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FUTURE TRENDS AND AIMS IN TEACHING AND LEARNING IN HIGHER EDUCATION

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1. Introduction: What is the question?

1.1 Global problems of the future

We read and learn about it in the newspapers and television almost every day or at last each week, we have heard about it again yesterday in the opening and key issue lectures, we know about it since years, at least since "Limits to growth" (the first report to the Club of Rome, cf. MEADOWS et al., 1973) and "The Global 2000 Report to the President" (1980). The future of all of us is less than ever a matter of course, societies cannot go on any longer just as they did up to now, life on our globe and even our planet itself are at stake. The arms race will kill all of us should the ever more dreadful weapons ever be actually employed in a war and is already killing many people in the world without a war indirectly through the absorption of resources they would need and could use for living and welfare (cf. BOTKIN et al., pp. 93 ff). The economic and especially the monetary system worldwide is organized in a way to heap ever more wealth and affluence on the upper tenth of the population and to make the other nine tenth poorer and poorer regardless of how much they strive. New technologies are invented and even implemented by administration or management under the sporn of worldwide competition much quicker than we, the citizens or employees concerned, could forecast and understand what they will mean for life and death (as in the case of laser), for employment and culture (as e. g. in micro-electronics), for nature and future (as e. g. in genetic technology). The natural resources are still consumed and the environment is polluted as if all these were inexhaustible - with environmental pollution and destruction going on in the less industrialized or developing countries even more rapidly than in the fully industrialized ones.

1.2 Probable trends - desired aims

These are the dangers which we face now and tomorrow, and how mankind will cope with them will be decisive for the state of the world in the year 2000. What then will be the answer of - among other institutions - the universities and colleges? Espe-

cially, to come nearer to our theme, in their capacity as institutions for teaching and learning, concerned with the human factor? This question I think is twofold: what will be the probable developments in teaching and learning in higher education, the trends to be extrapolated from what is already going on and most likely to continue? And what ought to be the answers to the challenges mentioned on the side of the universities, the aims, which at least we as educators would try to pursue - if necessary against some trends. Let us approach the first side, the trends, first.

2. Continuities and changes in teaching and learning in higher education in the years to come

What will teaching and learning in your institution probably look like by the year 2000, less than twenty years from now, if no extraordinary events or catastrophes intervene? How will you as members of the staff do your job at that time? Please try to figure this out and take a few minutes to meditate about this just by yourself, before you continue reading.

2.1 The futurologist's vision

In the literature dealing with possible futures of education the answers to my question generally read like this (cf. e. g. DEURINCK et al, 1974; FRAGNIERE, 1976, esp. 89 ff.; BOTKIN et al. 1980, esp. 146 ff., 153 ff.): Universities or generally institutions of higher education are open institutions in every sense: there is free access for learners, male and female, young and old, with or without the traditional entrance ticket ("Abitur" or whatsoever), and a high degree of permeability between the various institutions and courses; there is also a warm broad-mindedness in the academic teaching profession opening their job to all sorts of practitioners who have experience or skills to share with some learners. The organisation in time and space of teaching and learning is highly flexible, allowing for long and short term courses, for learning at presence or at distance, for any sort of combination of job and learning at any time in life. Entrance examinations are replaced by orientation and/or alloca-

tion phases, final examination by a great variety of specific certificates and all examinations in between by advice and consultation. With regard to content again all boundaries are blown up: the boundaries of the academic sphere are opened to polytechnic education, of scientific theory to practical problems and everyday experience; the complex societal or global or future problems, which are readily tackled, of course make for interdisciplinary work in teaching and learning and have done away with the borders between and hierarchical structures within disciplines. The forms of learning fit the pattern of project oriented studies, they are based on cooperative and differentiated group work - no lectures any more - and enhanced by computer accessible data retrieval systems on the one side and all the methods of simulation games on the other. What is to be worked upon and why and how is decided upon by all concerned in a participatory structure . ...

It is marvellous. If it is not the paradise - because probably there are no universities in paradise - it is at least a very attractive utopia.

