Chapter 2

Curriculum implementation – limiting and facilitating factors.

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This paper discusses some aspects of curriculum implementation in order to provide categories and perspectives for building up or refining a strategy of implementing a curriculum. First, I shall discuss and define the concepts employed. Secondly, I shall contrast two different strategies of dealing with the implementation problem. Thirdly, I shall summarize main research findings about critical factors for implementation. Fourthly, I shall point to process characteristics of successful implementations.

1. Conceptual matters

General curriculum research is nowadays in German speaking countries a fringe activity. After a boom in interest in the 1970s to which IPN has made trend-setting contributions (e.g. Hameyer et al., 1983) we see very little recent publication activity in general curriculum research. Consequently, there is also very little specific investigation of curriculum implementation activities. It seems that the study of the processes of curriculum implementation has virtually dissolved to become one element of the more general field of innovation research and theory. And it surfaces from time to time when researchers venture to become practical with their innovative concepts, such as constructivist learning environments (Reinmann-Rothmeier and Mandl, 1999) or quality evaluation in schools (Altrichter et al., 1998), and find out that there are many obstacles placed on the path from concept to reality under practical circumstances.

Let me start with some conceptual clarifications. I understand innovation to be a social activity which aims at changes in four dimensions: social practices, the beliefs and understandings underpinning these social practices, its material aspects (e.g. artifacts used in these practices, materials, instruments, layout of space etc.), and the social and organizational structures in which these practices are embedded and which themselves are associated with systems of resources, power and sanction/gratification (see Altrichter and Salzgeber, 2000).

An innovation is usually characterized through some materialized plan which describes the intended practices, and the aspired ways of changing them, and argues the theories which justify the rationale. It uses some material, other resources (time, money) and specific social structures (e.g. steering groups, peer observation, debriefing sessions, regular appraisal) to make people act in another way. Its real test lies in being put into practice. Thus, innovation is a practice to change practices (Fullan and Stiegelbauer, 1991, p. 9).

2 The only recent book on general curriculum matters is a collection of international papers most of which one would count as examples of curriculum theorizing (Hopmann/Riquarts 1995). For the US, Goodlad (1994) claims that there is quite an amount of curriculum related papers at AERA-conferences, but little influence of academic curriculum specialists on the nation’s big curriculum projects: “When one examines the world of curriculum practice, it appears that ‘specialists’ are either mute or, at best, engineers following the blue prints of others.” (op. cit., 1265)
Consequently, a new curriculum may be described as an attempt to change teaching and learning practices which will also include the transformation of some of the beliefs and understandings hitherto existent in the setting to be changed. It is usually strong on the material side by providing a written curriculum, text books, recommendations for teaching strategies, working material for students, and probably also new artifacts for learning (e.g. in science education or in Montessori classrooms). It is usually less explicit on the organizational side but may also advocate the use of changed time tabling and new social structures, such as peer group interaction, decision making in the subject group, etc.

To distinguish these dimensions of innovation has two purposes: firstly, it describes innovation as a multidimensional phenomenon, and thereby, offers some categories for analysis and construction. Secondly, it draws attention to the empirical finding that concentration on some dimensions and neglect of other ones usually leads to deficient results (Fullan 1983, p.490). There are scores of examples of curriculum reform which concentrated on the material side and the theoretical justification of their approach and assumed that changes in teaching practice and in the beliefs and understandings of practitioners would follow from their material input - which frequently turned out to be incorrect. In summary, those innovations are expected to be more successful which explicitly stimulate development on all four dimensions and do not assume that changes in one dimension will automatically follow from changes on other dimensions.

Let me turn to the term implementation. Its history begins with becoming aware that it does not take place. It is not unfair to say that usually most of the attention and energy of early curriculum developers was focussed on the production side of their enterprise, on the materialized "plan" or "product". The idea was: If the product is good and if it is widely enough disseminated, it will be adopted by the realm of practice. However, history showed that many – some say: most (e.g. Fullan and Pomfret, 1977) – curriculum projects of the 60s and 70s have not been put into practice in a way curriculum developers had hoped. And that practitioners were not even always aware that they violated the developers' intentions (e.g. Reinmann-Rothmeier and Mandl, 1999, p.297). For innovating classroom practice, attention must obviously not only be given to the production phase of a curriculum, but also to what happens after the production. What processes happen under what circumstances if practitioners are supposed to "adopt" a curriculum?

Fig. 1: A simplified overview of the change process (Fullan and Stiegelbauer, 1991)

Thus, the term implementation in a broad sense conceptualizes the process through which a proposed concept, model, topic, theory etc. is taken up by some practice. Fullan and Stiegelbauer (1991) distinguished three sub-processes in which an innovation is made work (or not) in order to produce outcomes (Fig. 1). The processes that eventually lead up to and end with the decision to take up a specific innovation proposal have been called initiation phase (also mobilization or adoption). In the implementation phase (i.e. "implementation" in a more narrow sense) participants attempt to use the innovation proposal (or the curriculum in our case) in order to change their practice. Frequently, extra support for translating the innovatory ideas into reality is offered on a project basis. Thus, while the initiation phase is
concerned with the *nominal use* of a curriculum, the implementation phase focuses on the *actual use*. The study of implementation processes is concerned "with the nature and extent of actual change, as well as the factors and processes that influence how and what changes are achieved." (Fullan, 1994, p.2839) Thereby, it aims to find out what type of extra support in the 'project phase' is appropriate to promote actual use of the innovation. In the *continuation phase* (also called institutionalization, incorporation, or routinization) the innovation (or what has been made out of the innovation during implementation) is built into the routine organization, and extra support (if there had been any during the implementation phase) is withdrawn. Thus, while implementation is concerned with initial use of the innovation under project conditions, continuation deals with mature use under standard conditions.

2. General Strategies of Implementation

How to deal with the "implementation problem", i.e. the problem that so many curricula have not been implemented, or positively: of stimulating a process in which a target group is changing their practices in a way which is considered as improvement? Following Fullan (1983, p. 493), two *different general approaches* may be contrasted:

The *programmed approach* (or "fidelity approach") aims to solve the implementation problem by concentrating on flaws in the *specification of the "product"*, e.g. (a) gaps in the existing specification of innovations practices; (b) failure to articulate the innovation's implication for teachers behavior, and (c) theoretical inadequacies with respect to identified means for achieving the intended outcomes of an innovation. (Leithwood and Montgomery 1980, p.23).

