowledge and skills.*

- **RD is the dominant discourse** and produces *the order* in the ID
Bernstein’s concepts

Power relations are defined by the concept *classification*. This can be seen in the structure of the timetable, arrangement and use of spaces and importance of subjects. The teacher is often the authority figure in the classroom and has the greatest amount of power within that setting – clear distinction between student and teacher.

• **Classification** – strong or weak
  – defines the construction of a social space (i.e. school subjects)

• **Framing** – strong or weak
  – Who controls: the selection of communication, sequencing, pacing, the criteria and control over the social space.

Framing is strong when the teacher has explicit control e.g. the pedagogic practice is visible, weak framing gives the student more control and tend to have invisible pedagogic practice.
Classification – boys and girls

Steward Street, Birmingham, 1947.
Who has power?
Analysis of data from 11 innovation education teachers using the concepts of classification and framing

• Rúna, Bryndís, and Anna in City School
• Heidi in City School
• Sunny in Country School
• Paul in Hill Scholl (Reykjavík)
• Sedna in High Hill School (Outer Reykjavík)
• Hanna in Fjord School
• Kiera in Peak School
• Sigurdur í Town School
• Gunnar in Sandhill School (Reykjavík)

Attitudes towards and presentation of innovation education

Different RD – local discourses that promote different ID (ID also a personal choice)
Findings

• Innovation education – in most cases unclear or unknown
• IE is most easily understood and practised as a special subject
• Teachers: personal and professional values impact their ability to create a constructive learning environment. Some have a good hold of the weak framing of IE, others choose strong framing that limits students choice and independence (chaos angst?)
• Where boundaries are easily crossed (of subjects, time and roles) – if the division of labor is shared IE comes naturally, it fits the culture.
• Clear division of labor is the norm or sought after (strong classification)
Student attitudes

• Most see innovation education a special subject
  – one of the groups had no knowledge of the subject or was familiar with the main concepts
  – “it is a subject that incorporates many subjects”. Mainly positive attitudes (long for more choice and manual work).

• ”... it was just related to everything”
“... it was just related to everything. “

I was once in a school in East-Iceland and had innovation education classes. We were creating ideas and making them for real and it was a lot of fun. I think innovation education is an arts and materials subject - and it was just related to everything. It was related to technology, science, math's, arts and woodwork, just all in one.”

(A citation to a 10th grade student in a school in the capital of Iceland)
Discussion

• Contradictions in the wants of teachers and the needs of innovation education:
  – Need for classified subjects and boundaries (clear rules for division of labor)
  – IE needs flexibility of boundaries of subjects (and time)
• What is the solution?
  – In those cases (Kiera) where boundaries were not limiting creative work (IE) the solution was found (or boundaries were no problem)
  – But – the system is rigid and classified – (RD of a strong classification and framing), how can the others deal with the claim for IE?
    • Is it a need that is important to fulfill?
    • If yes – can we change the system or the perception of the need for IE?