2.2 The pessimist's forecast

I wonder whether the picture you painted for yourself at the beginning of this chapter of what your university will be like looks like this. Mine of Hamburg university and, beyond, of higher education in the Federal Republic of Germany, unfortunately does not. On the contrary. The German university will be pretty much so as it is now or even more traditional and old fashioned than at present. Teaching methods will still be the same as they have been since centuries, inspite of the invention of book printing, audiovisual media, and computers. Perhaps there are some monitors for teletext systems installed in information corners, but they will probably serve rather the teachers and consultants than the students. Books perhaps will be completely unattainable and fotocopies be even more dominating and abused than at present. But the lecture will not have been extinguished. Project oriented study is fading away already now and will perhaps, if at all, survive only in some small sheltered zones of

"soft" climate, as e. g. studies in social work or even education. Integration of theoretical and practical work or regularly phased changes between them? Just the same: the most prominent example of it and also an achievement of the just ending reform era, the so called "Einphasige Juristenausbildung" (integration of theoretical and practical training for the law professions) is just being liquidated (inspite of its successes) just like integrated, one-phase teacher's training had been abandoned. These reforms were given up to return to the traditional two-phase education for the law and teaching professions: Theoretical training first in the university, and practical training second on the job. Not unlikely that the same will happen to the internship year introduced into the medical curriculum a decade ago. Claims as by DENT (1983) - published in the Congress Preparatory Papers vol. II - that the only way to save our competence and welfare is to return to strictly disciplinary work and truly academic standards are to be heard throughout our country, too. Correspondingly, the Joint Federal - State Committees for the Reform of Curricula in Higher Education, which have been installed in the late seventies following the passage of the federal "Universities Organization Act", will probably have finished their work shortly before the year 2000. The committees leave or will leave very little space in their recommendations, if at all, for say social or political orientation and/or philosophical or ethical reflection in the training (not to think of education!) of our future academics. What there has been conceded of participation of learners in the decisions about them and their institution, due to the "Universities Organization Act", has already to be defended by its former critics against a conservative rollback. The idea of a comprehensive higher education system called "Gesamthochschule" with different levels of access and relatively high permeability has luckily been contained to a few peripheric places and is in danger even there.

Well, both pictures have in common that they do not frighten us with a future society getting along without educators. But besides that: the contrast between them should make us thinking. The probable conservative trend cannot just be jumped over by our sympathy with the optimistic vision - even if we accept it to be meant as a "creative forecast", intended to stimulate practical

actions in the right direction (cf. FRAGNIERE 1976, p. VII and 65). It is much too obvious that it shows striking similarities to the core of ideas, postulates and claims which the progressive education movement (or "Reformpädagogische Bewegung") has tried to bring forward - and this since the beginning of this century without a breakthrough. This experience taken seriously just forbids to repeat such hopes and claims before the reasons have been studied and understood why they have never been widely realised. Or: you cannot win the future you wish without understanding and, perhaps, battling the present structures which block it.

3. Barriers against change in teaching and learning

3.1 "Change" and "reform"

First a little remark with regard to our usage of terms. Of course we have "changes" in teaching and learning all the time, in terms of continous more or less slight adaptions and modifications: new theories, results and methods of research are included in the content, and teaching methods may embrace more group work and/or student tutorials, less lectures and less student papers ("Referate") in seminars, new technical tools now and then as e. g. overhead projectors and monitors; in the behaviour of teachers and students towards each other perhaps you find e. g. a less formal or "less authoritarian" style. On this level fortunately quite a lot of "changes" go without being noticed or publicly acknowledged. But with regard to the challenges of the future mentioned at the beginning of this paper, the term "changes" here is used to indicate a more fundamental reform of teaching and learning: in the whole climate (say for future orientation or an "anticipatory" attitude), in the decision structure (say "participation of those concerned inside and outside academia"), in the form of the teaching-learning-process (say project-oriented interdisciplinary work as the conceptual and organisational frame or dominant form) and in the predominance of creative, anticipatory or simulatory methods. Now, what are the barriers to reforms like these?

BOTKIN et. al. (1980, pp. 84 ff.) discuss three factors:
- an underlying concept of learning as (singularly) adaption

- an abuse of power and thereby of human resources
- an inequality of opportunities for learning between man and woman, urban and rural areas, "North" and "South".

As they deal with the educational systems as a whole these are quite plausible approaches. Looking only from within the institutions of higher education I would like to point out some other factors.[1)]

3.2 The recruitment of people (students and teachers)

One source of change in this sense could be if new people, people from other social strata and with a different vocational background than traditionally would flow into the universities. With regard to students somehow something of this kind may have happened to the German universities through the years of expansion. Some of the characteristics of the present student generation as observed by their teachers are local and group orientation, predominant practical interests and a here-and-now-attitude may be due to the fact that a petit-bourgois culture could become more dominant in universities (cf. LIEBAU 1981). But it is unlikely that another qualitative leap of this kind in student recruitment will take place in the near future. At least blue collar workers will not be brought into the universities in relevant numbers.[2)]

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1) To my regret this analysis is very much constrained to the Federal Republic of Germany. Given the specific historical situation of each system of higher education it is impossible to cover more than one system here. The reader is kindly asked to examine the same factors with regard to his own country.