In other words, the specification of the curriculum and of the implementation process is the problem; had they been clearer, problems of implementation would be fewer.

![Fig. 2: Curriculum making in the "programmed approach"](image)

A contrasting conceptualization of the implementation problem is provided by the *adaptive-evolutionary approach* which accepts that the innovation as it has been devised will be modified in the course of its implementation. This is not only seen as just a feature of mundane circumstances wise and realistic persons have to accept but as an essential characteristic of implementation. This resonates a central finding of the Rand Change Agent Study: "The primary feature of effective implementation could be called 'mutual adaptation'
in which the project is adapted to its institutional context and organizational patterns are adapted to meet the demands of the project." (Berman and McLaughlin 1977, p.5).

Particularly with complex innovations, this approach claims that it is conceptually unsound, socially unacceptable, and empirically impossible to solve the implementation problem by programming the persons concerned with putting the innovation into reality through detailed elaborations of the desired practice and step by step specifications for the process of implementation. Rather, innovators to provide their innovation, e.g. a new curriculum, to their audience as "intelligent hypotheses" (Stenhouse 1975), but invite practitioners to rethink it and further develop it for the specific circumstances they are working in. They expect, even invite negotiation and transaction. They aim to stimulate practitioners to use their practical situational knowledge for implementation and for modifying the original models according to the demands and resources of the specific locality.

Fig. 3: Curriculum making in the "adaptive-evolutionary approach"

| initiation | ← shaping |
| implementation | ← of |
| continuation | ← the |
| outcome | ← innovation |

Excursus: Stenhouse's image of the role of teachers in curriculum development

Let me elaborate the arguments which underpin an adaptive-evolutionary approach by reference to Stenhouse's (1975) Humanities Curriculum Project which was considered by Goodlad (1994, p.1264) as one of "only a few instances of well-developed curricula that provided students experiential encounters with the problems and issues of their world". Stenhouse argued against the idea to achieve quality changes of educational practice by "programming" teacher behavior (maybe to the extent of "teacher proof curricula"). To by-pass collaboration of teachers means to by-pass their rationality and their ingenuity, and this would not solve the implementation problem, but, on the contrary, make it worse. It is the practitioners who must bring a curriculum idea to life in their concrete interaction with specific students under local circumstances.

For Stenhouse (1975, p.142), curricula are attempts to communicate - hopefully intelligent – specifications of educational ideas and practices to teachers in order to stimulate their discussion, experimentation and critique. A curriculum is a hypothesis, a starting point for reflection and development done by responsible professionals (Stenhouse 1975, p.25). "A curriculum is an attempt to communicate the essential principles and features of an educational proposal in such a form that it is open to critical scrutiny and capable of effective translation into practice." (Stenhouse 1975, p.4).
Teachers are sometimes sceptical of the innovative products of researchers and curriculum developers. This maybe unpleasant for the developers, however, as Stenhouse argues, teachers' "pragmatic scepticism" should be taken as an impulse of questioning, of wanting to know better, of wanting to develop – in short: as an impulse to research. Even in 1975, Stenhouse had titled a chapter of his introduction to curriculum research with "teacher as researcher".

If one aims "quality practice" one cannot wish that practitioners take a curriculum proposal literally, that they work towards a one-to-one translation of the curriculum proposal into practice, that they "apply" it the local practice as true as possible to the original intentions, since it is – as knowledge in general – preliminary, hypothetical, incomplete, more or less de-contextualized and worth of being scrutinized and developed. Rather, one must wish that teachers take the specific circumstances of their locality and of their constituencies into account in order to produce and evaluate a local version of the curriculum which is adapted to what is productive and feasible under these specific circumstances. "The mistake is to see the classroom as a place to apply laboratory findings rather than as a place to refute or confirm them. Curriculum workers need to share the psychologists' curiosity about the process of learning rather than to be dominated by their conclusions." (Stenhouse 1975, p.26).

Thus, the main actors of implementation are the practitioners themselves, because they are responsible for the educational process and they cannot pass on this responsibility to external agencies (Stenhouse 1985, p.57). External agencies and persons, such as researchers, curriculum developers, in-service trainers may support and stimulate the development of practice; decisions about initiating development and the control over its direction are the realm of practitioners' professional judgment (Stenhouse 1985, p.104).

For Stenhouse, quality curriculum implementation necessitates curriculum research and evaluation as well as teacher development in the process of implementation and under practitioners' participation. Implementation must attend to specific local conditions and to process experiences of the persons involved in the process of implementation (Schön, 1987). Curriculum development is not just the production of written goals and materials before classroom practice but, at the end, concrete interaction in the classroom between learners and teachers aiming to develop situations with high learning potential.

End of excursus

To sum up this comparison of approaches to implementation: While for the programmed approach curriculum development takes exclusively place before implementation, and implementation is application of pre-specified models, for the adaptive-evolutionary approach the curriculum is also made during and through implementation. In the programmed approach an implementation is evaluated through the correspondence between the actual use of the innovation and the developers' intentions (e.g. Leithwood and Montgomery 1980, p.9). An adaptive-evolutionary approach cannot just test the effects of an innovation against a set of pre-specified objectives, since responsibility for practice will ask for evaluating the overall effects, i.e. including side-effects (Schön, 1983). Thus, an evaluation must "provide a comprehensive understanding of the complex reality (or realities) surrounding the programme" in order to "illuminate" the state of the innovation and the options for its further development for the different constituencies involved (Partlett and Hamilton 1977, p.21).
The *programmed approach* has certain strengths: It takes care to communicate its intentions and ways of implementation as clear as possible and, thus, its evaluation criteria are unambiguous. However, it has also some weaknesses, the most important of which are, first, it is only suitable for such innovations which are actually programmable. Many researchers claim that curricula for more complex educational goals are not easily programmable because our knowledge about the conditions of application is not sufficient. Secondly, needs and characteristics of persons and organizations in different regions may vary so much that some leeway is desirable in order to cope with situational implementation problems.

