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Published in:
American biology teacher

DOI:
[10.2307/4450363](https://doi.org/10.2307/4450363)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
1997

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Jansen, BJ., Dijkstra, M. J., & Bloem, A. (1997). A new curriculum for ethology & student skills in the Netherlands: Part 2: Innovation & implementation activities. *American biology teacher*, 59(8), 488-490. <https://doi.org/10.2307/4450363>

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UNIVERSITY OF CALIFORNIA PRESS
Advancing Knowledge, Driving Change

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Source: *The American Biology Teacher*, Vol. 59, No. 8 (Oct., 1997), pp. 488-490

Published by: University of California Press on behalf of the National Association of Biology Teachers

Stable URL: <http://www.jstor.org/stable/4450363>

Accessed: 14-06-2018 14:24 UTC

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A New Curriculum for Ethology & Student Skills in The Netherlands

Part 2: Innovation & Implementation Activities

Bram J. Jansen Maurits J. Dijkstra Alex Bloem

IN the Netherlands, a new National Curriculum for Secondary Education in Biology was implemented in 1993/1994. Ethology (Behavioral Biology) was a new part of it. Another innovation concerns the introduction, on a compulsory basis, of such student skills as research, information processing, formulating opinions on social/biological issues, and orientation about biological professions.

Our department has been involved in the development and implementation of these two innovations. Our work has been structured by the "action research" methodology in which the teachers' practice plays a dominant role. (Contrary to the American situation, action research is rather unknown in The Netherlands.) Furthermore, we are involved in a "bottom-up" strategy for the implementation of the innovations.

In Part I (*ABT*, September 1997) we reported about the new biology curriculum in The Netherlands; the ethology content in the curriculum; different didactic aspects of our lessons on ethology education; and the student skills that are part of the new curriculum and their place in our lessons. In this article we discuss our action research activities for the new curriculum; the roles played by biology teachers; the role of our teacher education center; and the bottom-up implementation strategy.

Innovation Activities

In 1988, the WEB committee delivered proposals for the VWO [Voorbereidend Wetenschappelijk Onderwijs] and HAVO [Hoger Algemeen Onderwijs] examination programs. Then in 1989 three teacher training centers (at the universities of Groningen, Utrecht and Amsterdam) started a national innovation project, called PBB (Project Upper Grades Biology). Its purpose is threefold:

1. To write a complete new curriculum on biology for the upper grades

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2. To develop and try out new lessons for parts of the curriculum
3. To prepare in-service teacher education concerning the new curriculum.

Its implementation on a nationwide scale started for VWO in summer 1991; for HAVO it started in summer 1993.

We have been participants in the developmental project work for the HAVO and VWO levels. There are four teams for the developmental work: one on homeostasis, one on plant nutrition and plant ecology, one on human genetics and health care, and—our area—ethology and student skills.

Results up to now of our project on ethology and student skills, besides the two series of lessons (see *ABT*, September 1997, pp. 404-410), are:

- A booklet on content and methods of ethology education, according to the general objectives of the WEB report
- Several documents (for teachers' use) on 'bottom-up' curriculum development and implementation
- 'Immaterial' products such as:
 - Expertise on 'integrated biology' (that is, biological education in which subject matter, student skills and social settings all have a place in a balanced curriculum)
 - Expertise on networking for the sake of curriculum development.

We have presented the knowledge and expertise we have gained on various occasions, at Dutch teacher conferences, in Dutch teacher journals, and at conferences for teacher education.

Within the national project (PBB), our team is the only one that works with the action research strategy for innovation and with the network strategy for implementation. We took this in 1982 from German educational practice in the 70s. We elaborated on it for the purpose of our own innovative work with teachers. Since 1983 we have been in contact with the International Classroom Action Research Network (now called the International Collaborative Action Research Network. It delivers the new journal, *Educational Action Research*, an international journal published by Wallingford, G.B.). This group has its origin in Great Britain [present address: Bridget Somekh, CARN-coordinator, School of Education, University of East

Anglia, NR4 7TJ, Norwich; phone 0603 56161 ext. 2864]. We took part in several CARN conferences and delivered methodological reports on our action research work.

The reason we favor cooperation with teachers in any case of educational innovation is derived from considerations on two levels: the scientific and the political.

Research on curriculum development and innovation all over the world has demonstrated that no one innovation results in success unless the teachers' behavior, capacities, attitudes, and so on are taken into account. All research reports on these matters—most of them concerning the unsuccessful ending of top-down strategies—indicate that teachers should be given, to a greater extent and much earlier, a dominant role in innovative activities.

As to the political level, most educational systems have acquired over centuries many conservative and authoritarian characteristics (e.g. school organizations, methods, textbooks, examination terms, etc.). We think that educational innovation should allow room for individual thinking, individual values, and individual decisions, not only for the students but for their teachers as well. Educational innovation should be in the first place emancipatory—for students and teachers.

The Action Research Strategy: What Teachers Did!

As stated in the introduction, teachers played a very important role in the development of these lessons. They have been participants in a small network composed as follows (see Table 1):

The pioneer teachers and the support teachers were—with one exception—from the three northern provinces of The Netherlands. The TEC is a part of the University of Groningen, in the northern province of Groningen. The 13 follow-up teachers, from all over the country, responded to a call in the Dutch journal for biology teachers (*Bulletin voor Docenten in de Biologie*).