2) In the FRG cooperation of academics with blue collar workers, be it in research or in teaching, can be found in rare examples of cooperation with trade unions (cf. VEREIN...1980). Such impressive enterprises as the extramural/inner city programme in Detroit are not paralleled here; the nearest are university study programmes for senior citizens (Dortmund, Frankfurt).

Perhaps after what is called the "student mountain" will have sloped down, which is perhaps illusionarily expected for the early nineties the German universities will condescend to accept some adult students for continued or recurrent education, preferably graduates, but perhaps even students without "Abitur" in case of need - that's all. We still have to work with the social composition of the student body we presently know.

And with regard to the teachers? We know those who will be teaching by the year 2000: they are mostly teaching already now! The expansion also of the teaching staff (by a factor 4 since the early sixties) has produced a distorted age structure due to which a big body of now still rather young professors will move on together for the next 25 years. Only very small numbers of young people will come in during this period and they in turn will be thoroughly influenced through the established patterns of academic socialisation which we know (cf. HUBER 1974; PORTELE/HUBER 1983). Whoever wants the university to be changed would have to work with these colleagues and if possible change them: Their belief and value systems, their patterns of perceiving and thinking, their habits and vested interests, hidden wishes and anxieties.

3.3 The setting of studying

In one of the frame factors of studying there may come about a structural change the impact of which cannot yet be guessed at: the transition from being a student as a nearly full-time occupation to the part-time student as the rule. Four developments may coincide:

- that those who after having passed the "Abitur" did not get or wanted to get into the universities partly only postponed this decision later on will claim access without giving up completely a vocation or position they may have already achieved;

- that generally more adults are admitted or even invited to the universities for further education, again without their having

to give up their jobs;

- that for lack of grants even all the students of the "traditional" type will have to earn money besides their studies continuously (as is already the case for 85 % during vacations and for 40 % even during term);

- that as long as the labour market cannot absorb them, students in the same way just live on at or around the university in, as we say, a "grey zone".

I do not yet know enough so far about the Swedish experiences, after the 25 : 5 scheme has been implemented. The consequences may be far-reaching with regard to how teaching is organized, how people interact, what standards can be required and achieved and how much learning takes place outside the classroom. But whether this works in favour of anticipatory and participatory learning I do not dare to say; it could as well strengthen the character of a vocational college even more.

And with regard to another frame factor, the media of teaching and learning? To put it boldly: up to now, it seems, new media have only served to enrich the learning situation between teachers and students, not to radically change or even replace it. (This holds true for the time when book printing was invented, and still is true for programmed instruction and distance studies, which only form a complement to face-to-face situations).

Sure, working places in laboratories and libraries have been technically improved, fotocopying has tremendously enlarged the availability and dissemination of texts to everybody; computers and teletext systems may allow to draw even more upon huge information storages. But perhaps the impact of the teaching persons being the only ones to attest relevance may even increase with the amount of information available. And at least as long as university teachers will act as examiners - and I am shure they will defend this hall-mark of their profession - the teacher-centered learning situations, especially lecture and seminar or tutorial, will continue to be dominant.

3.4 The examination system

Indeed: another factor no less important either for change or for resistance to change is the examination system. LUHMANN/SCHORR (1979) and others in PARSONS' tradition - although I do not agree with the systems theory approach generally - are probably right when in their analysis they stress the selection function of educational institutions and warn idealistic educators not to neglect it. Anyhow, whatever modifications we have seen during the last decades: they have tended to lead to more rather than less regulations, to a higher degree of codification and standardization, to more control by the administration and more and more through the courts of law. As the importance of formal degrees and grades entitling to further training or jobs has always been increasing (vgl. PRAHL 1980), the juridical character of decisions in examinations will probably increase, too. The only sources of change I could imagine would spring from a development of the academic labour market wich would make employers look for other criteria when they are to choose between lots of applicants all having grade A ("sehr gut") and/or which would make students and graduates neglect degrees and grades altogether as they do not lead to anything in any case. There are indeed some symptoms of that kind to be observed at present.

3.5 The disciplines

If no new and major forces act upon the university from the outside, the old strong walls will withstand all progressive attacks as they did since a century: the disciplines, the true unshattered victors in all the reform battles. We have to ask ourselves: whence their strength?

The standard common explanation among frustrated reformers refers to trivially materialistic factors, most often the system of gratifications:

- that gratifications in academia are offered for achievements in research rather than in any other area of the academic job;

- that these gratifications (promotion, funds, social status) are distributed only according to criteria set up by the scientific community of the special disciplinary field concerned (no other instance being available for judging the scientific merit of a research or teaching project - besides the doubtable attention of mass media);

- that therefore the scientific community, oganized as it is along the lines of disciplines or subdisciplines, forms the primary group of reference.