The *adaptive-evolutionary approach* is strong in adapting an innovation to situational characteristics. It also claims that complex changes necessitate relearning and, thus, invites participants to participate actively in the process of implementation which is seen as a prime opportunity for internalizing the main characteristics of the innovation. Its main weaknesses are: first, problems may arise because of ambiguous objectives, variation of ways of implementation, and shifting evaluation criteria. Secondly, evaluation of success is difficult and may vary between different persons and constituencies because no common criteria are available from the outset (Fullan 1983, p. 496).

Similarly, Berman (1980) has argued that both approaches have their merits and that the implementation approach should be chosen according to its fit to the specific implementation situation (Fig. 4). Thus, the programmed approach is appropriate if the amount of change intended is small or orchestrated in a gradual manner, if the curriculum may be specified according to tested and widely known teaching methods, if the persons concerned by the implementation agree to objectives and methods, if the school is comparatively integrated and its environment (e.g. the community) comparatively stable. Where these conditions are not met, an adaptive strategy may be more appropriate (Fullan 1983, p.498)

### Fig. 4: Indication for curriculum approaches (after Berman 1980)

<table>
<thead>
<tr>
<th></th>
<th>Programmed approach</th>
<th>Adaptive-evolutionary</th>
</tr>
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<tbody>
<tr>
<td>amount of change</td>
<td>small, step by step</td>
<td>big</td>
</tr>
<tr>
<td>curriculum technology</td>
<td>fixed, tested and known methods</td>
<td>adaptive, open methods</td>
</tr>
<tr>
<td>attitude of participants</td>
<td>agreement</td>
<td>conflict</td>
</tr>
<tr>
<td>integration/ organization</td>
<td>high integration</td>
<td>diversity</td>
</tr>
<tr>
<td>stability of environment</td>
<td>stable</td>
<td>unstable</td>
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In practice, any practical implementation project will be situated somewhere between the extremes of the dichotomy just introduced. However in my view, it makes sense for curriculum developers to ask themselves what type of solution of the implementation problem they - implicitly or explicitly – favor through their organization of the implementation process, and if this fits to the messages their curriculum implies and to the localities it has to work in.

3. Facilitating and limiting factors for implementation

Whatever the general strategy of implementation might be, it makes sense to know more about factors affecting implementation. Although there are a lot of individual and often contradictory research results in different implementation localities, there is, nevertheless,
some convergence of research findings about key factors (Fullan 1994, p.2840; see Appendix "Factors affecting implementation" for a summary). I shall use a heuristic distinction by Fullan (1991, 1994) and first, present some groups of factors affecting implementation and in the following section, I shall turn to more comprehensive "key themes" or process characteristics of implementation processes.

A. Characteristics of the innovation itself

Characteristics of the innovation itself, in our case of the curriculum, affect the process of implementation. It is not surprising that the higher a (perceived or felt) need for the solutions the innovation proposes is, the better the chances for implementation are. Usually, a general feeling of need or the expression of need by some political body or by academia is not enough, rather this need must be perceived by the constituencies directly involved in the implementation. It follows that "careful examination of whether or not [the changes] address priority needs" (Fullan 1994, p.2840) lays important groundwork before and during the production phase of a curriculum; and that frequent communication and open discussion of the curriculum's merit for coping with felt need must maintain and develop an awareness of this topic during the implementation process.

However, there are three complications with straightforwardly addressing needs (Fullan 1994, p.2840): First, there is a need for the solutions offered by a curriculum must not just be 'one among many others'. Among the "overloaded improvement agendas" of today's schools there is often competition between various innovation proposals which leads not too rarely to vague development agendas within which no critical mass of improvement energy can be accumulated behind any of the projects. "Developing a vision" (Section 4) could be used as an instrument to prioritize among a set of desirables. Secondly and especially in the case of complex changes, both precise needs and solutions offered by the curriculum are not clear from the beginning. Thirdly, need interacts with other factors (see below).

Another crucial factor is the innovation's clarity (about goals and means). Curriculum research unearthed examples of educational innovations where practitioners were not clear about what they were expected to do differently – what change meant for them in practice. At least in initial implementation phases teachers relish concreteness and tangibility. They expect that teaching strategies are clearly described and material is well-thought of. The proposal should be clear about ways of doing, but not too linear and restricting in the sense that just one way of doing is advocated and no alternatives are possible. This need for clarity has been interpreted as expression of a feeling of role ambiguity in a situation of uncertainty produced by the new challenges of the innovation on one side and by the partly lacking competencies on the teachers' part. It was also found that a more flexible approach may be appropriate in later phases of implementation when teachers have strengthened their feeling of competence with respect to the innovation (Lütgert and Stephan, 1983).

What does this finding mean for an adaptive-evolutionary approach? Wasn't it saying to be not too clear about ways of teaching to allow teachers' experimentation? In my view "no". Stenhouse advocated the curriculum as an 'intelligent proposal' and he certainly meant by this to be as clear as possible about what the proposal is. But at the same time, he thought, teachers should be encouraged and supported by resources and structure to evaluate this proposal under specific circumstances and to develop it further.

A third factor is complexity which reflects the amount of new skills, altered beliefs und different materials etc. required by an innovation. "… simple changes may be easier to carry
out, but they may not make much of a difference. Complex changes promise to accomplish more, but they also demand more effort, and failure takes a greater toll. The answer seems to be to break complex changes into components and implement them in a divisible and/or incremental manner.” (Fullan 1994, p.2841; Thomas 1994, p.1852).

A fourth factor lies in the (perceived) quality and practicality of the innovation proposal. Again, it is not (only) the quality a panel of curriculum developers would attribute to the curriculum proposal, but the quality as it is perceived by the relevant actors supposed to implement the curriculum. One might distinguish several aspects of quality in this respect. Firstly (but not always foremost), there is conceptual quality flowing from plausibility and coherence of the conceptual elements employed. There is formal or communicative quality coming from the language, graphical and social design of the presentation of the innovation before and during the implementation process. And there is practical or logistic quality stemming from the availability of materials and other resources, such as, for example, time for development work or the consultation of external experts. As most innovation address 'urgent and ambitious needs', it happens that "decisions are frequently made without the follow-up or preparation time necessary to generate adequate materials" (Fullan 1994, p.2841).