The members of every category on the list have had their own roles (see Table 1), but the key roles were those executed by the two pioneer teachers in cooperation with the staff members of the TEC. Their roles in action research are the foundation of the whole process. They started the preparation of new biology

lessons from two points of view: first they executed—very thoroughly—an analysis of their present situation, their ideals, their skills and other possibilities, etc. (their personal framework); and they studied, discussed and came to their personal conclusions about the WEB framework. Thereafter they started the construction of a new series of lessons. During teaching they were recorded (on audio and/or video) for the purpose of a thorough evaluation afterwards. Besides this, the pioneer teacher played a greater role in the process of cooperation with teachers, TEC staff, students, the biologist, and in the managing of the research process.

The support teachers participated in discussions. Sometimes they made their own trials of the new lessons of the pioneer teachers, and some of them made their own innovations in ethology education. Their presence in the network has proven to be of great help to the pioneer teachers because of their attending interest and support.

The follow-up teachers gave their feedback from a greater distance. They read the materials, worked with them if possible, and sent the network their discussion statements (see below).

As a means for structuring this process we used the Practical Action Research Planner, developed by the TEC. This Planner is the result of the analysis of seven action research projects of biology teachers and our TEC. It consists of eight steps and one general point, see Table 2.

Each of the nine parts of the Planner consists of several points of interest. Details can be found in Jansen, Koekkoek & Mallekoote (1991).

This Planner is NOT meant as some sort of 'recipe book' that has to be followed from the first page to the last. One of the essential characteristics of action research is that decisions and experiences in daily educational practice—and highly personal views as well—define the process of innovating education. Changing options halfway might be more important than sticking to the decisions made in the beginning of the process. Action research is not directed to new educational knowledge (of educationalists), but to "better judgments" (of teachers), as once said by John Elliott, the founder of CARN.

Table 1. Participants in the PBB network on 'ethology and student skills'.

- 2 pioneer teachers (every year)
- 5 support teachers
- 2 staff members from the Teacher Education Centre
- 1 professional ethologist
- some biology students
- 13 follow-up teachers across the country

Table 2. The Practical Action Research Planner.

- *Point 1-Request from a teacher
- *Point 2-Orientation
- *Point 3-Analysis
- *Point 4-Research design
- *Point 5-Research devices
- *Point 6-Research cycle(s)
- *Point 7-Evaluation
- *Point 8-Transfer
- *Communication

The Action Research Strategy: What the Teacher Education Center Did!

The roles of the TEC staff members have been twofold: On the one hand (e.g. with regard to the analysis of the actual situation of the teachers' practice, ideas, etc.) the TEC staff members played a supporting and clarifying role. With regard to the production of new lessons their role has been limited to a stimulating, and sometimes a structuring or simply a helping one; and in the evaluation of the lessons their role again has been one of structuring, clarifying, stimulating, etc.

On the other hand the TEC staff members played all sorts of supporting roles; e.g. they led the network, enhanced and stimulated discussions, prepared the transfer of results of individual teachers (see below), etc.

[We presented our experiences with this strategy for curriculum development in biology at the 1991 Classroom Action Research Network Conference in Nottingham, Great Britain.]

The Bottom-Up Implementation Strategy: From One Network . . . All Over the Country?

The last topic we present here is the dissemination of the new materials on ethology. In what way can biology teachers all over the country become acquainted with the innovations in the ethology curriculum in general, and in the lessons on Traffic and on Communication in particular?

What we have been asked to do, what we have done, and we have yet to do, are listed in the following eight items (some of them are on our own initiative, others are part of the nationwide implementation strategy of the new national curriculum on biology):

1. We have applied all serious comments received from the network members to both series of lessons; this series we have called the 'standard type' of lessons.
2. We have added to both series three so-called 'didactic variations': short descriptions of alternative pathways for executing the main objectives and goals in the lessons; e.g. in the Traffic lessons, variations include more structuring of the students' research by the teacher; in the Communication lessons they place more emphasis on subject matter, social development, or professional application.
3. We have added 'manuals' for the teacher.
4. We have written a full description of the ethological subject matter as a part of the national curriculum on biology.
5. We have published in Dutch professional journals very detailed articles on both series of les-

sons; and we have presented our work at several conferences on biology education.

6. Both series of lessons (including the 'variations' and 'manuals') have been published as two parts of the series of curriculum materials for biological education; and are for sale all over the country.
7. Our ideas and experiences regarding the innovative aspects of the lessons have been discussed in the national curriculum group; they are taken into account in the final texts of the national curriculum on biology.
8. In 1992 a country-wide, two-year-long scheme of in-service education started; our materials are being used, along with those of the other development teams, as a model for this new type of biology education.

Conclusion

It appears that it is possible to work along the action research strategy for curriculum innovation in a country (The Netherlands) in which all headlines of curricula are usually formulated by the ministry of education or national councils. There is fertile soil for such a bottom-up strategy because many teachers in our country are willing to change their educational practice—with or without the help of colleagues or outside facilitators.

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