If these explanations were true and complete, some deliberate moves in the distribution of rewards would do to motivate university people into project oriented teaching and interdisciplinary research. Apparently this, whenever tried, has not worked. Even some of those colleagues who have engaged themselves in such work in Germany, especially in some new universities like Bremen, Kassel, Oldenburg, are somehow on the retreat behind the shelters of disciplines.

We may find a psychological explanation for this: to work upon practical problems stretching out across the borders of any discipline and at the same time to keep up the standards of theoretical consistency, empirical proof and general transferability one has learnt in one's own discipline is just too demanding a task for the individual in the long run. It may lead to role conflict, uncertainty about one's own status as an expert, work overload and uncertainty about oneself altogether. The discipline, on the other side, is that effective tool to reduce the complexity of practical problems to be solved, to limit the task, to make the criteria for planning and success clear, the work calculable and more independent from political and social changes. Thus it allows for the more comfortable status as an expert of a clearly defined special field and for the excitement of intellectual challenge and work relieved from all practical care.

If even bold reformers after some years of cruising across the stormy sea of interdisciplinary and project work tend to sail back into the harbour of their discipline, on the side of the individuals this must be due to such psychological needs. It

meets, however, with what PARSONS/PLATT (1972) and other authors in that tradition define as the essential function of the societal subsystem of sciences: to produce stringently and exactly proven knowledge. Well, according to the beliefs invested in our whole scientific business: ultimately it is only in the frame of reference of a disciplinary, abstract and generally applicable theory that such an examination can take place - and not in the singular and locally mixed up circumstances of any practical problem. Sticking to disciplines then means to keep up the constitutive function of the subsystem of science and at the same time to preserve the societal role and status of the scientists as its guardians.

Just to add another sociological aspect: if that is the religion, the proselytes have to be trained or moreover socialised in the disciplines first, before they may dare to get to the borderlines or even occasionally across the borders. And indeed, it is just by finding the problems as the discipline defines them, by solving the tasks with the tools and rules the discipline gives at hand, and by judging or being judged by the criteria applied within the discipline that students learn from the first home work or contribution to a tutorial onwards what could be named the grammar of the discipline: they are building up the special habitus of the members of this subculture or language community (cf. SCHÜTTE 1981; PORTELE/HUBER 1983 and others referring to the concept of "habitus" of BOURDIEU 1979). BERNSTEIN (1977) has pointed out very clearly how neatly the taxonomy and sequence of contents and methods called "curriculum" is linked with the social structure: the hierarchy of positions and the career patterns of a discipline. With regard to our question it matters little that what he calls the "integrative code" that may exist to a higher degree in social or educational sciences or the humanities seems to be less obstructive to the above mentioned forms of anticipatory and participatory learning. As long as the graduates of these disciplines do not master and even boast not to master any part of the natural or engineering sciences and as long as these latter disciplines supposed to matter much more for the development of the society are not a bit touched by social science and practical or philosophical reflexion, both codes are not apt to bridge the "human gap". Or: as long as the codes of

the disciplines are not changed so as to better correspond to societal developments teaching and learning will not correspond to them either.

3.6 The socio-political context

I have been talking about the university as an educational institution and about the world of disciplines as if they were autonomous and that means: as if they could change or be changed independently.

But the educational system has only a "relative" autonomy making believe it were not the ruling classes which reproduce their power and privileges through the educational institutions while in fact the educational system serves just this function (cf. BOURDIEU/PASSERON 1971). Not to speak of dozens of authors working upon the political economy and the sociology of the educational system: within the still smaller literature on "futures of education" or "education for the future", BENGTSSON et al. (1975) have in a convincing manner drawn the lines between possible futures of education and possible future societies.

They build up four types of society:
(1) the "neo-industrial" state and
(2) the "social welfare" state,
both "hierarchical" (which one may quickly illustrate for oneself by thinking of Reaganism and of the social-democratic policy); and
(3) the "compulsory collective" and
(4) the "voluntary collective", both called "egalitarian", which are somehow similar to what is existing as "socialism" in Eastern Europe and to what may be visioned by radically democratic communists as their utopia.

What I and others foresee as the probable developments of higher education in the Federal Republic has been forecasted in a frightening pertinent way by the picture the authors give of the type of education within the "neo-industrial" state, while what I have collected in the beginning as the marks of anticipatory and

participatory learning which we wish is remarkably near to the type of education supposed to be possible in this fourth type of society. This one also goes together with a new distribution not only of goods but also of labour by sharing the attractive and the ugly jobs among all citizens or a rotation scheme between them as envisaged by e. g. VISALBERGHI (1973) or BAHRO (1977).