It must be stressed that "quality" with respect to implementation points to the perceptions of the different stakeholders: Thus, an essential feature of quality is contextual suitability: It has been frequently demonstrated that imported programs rarely work equally well in all contexts (e.g. Huberman and Miles, 1984). Innovation proposals must fit to available funds, specific student characteristics, the communities' language patterns, teachers' abilities, parents' expectations, cultural values and much more (Thomas 1994, p.1853).

"Quality" also means that a curriculum can pass the test of the 'practicality ethic of teachers' (Doyle and Ponder, 1977-1978): Teachers appreciate these ideas, proposals or teaching methods which have proven to "work" in practice or which promise by their appearance of practicality to do so. Those proposals are considered as 'practical' which "address salient needs, that fit well with the teacher's situation, that are focused and that include concrete how-to-do-possibilities. 'Practical' does not necessarily mean 'easy' but it does mean the presence of next steps." (Fullan 1994, p.2841)

**Fig. 5: Overview of factors affecting implementation**

**A. Characteristics of the innovation itself**
- (perceived or felt) need
- clarity (about goals and means)
- complexity
- quality, contextual suitability and practicality

**B. Local characteristics**
- regional administration (e.g. school district)
  - history of negative experiences
  - adequate follow-through
  - active knowledge and understanding
  - active support
- community characteristics
- contextual stability
C. Organization
C1. Actors
• management (e.g. principal and school management team)
  - level of commitment
  - obtaining resources
  - shielding from interference
  - encouraging staff / recognition
  - adapting standard procedures
• teachers
  - competencies and attitudes
  - decision-making participation
  - quality of collegial relationships
• students' and other participants' competencies and attitudes

C2. Organizational characteristics
• compatibility of the innovation goals with the strategic goals of the organization
• organizational structures and processes
• system of incentives and career patterns
• characteristics of the existing curriculum and assessment procedures
• organizational culture

D. Government and external agencies
• quality of relationships between central and local actors
• resource support and training

B. Local characteristics
A second set of factors focuses on local decision processes and local characteristics of the implementation: First, there is the regional administration (e.g. school district): The attitude of regional administrators, inspectors and the like towards the local implementation process is essential if change is meant to be serious. Without support of regional administrators change may happen with individual teachers or single schools but it will most likely remain isolated in some innovative pockets without affecting the broader system. Just 'moral support' - in the sense of being given good words without any concrete implementation follow-through - will no be enough. "Teachers and others know enough not to take change seriously unless local administrators demonstrate through actions that they should." (Fullan, 1994, p. 2842)

There have been too many educational innovations without adequate follow-through. In some regions there is a history of negative experiences with previous implementation attempts which in itself is an unfavorable condition for change since system members may have built up a cynical or apathetic attitude towards change. Local administrators must show specific forms of active support including enduring (not just initial) support for school management and teachers (e.g. through offers of process coaching, expert consultation, demonstrations or excursions to alternative practices, in-service training etc.), through realistic time plans and resourcing, and through an adequate information system about the innovation and its implementation (Fullan 1983, p.492). And they must demonstrate active knowledge and understanding both of the attempted change and the processes of putting it into reality in order to provide conducive conditions for the implementation.
Another factor are **community characteristics** (as well as characteristics of the 'school board' where it has some influence on the management of the school). Even where communities are "not directly involved in implementation ... they can become activated against certain innovations" (Fullan 1994, p.2842) if the planning and implementation process does not attend to the political undercurrents in the school's surrounding community. On the other hand, the inclusion of non-professional, such as parents and the public, – at least in settings where community members are used to influence educational practice - can uncover objections and helps to accommodate to specific circumstances (see Thomas 1994, p.1855). Then, parents may be "one of the most powerful leverages to better implementation" (Fullan 1994, p.2842) if they are actively included in the implementation strategy through an adequate information system or realistic offers to participate in key phases of development and implementation.

Finally, **contextual stability** makes a difference. It is much easier to successfully advance an implementation within a stable environment. "Marked social change usually disrupts reform projects that are already on the way." (Thomas 1994, p.1853)

**C. Organizational characteristics**

**C1. Actors**

Another crucial factor for implementation is the characteristics of the organization (e.g. the school) which is the venue for implementation, and, in particular, the role of the **management**, i.e. in the case of a school: the principal and the school management team. There is broad research evidence that principals, headpersons and school management teams cannot change schools just on their own, but that they are the single most influential group of persons to make change processes fail. "The principal is the most likely person to be in a position to shape the organizational conditions necessary for success such as the development of shared goals, collaborative work structures and climates, and procedures for monitoring results." (Fullan 1994, p.2842) Change processes are in need of the management's active support and participation – not necessarily as curriculum experts, but as initiators, as 'change leaders' (Fullan 1983, p.492).

Thus, the school leaders' **level of commitment** is a crucial feature: "The degree to which people are committed to a reform is reflected in the time and energy they devote to its implementation and in the extent to which they remain faithful to their role in the face of opposition and operational difficulties." (Thomas 1994, p.1852), Commitment is important at all levels of an educational hierarchy but particularly among the personnel at the top, so e.g. among school principals or top administrators of districts or ministers of education. They are in the position to give resources and impose both rewards and penalties, and they provide well-observed images for how seriously the innovation is to be taken.

Firestone and Corbett (1988) have identified four **leadership functions** which facilitate educational change:

- **Obtaining resources** (e.g. for equipment, supplies, training, clerical support and free time)
- **Shielding the project from outside interference** (e.g. disruption of teachers' working time, resolving problems; protecting from attacks by opponents and from many competing demands)
- **Encouraging staff members** and furnishing recognition from peers, experts and supervisors
Adapting standard operating procedures to the needs of the project at an early stage in the reform process and, as Huberman and Miles (1984) suggested, stabilise and codify the new practices in school house operating rules, revised curricula, training programs, evaluation procedures and routine funding (Thomas 1994, p. 1854). In other words, the earlier – even in the 'project phase' of implementation – the curriculum is partially built into the routine operations of the school, the better.

