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

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This paper

- Reports an ongoing Ph.D. research on innovation education in Icelandic compulsory schools.
- Understanding of teachers and students of innovation education explored and analyzed.
Innovation discourse

- Innovation - an important trait in modern society
- Often heard in official discourse
- Innovation education a compulsory school subject in Iceland since 1999
What is innovation education?

Innovation education (IE) is a school subject similar to Design and technology education.

Innovation education is about:

- Inventing new objects, redesigning things that already exist to enhance and improve the conditions of social life
- 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 – 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.

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

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.

• Written documents in the policy areas of science, technology, innovation and science were consulted.

• Part of the data was collected through a larger research on science curriculum and innovation education (Intentions and Reality) in Icelandic compulsory schools
  • Classroom observations – questionnaires – interviews
Theoretical tools

• Bernstein’s theories on pedagogical code
  – To reveal and explain influences beneath the discourses that emerged

• Bronfenbrenner’s theories on the ecology of human development
  – To detect influences of local contexts close and remote

• The ideas of Rogan and Grayson on the Zone of Feasible Innovation
  – Used to detect the level of school and teacher development in innovation education.

• Activity theory
  – Used to help to form an understanding of the messages extracted and to suggest steps to move forward.
Zone of feasible innovation
Rogan og Grayson

Rogan (2006) introduced the idea of the Zone of Feasible Innovation – ZFI in the development of educational innovations

Rogan og Grayson (2003):
• Progress in school development does not happen in one gigant leap – they take 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 bigger range of profiles of implementation will be possible
Theory of implementation

- Rogan and Grayson – a profile of feasible steps in the development of innovations
- Progression from foundational level to ideal level
- Describe levels of development for each ecological system (from Bronfenbrenner)
- Each system can be characterized by theme emphasis
**Personal level:** The individual is the foundation for the development. A variety of individual or personal attribute factors will likely affect the development of an innovation education teacher.

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. Within an educational context, the microsystem of a teacher is likely to be the family members, students within classrooms, and close colleagues within school.

A **mesosystem** comprises the interrelation among two or more settings, a system of microsystem. Mesosystem factors in this research could be: priorities in the school curriculum; physical arrangement of lessons; connections between subjects; school receptiveness to learning and change; school timetabling decisions; evaluation procedures at school level.

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. These can be parent and community aspirations towards subjects. Demands of the modern society, working outside the home, attending to own children affect these aspirations and the efficacy of the teacher to fulfill her professional role.

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.** Here the macrosystem factors include government curriculum policy decisions; national curriculum development priorities; professional development agendas at national level; national external evaluation procedures and pay scale structures.
Locating ZFD

- Innovation education – 6 teachers, 3 schools
- Country, Fjord, City - Iceland
Analysis of three schools with Bronfenbrenners and Rogan og Graysons theories (see photocopies)

- The analysis revealed the location of the different teachers in their development towards the feasible approaches in innovation education.
- Personal column shows that three of four of City schools teachers were partly at level three whereas one of them and the teachers of Country and Fjord were at level two.
- Column two shows the developmental stage of the microsystem, then the mesosystem, exosystem and finally the macrosystem.
- Similar stages of meso and exosystems though City school at level three the others one below.
- The macro system is considered at level two as official policy is supporting and the official curriculum contains 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.
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 relation is defined by the word *classification* that within a school can be seen in the structure of the timetable, arrangement and use of spaces and importance of subjects. The teacher is usually the authority figure in the classroom and is allocated the greatest amount of power within that setting – clear distinction between student-teacher

• **Classification** – strong or weak
  – define 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 the power?

analysis of data from 11 innovation education teachers using 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 and presentation of innovation education

Different RD – local discourses that promote different ID (ID also a personal choice)
Activity theory
Activity system
– typical schoolwork/innovation education

**Tools**
Theories on teaching and learning activities – study materials/curricula – evaluation methods

**Teachers**
used to be at the steering wheel in the classroom, used to dealing with finite knowledge

**Rules**
- School curricula – teacher controls in the classroom
- Time table – national curriculum
- Teachers contracts – School houses

**Community**
a community of professionals in the workplace
- a community of the classroom
- a community of the local school area

**Intended outcome**:
Independent students – strong individuals - know how to find relevant information – learn by creating. Capable of solving problems in their own lives and develop ideas into products or services.

**Object**:
Innovation education – creative thinking – a capacity to think about the world and deal with it in a creative way
The capacity to innovate a part of every individual. IE as a foundational training and available tool in every subject.

**Division of labor**
- teacher as a subject specialist – leader of other colleges in development
- Specialist support – role of advisors
- role of parents – role of students

Main findings
innovation education in Icelandic schools

**Tools**
Constructive approaches – constructive freedom – balance between freedom and chaos, a balance between structure and freedom

**Outcome**
According to students: a special subject. Mainly positive attitudes.
We were creating and making things – it was just related to everything

**Subject, teacher** - 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

**Rules** - The official curriculum is not seen as restricting and flexibility is implemented in the schoolwork – flexibility in the time table – cooperation. Schoolhouse arrangement flexible.
Vs. teacher set own rules for this area and find lack of respect for manual subjects reflected in the curriculum and salaries restricting.
Specified location

**Object**: Innovation education
- unclear or unknown
- Most easily understood and practiced as a special subject
- creative thinking – acquiring skills to think about and deal with the world in a creative manner. The whole world and the local environment is a well of study materials and opportunities.

**Division of labor** – Where boundaries are easily crossed (of subjects, time and roles) – the division of labor is shared IE comes natural. (fits the culture).
Clear division of labor is the norm or sought after (strong classification).

**Community**: clear common aims with an emphasis on creativity and integration – connection with local community vs. The IE specialist seeks community for IE work mainly outside (other specialists) isolates IE within the school
“... 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 10.th 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?