In reality, headpersons frequently do not play an active role in implementation – not always because they do not like the innovation itself – but sometimes because they find it difficult to transform their traditional, more passive role (at least in the school systems of German speaking countries) into a new and more active role as 'facilitator of change'. Thus, some implementation programs provide specific offers for principals and school management, e.g. specific workshops or optional coaching. These are to help them transform and maintain a conducive role among implementation processes which frequently do not pass without some conflict and pressure on the leader's role (Altrichter and Posch, 1999).

Teachers, their commitment and attitudes, competences, and interaction patterns make up another crucial group of factors for implementation. Both individual and collegial aspects are important. Teachers are a constant factor in the education system and thus have a key role for classroom innovation (Havelock, 1970). If they are not motivated to engage with an innovation, then nothing will happen. In the German discussion, Havelock's position has been criticised in binding curriculum development to the "weakest element of the chain" (see Haller 1983, p.527). However, this involves, in my view, overstating Havelock's argument in the way that teachers have to accept fully the innovation at any time of the implementation process. Certainly, this cannot be expected. Certainly, every real innovation will involve some aspects which are new for teachers and which will encounter some sceptical reaction. Such discrepancies between claims of the innovation and acceptance of teachers may be important starting points for further development. However, the relationship between "irritation" (provided through the challenging elements of the curriculum and its implementation) and "acceptance" must be in such a balance that participants are prepared to embark and continue with the implementation process. Curriculum research shows that it is possible to deal constructively with such discrepancies in implementation processes, but it also shows that it is easier in situations of face-to-face-contact and that, again, it is much more difficult to generalise results of those face-to-face negotiations to a broader group of users (Haller, 1983, p.527).

Participation in decision-making: Traditionally educational innovation has tended to follow a top-down pattern. However, it was frequently shown that including local personnel fosters more effective implementation. "Early participation increases teachers' willingness to continue new practices after the initial incentives have been withdrawn. Engaging teachers in their planning process also helps to equip them with skills required by the innovation and enhances the likelihood that the reform will be adapted to local circumstances." (Thomas 1994, p.1855) Thus, one of the mottoes of organisational development has been taken up also by implementation projects, i.e. to make persons affected by change to persons involved in change (e.g. Reinmann-Rothmeier and Mandl, 1999, p.68).

Certainly, the individual teacher's competencies and attitudes towards change itself and towards the specific innovation intended are important factors contributing to the quality and direction of the change process. Some schools, however, have more change-oriented teachers.
on their staff than others. This is not only due to recruitment but also – as school quality research has shown – an effect of specific school cultures (e.g. Purkey and Smith 1991; Eder and Altrichter 2005).

Change involves the development of new practices and beliefs, i.e. it involves learning. Where these new practices and beliefs are not trivial we must assume that these processes extend over time and that they are fraught with feelings of being de-skilled, not knowing what to do, lacking instruments, competencies, and resources, etc. Since it is an innovation the learning process will refer to practices already established, i.e. it will involve re-learning. Thus, the process of taking up an innovation may also be described in terms of a learning process of individuals, groups, and organizations, and actually implementation projects only can profit from what Mandl (in this volume) has explained as a constructivist view of learning.

As alluded to above, teachers seem to have changing interests during different phases of implementation. Initially, concrete proposal and non-paternalistic support seem to be important in order to counteract the feelings of being de-skilled and of time pressure which are connected with the innovation challenge. Later, a more comprehensive view on the substantive and methodical implications of the innovation proposal becomes possible. No wonder if the implementations process is seen as a "dynamic process of appropriating curricular concepts" (Lütgert and Stephan 1983, p.508).

Individual teachers' learning is socially situated in a network of co-teachers, managers, administrators, and other relevant participants. It will be easier if it is situated in a such network which is both sympathetic and competent with respect to the changes aspired since it will be possible to collegially fill in individual's gaps of motivation and qualification. "New meanings, behaviors, skills, and beliefs depend significantly on whether teachers are working as isolated individuals or are exchanging ideas, support, and positive feelings about their work. The quality of working relationships among teachers is strongly related to implementation. Collegiality, open communication, trust, support, and help, learning on the job, getting results, and job satisfaction and morale are closely interrelated." (Fullan 1994, 2843) Thus, some researchers equal successful implementation with succeeding in building up a 'community of learners' with respect to the innovation, Such a 'community' invests in different occasions and instruments of collaborating, sharing, and synthesizing individual knowledge and research in order to make full use of the expertise which is 'distributed' within the relevant community and outside of it (Reinmann-Rothmeier and Mandl 1999, pp. 306 and 310; Altrichter 2005).

Lave and Wenger (1991) have insisted that learning - by virtue of its social situatedness - also involves developing a specific identity in and vis a vis the respective 'community'. Similarly, to implement an innovation means for the practitioners involved in a long-term commitment to practice the innovation and to give it some centrality in their image of the profession and the organization. Thus, implementation will be connected with some pressure to transform professional identity, and it will only be considered successful if this transformation is not just an individual one but is accompanied by other individuals' (i.e. members of the organization to be transformed or of the 'community of learning') likewise transformation, or to put it in other words: some by some transformation of (what is to count as) the respective community of practice.

Certainly, innovations necessitate also other non-professional participants' learning. In the case of curricular innovations it is obvious that students' relevant competencies and attitudes
are an important factor in implementation. If the innovative proposal is unclear, against their perceived needs, over- or under-demanding etc. it may lose students' active participation (see the example in Doyle and Ponder, 1977-1978). Also janitors, clerical staff and other participants may be affected by the innovation, and in a position to actively support or block implementation.

C2. Organizational characteristics

Compatibility of the goals of the innovation and its implementation with the strategic long-term goals of the organization into which the innovation is to be implemented is crucial, too (Sonntag et al, 1998, p.341; Euler and Sloane, 1998, p.325). The same holds true for situational characteristics: Organizational structures, instruments and processes are important factors for implementation. An innovation usually aims at directly transforming some organizational structures and processes (e.g. new material for collaborative learning) and in the process of doing so, also indirectly puts pressure on other organizational structures and processes (e.g. teachers' work organization, time tabling, decision making procedures). The system of incentives and the career patterns valid in the organization to be changed must be re-thought in order to be in consonance with the innovation (Sonntag et al, 1998, p.343). For curricular innovations the structure of the existing curriculum and assessment procedures are particularly relevant. Attempting to change teaching and learning styles while syllabi and assessments remain unaltered will most likely run into difficulties (Reinmann-Rothmeier and Mandl 1999, p.294).

Thus, implementation must work towards a fit between the culture of the organization and both the culture of the innovation proposal and its implementation process. Intensive collaboration, collegial reflection and sharing of individual knowledge are features which to some extent, run counter to the culture of traditional schools (at least in German speaking countries) which may e.g. characterized by a frame of mind called "autonomy-parity-pattern" by Lortie (1975). This pattern is characterized by two rules which are considered crucial for smooth interaction between teachers: First, no grown-up person should interfere in a teacher's classroom ("autonomy"). Secondly, all teachers are to be treated equally, regardless of their actual competencies, energy invested, and qualities displayed. It has been shown that new challenges, such as school development or quality evaluation, tend to interfere with these rules since they usually opt for more coordination and sharpening profiles of the organization (which interferes with autonomy). And they are in need of delegation and differential taking up of development roles, and of evaluation which is necessary for rationally steering more autonomous organizations (which interferes with "parity"; Altrichter, 2000). In a recent study in vocational upper secondary schools we found that the relative weight of teachers who discard "autonomy" and "parity" as guiding principles for collegial life in schools is decisive for successful engagement in school development (Eder and Altrichter 2002).

The culture of learning valid in an organisation is particularly important because it does not only refer – in the case of curriculum implementation - to central content aspects of the innovation, but also to conditions of learning during the process of implementation. Using Weinert’s definition, we see the organizational culture of learning as the totality of forms of learning and styles of teaching which are typical for an organisation at a given time including the anthropological, psychological, societal and educational orientation on which they are based (Weinert, 1997, p.12). It is considered conducive for implementation

- if learning is awarded a high profile in the goals, vision, resources, and instruments of an organization (Sonntag et al, 1998, pp. 344ff)
• if there are forums for learning and information exchange in the regular operation of the organisation (e.g. the cases in Willke 1995, pp.58ff; Mingers, 1998)
• if there are conducive images of learning continuously represented in the organisation by management and other participants; i.e. that the competent learner is valued, not just the full expert who is right in any case (Reinmann-Rothmeier and Mandl 1999, p.307).

It follows that innovation also involves or necessitates an innovation of school as an organization, i.e. a process of system change or organizational learning (Euler and Sloane 1998, p.320). Organizational learning is – as has been frequently described (Altrichter et al., 1998) – not a straightforward process because it deals with transforming structures which have been and are continuously partially self-produced and reinforced by the actors in the organization to be changed (Giddens 1988). Consequently, we will expect some 'resistance' in the course of the implementation process and adverse reaction to innovation does not always aim at the characteristics of the innovation itself but sometimes at the pressure to transform one's way of working and relating to colleagues in schools.

D. Government and other agencies

Priorities for education which arise from political forces, lobbying of interest groups and public concerns channel resources and gratification, "put pressure on local districts (sometimes to the point of mandates) and also provide various incentives for changing in the desired direction." (Fullan, 1994, p.2843) Its instruments are legislation, regional guidelines, incentives, sponsored projects etc. Fullan (ibid.) is critical of government agencies which all too often "have been preoccupied with policy and program adoption, and have vastly underestimated the problems and processes of implementation. The policy maker and the local practitioner inhabit different worlds, each side ignorant of the subjective world of the other."

In fact, the quality of relationships between central and local actors is a key issue of implementation. However, all too often it has come "in the form of episodic events rather than processes: for example, submission of requests for money, intermittent progress reports on what is being done, external evaluations, all amounting to paper work, rather than people work." (Fullan, 1994, p.2843)

Through resource support and training (Lütgert and Stephan, 1983, p.510) external agencies can promote curriculum implementation. "... through resource support, standardization, and closer monitoring, state departments of education have sometimes directly influenced implementation of specific objectives, especially when local conditions were favorable. Mostly, however, lack of role clarity, ambiguity about expectations, absence of regular interpersonal communication, ambivalence between authority and support roles of external agencies, and solutions that do not work have combined to frustrate implementation." (Fullan, 1994, p.2843)

4. Process characteristics of successful implementation

A more holistic and dynamic conceptualization is provided by a formulation of key process characteristics in successful improvement efforts (e.g. Louis and Miles, 1990). According to Fullan (1994, p.2843) there is a small number of powerful themes which - in combination - make a difference." What are these themes?
Preparation, initiation and participation
Reform needs some impetus to get started. Some preparatory collection and analysis of data about the state of the system to be innovated will help to focus energy (see Sonntag et al., 1998, p.335; Euler and Sloane, 1998, p.325). A 'project architecture' will have to be built up which includes formal and informal power centers and assigns specific roles to different constituencies involved and which is organizing social places and instruments for participation (op.cit., p.334ff; Königswieser and Exner 1999, p.45ff).

Although 'participation and empowerment' are key themes of the whole implementation process, that does not mean that widespread involvement at initial stages is "either feasible or effective". To introduce an innovation at the same time to the whole target group may not be the wisest strategy (e.g. Sonntag et al, 1998, p.344). "It is more likely the case that small groups of people begin and, if successful, build momentum. Active initiation, starting small and thinking big, bias for action, and learning by doing are all aspects of making change more manageable, by getting the process under way in a desirable direction." (Fullan 1994, p.2846)

Vision building
If an organization or a project has a vision, it permeates the (project) organization with value and purpose which give direction and driving power for development (see Fullan 1994, p.2844). According to Louis and Miles (1990) vision has two aspects, an image of the organization to be changed, what it could or should look like, and an image of the change process, for the strategy for getting there. "While virtually everyone agrees that vision is crucial, the practice of vision building is not well understood." (Fullan 1994, p.2844) Most literature talks about what should or could be, however, there are only a few more thorough empirical studies of actual processes of vision building in education (e.g. Krainz-Dürr, 2001).

Evolutionary Development
"For major change, highly specified planning is unwise. 'Have a plan, but learn by doing.'" (Fullan 1994, p.2844). Successful schools, e.g. in the Louis and Miles (1990) study, "adapted their plans as they went along to improve the fit between the change and conditions in the school to take advantage of unexpected developments and opportunities." (Fullan 1994, p.2844). The art of implementation lies in blending top-down initiatives and bottom-up participation. Obviously, some pragmatic flexibility is needed "that permits a reform program to accommodate unexpected, uncontrollable events while still attempting to preserve the main trust of the plan." (Thomas 1994, p.1853)

Initiative-taking and empowerment
In Louis and Miles' (1990) study, "leaders in successful schools supported and stimulated initiative-taking by others; set up cross-hierarchical steering groups consisting of teachers, administrators, and sometimes parents and students; and delegated authority and resources to the steering group, while maintaining active involvement with the groups." (Fullan 1994, p.2844)

For organizational leaders it is obviously essential to get people to act and interact in purposeful directions, and if they do so, also to support them, to give them resources and to delegate power - without themselves (as a leading persons) fully pulling out of the process. Collaborative work cultures which may develop out of these networks of interaction provide support for the individuals, but also continuous motivation and pressure to go ahead.
Pressure and support

Innovation research teaches us that it is not as simply as 'pressure' equals bad and 'support' is good. The reason is that in organizations there are "many forces maintaining the status quo. When change occurs it is because some pressure has built up that leads to action." (Fullan 1994, p.2846) 'Pressure' is not to be equated with brute power and oppression, and in fact, such type of 'pressure' would rarely work effectively. Various arrangements of interaction between the implementers, such as meetings, collaborative working groups, presentation meetings etc., serve "to integrate both pressure and support. One of the reasons that peer coaching works so effectively is that it combines pressure and support in a seamless way." (ibid.)

As I said: 'pressure' is not simply bad and 'support' is good. Rather it seems that one without the other is bad for implementation. "Pressure without support leads to resistance and alienation; support without pressure leads to drift or waste of resources." (ibid.) An elaboration of this idea has been proposed by Strittmatter (2001). He argues that in order to sustain change processes in schools there must be both motives of ability (can), necessity (must) and volition (wish). They are in a multiplicative relationship: If one of these three motivational areas is nil, the sum will be nil, i.e. the overall motivational energy will not be sufficient to sustain an extended change process.

Staff development and resource assistance

Innovation necessitates (partially) new expertise. Educational establishments would rarely attempt to acquire this expertise by hiring additional personnel. Thus, innovation involves a process of relearning competencies and attitudes for the existing personnel. Many formats for training staff have been developed, such as e.g. written directions, periodicals, teachers' guidebooks, live or videotaped lectures and demonstrations, in-service workshops, on-site supervision (Thomas 1994, p.1856). However, whenever relearning is to mean not only acquisition of new verbal power but of new and stabilised skills and action patterns, then relearning must be based on action and interaction over an extended time span (see Gruber and Renkl 2000, p.169; Stenhouse 1975).

Many attempts at change fail because they underestimate the individual and social energy that is necessary for re-learning. Staff development is too often designed as a one-off initiative at too early a stage of the change process (Breuer and Höhn, 1998; Reinmann-Rothmeier and Mandl, 1999, p.68). Pre-implementation training may be helpful for orienting people towards new aims and practices, however, support is most crucial when participants actually try to implement new approaches, i.e. during implementation, and in particular, during early stages of implementation (e.g. Reinmann-Rothmeier and Mandl 1999, p.67). "Learning by doing, concrete role models, meetings with resource consultants and other implementers, practice of the behavior, the fits and starts of cumulative, ambivalent, gradual self-confidence are all crucial. Training approaches to implementation are successful when they combine concrete teacher-specific training activities, ongoing continuous assistance and support during the process of implementation, and regular meetings with peers and others." (Fullan 1994, p.2845)

Monitoring, evaluation and problem-coping

All serious improvement programs will encounter problems. However, it makes a difference whether innovators are prepared to identify them quickly and develop coping measures or whether they avoid to face them. Thus, self-reflection, self-evaluation and monitoring both the outcomes and the process of change is an essential element of every effective implementation strategy (Sonntag et al, 1998, p.342ff; Reinmann-Rothmeier and Mandl,
Monitoring does not just fulfill a 'critical function' in identifying problems and failure. It has also a 'constructive' function in multiple respects: Certainly, it is meant to orient adaptation measures. Organized effectively, it may provide some emotional support when implementation problems arise and when participants are in danger of falling into the "implementation dip", into the feeling that situational control is lost among changing circumstances and 'everything is getting worse'. Further, it may give access to good practical ideas which in traditional school cultures too often remain unknown and isolated as individual teachers' knowledge (Altrichter et al, 1993, p.176). Thus, monitoring may fuel exchange of implementation experience and collaborative planning of next steps by users and curriculum makers (Lütgert and Stephan, 1983, p.510).

Although most innovation researchers would agree to the importance of evaluation and monitoring of progress, it is "probably one of the most difficult and complex strategies for change 'to get right'. … Accountability and improvement can be effectively interwoven, but it requires great sophistication." (Fullan and Stiegelbauer, 1991, p.87) Evaluation is very often planned too late. People in initial phases of an innovation are pre-occupied with the "more practical" issues of making the innovation work. As they feel that not everything is working as smoothly as they had hoped, they become more wary of evaluation because they fear that mistakes will become visible. Evaluation also threatens the long-standing culture of autonomy and parity in traditional schools by intruding into the privacy of the classroom and producing information which allows to differentiate between teachers (Altrichter, 2000).

However, innovative schools do not only monitor progress, they also act upon the information collected in order to redirect their change process. Louis and Miles (1990) found that "unsuccessful sites used shallow coping strategies such as avoidance, denial, procrastination, people-shuffling, while successful sites engaged in deep problem-solving such as redesign, creating new roles, providing additional assistance and time and the like." (Fullan 1994, p.2845)

**Restructuring**

"Structure" is meant to "include organizational arrangements, roles, finance, governance, and formal policies which explicitly build on working conditions that support improvement." (Fullan 1994, p.2845) Our definition emphasized that innovation is always restructuring to some extent. In practice, the need e.g. for revised time tabling, shuffling resources, time for individual and team planning, time for visiting other colleagues or joint teaching, staff development policies and practices, new roles such as mentors and coaches etc. may surface during implementation. Where this task of restructuring is taken up explicitly and pro-actively in the course of the implementation (instead of waiting for the pressure to be so high that rearrangements cannot be avoided any longer), the chance of producing sustainable results will be higher.

**Intensive communication and relationships to external agencies**

In the perspective of systems theory organizations are social systems which are made up of a special form of communication, of decisions (Luhmann 1988, p.92; Willke 1994, p.114 and p.150ff). Organizational innovations aim at changing the decisions which are characteristic of the organization. In order to achieve this, phases of innovation must intensify the richness and variety of communication in an organization (Reinmann-Rothmeier and Mandl, 1999, p.73). Practically, a pro-active in-house information policy is meant to feed in communication with relevant information, and the establishment of forums of information exchange and collaboration are supposed to intensify innovation-relevant communication
(Sonntag et al., 1998, p.342). Also cross-departmental communication and exchange with external experts are supported in order to enhance the chance of seeing alternative solutions. But also clear and pro-active information and communication with the organization's environment and the interested public is important in order to avoid adverse reactions, to make the innovative changes understood, and, at times, to invite alternative perspectives (Reinmann-Rothmeier and Mandl 1999, p.307; 1999, p.76).

5. Conclusion

In this paper I have presented descriptions of implementation from three different angles, from the view of two broad 'philosophies' of implementation, from an analytic view on important factors contributing to successful implementation which have identified by innovation research, from the perspective of organizational developers formulating critical themes or process characteristics. Out of the overlaps between these perspectives an image of implementation is emerging which may be characterized by the following elements:

- Implementation involves changes in behaviors and beliefs and, thus, involves processes of learning. If these new practices and beliefs are not trivial, these processes will extend over time and will be fraught with feelings of being de-skilled, not knowing what to do, lacking instruments, competencies, and resources, etc.

Innovation requires both changes in action and attitude. Contrary to the usual assumption, "it seems that most people do not discover new understandings until they have delved into something. In many cases, changes in behavior precede rather than follow changes in belief." (Fullan 1994, p.2846) It follows first, that concrete instructions, materials, examples and coaching or peer interaction which help to develop and modify practices are essential for implementation. Secondly however, changes in belief are not futile. Rather, they are essential to make sense of the new practices, organize them and hold them together in a system of meaning which is a precondition for extended practice and flexible adaptation to varying circumstances.

- Implementation involves development and evaluation: To implement these new practices into a fairly complex new environment will not be done by just copying a master-plan or a model from some other place, but will involve some process of selection, construction, problem-solving, interpretation, and (re-)invention which 'situates' and changes the original model (Euler and Sloane 1998, p.319ff). This feature necessitates that the implementation process and its products is monitored as it proceeds, and that the information produced thereby is used for fine-tuning or re-directing the implementation process.

- Implementation is obviously complex: "Even if the need and the idea is right, the sheer complexity of the process of implementation, has, as it were, a sociological mind of its own, which frequently defies management even when all parties have the best of intentions." (Fullan 1994, p.2847)

- Implementation is an extended and dynamic process: Learning extends over time and will change the situation in which it is to be learned (Reinmann-Rothmeier-Mandl 1999, p.66). "Deeper meaning and solid change must be borne over time. With particular changes, especially complex ones, one must struggle through ambivalence before being sure that the new vision it workable and right …" (Fullan 1994, p.2841; my emphasis)

- Factors affecting successful implementation are in a systemic relationship: Set of factors "form a system of variables that interact to determine success of failure" (Fullan 1994, p.2840) "Single-factor theories of change are doomed to failure. … Effective implementation depends on the combination of all the factors …" (Fullan 1994, p.2846)
• More than that, implementation will involve **systemic change** and, thus, necessitate some **organization development** (Euler and Sloane, 1998, p.320). It follows that implementation will involve **learning processes on different levels** (Reimann-Rothmeier and Mandl 1999, p.66ff): Individual learning processes (as have been described above) will be complemented by group learning (e.g. exchange of knowledge and findings, mutual support, collaborative problem-solving) and organizational learning which aims for changing relevant structures, processes, and cultures in a way which resonates with the main thrust of the innovation.

• Implementation involves **participation, ownership and development of professional identities**. Innovators will want to stimulate persons involved to more comprehensive participation. This is seen as a necessary precondition for successful innovation which asks for practitioners' commitment and "ownership". Ownership in the sense of clarity, skill and commitment is not acquired easily; it is a progressive process which must be supported by the arrangements of the implementation process.

As social and cultural learning theories stress (Lave and Wenger, 1991; Bielaczyz and Collins 1999, p.275) learning new practices is interwoven with other actors' learning processes in a social setting, and is connected with processes of identity formation. Thus, implementation will always involve some **transformation of the professional identities** of the persons involved.

• Implementation of complex innovations does **not lend itself to a strict separation of phases of research, development and implementation**. On one hand, issues of implementation must be anticipated in early phases of conceiving an innovation (Reimann-Rothmeier and Mandl 1999, p.75). On the other hand, implementation itself must be seen as a process of further developing the innovation proposal and of researching its effects and transformations under specific local conditions. In this perspective, implementation is understood as an element of a circular process of conceiving implementing reflecting, and re-conceiving innovations proposals, or of theory building, theory application, and testing of theories (Euler and Sloane, 1998, p.322). If this argument makes sense, then research in implementation processes would hold more theoretical relevance than usually is attributed to it.

To tighten the relationship between development, implementation, and research – this is the shared message of Stenhouse's 'teacher as researcher'-model (Section 2) and the idea of 'modus 2-research' which is advocated by Reinmann-Rothmeier and Mandl (1999, p.71ff) as a complement to traditional (modus 1) research. They argue that knowledge should increasingly be developed in the context of its use; processes of problem formulation and solving should be based on heterarchic teams of persons from different disciplinary and professional backgrounds in a complex application-oriented environment. Modus 2-research opts against a strict separation between basic and application-oriented research: "Research becomes a cyclical process, in which theories and practical recommendations will be continuously analysed, tested in practice and revised, when necessary" *(op. cit., p.73)*

The complexity of the implementation process makes predictions of success risky. However, it makes it very profitable for curriculum makers to actively engage in this elusive process of supporting implementation. And it also makes it very "**profitable to monitor implementation** with care at each stage of the process, so that remedies may be applied periodically toward coping with unanticipated difficulties." (Thomas 1994, p.1852; my emphasis)
References