3.7 Conclusions I

However superficial this attempt of an analysis may be: the following preliminary conclusions can be drawn:

a) We must not hope for a new generation to come and to realize the changes which the present generation did not bring about. On the contrary we have to work with the colleagues who are already there. Staff development or similar endeavours are necessary: not so much introductory courses for new staff as rather permanent training for the others already there, and not only oriented to modification of individual teaching behaviour but also to organisational development.

b) We cannot hope to achieve a reform of the curricula of the disciplines altogether, as they are too narrowly connected with the whole social structure of their fields. Rather we must be content to find some "outlaws" among the people in the disciplines and some niches in their curricula.

c) Logically trivial, but practically difficult: Who wants to have participatory and anticipatory learning in the future and critical anticipation in his society at present? And if so, then also higher education has to further such insights, knowledge, abilities and attitudes as are required for political actions like demonstrations, strikes, blockades, fasting, passive resistance, etc., however controversial they may be (cf. e. g. BURO, 1982, esp. 128 ff.).

4. Learning for the future, if posssible: what does it mean?

Looking through the literature one is bound to get the impression that learning for the future most of all consists of and is achieved by certain methods, e. g. brainstorming, role-play, simulation games, all sorts of group work and group dynamics, and by the use of certain techniques of futurology research, e. g. Delphi method, scenario, computer simulation.

May be that learning for the future cannot be conceived without such techniques. But what are the aims and objectives?

Trying to answer this question we meet again - not surprisingly - quite familiar basic questions of our trade.

4.1 Ethics: Conform with or critical against dominating trends?

Much of the literature of futurology and about future education suggests as a matter of course that the developments in science and technology, in communication and traffic, in short in any field advance more and more rapidly, that this means progress and that the task of education is to make the learners of all ages fit to cope and to keep pace with it (take as an example TOFFLER 1971, cf. the critique of certain futurologies by BENGTSSON et al., 1975, pp. 12 ff.).

This attitude is directly opposed by another one, which radically questions the value of this rapid "progress". People of this attitude who think it necesssary to get out of this self-accelerating train and to say no to further unilimited growth will also as teachers try to create such a dispostion in the young people and to make them ready and able to realize it in new ways of living together, working, and consuming. In fact, not a small portion of students and graduates, those who somehow belong to the "green" or "alternative" subculture and form it, try to pursue such new ways. As they do not necessarily argue that society at large could take the same direction and as indeed not all of us could become shepherds again, somehow this seems to work only as a private solution.

Between just continuing with the race or individually getting out (which leaves the race going on) I think I have to plead for a third way: to slow down the speed of "progress" in any field so that it can be controlled by the citizens concerned in that field (workers or employees and their families, consumers, neighbours). To try an example: in research - and no less in technological development - this would mean that the results of any project must be communicated to the public concerned in this sense (not just to the scientific community in their journals) before new projects in the same line are financed and started. Alternative plans and the scientific and societal consequences of both must be anticipated and discussed before the decision is taken (cf. BOTKIN et al., 1980, pp. 79 f.). This would imply that issues for research pushed forward by the scientists themselves or by other groups with only particular interests but enough money must be confronted with needs to be articulated among the people concerned through their trade unions, through "Bürgerinitiativen" (citizen's initiatives) or through "Wetenschapswinkel" (arts and sciences corners): the trip to the moon versus an elaborated bicycle.

As true scientists are so fascinated by the intellectual challenges of their research and so eager to proceed rapidly with this, their own proper work, as technological progress would perhaps - we do not really know without trying - be slowed down and become more expensive, as the national industries would fear to fall behind in the global competition with others,[3] as the scientific examination of truth would be in danger to be replaced by local or group consensus ("communicative validation"): to propose such a time-consuming communication with laymen is perhaps no less illusionary as the wish to break up the disciplines in favour of interdisciplinarity. But this again only shows that ethical questions are involved and that it is a political task which has to

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3) Trends seem to go just into the opposite direction: to enhance the progress of research by concentrating the most able scientists in "research camps" or "think tanks".

be solved but can be started by each of us in his research. In the Club of Rome-Report equal importance is placed upon anticipation and participation, but I am pleading for a strong priority for participation as the means to change sciences and politics - and anticipation as "only" one of the dimensions of learning and discussion which is to be applied within participatory processes. To put it otherwise: there is no use of creating a new sort of experts: the specialists of anticipation (futurology) who are not obliged through procedures of particiption to argue for broad approval, to learn about the concern of others, to respect the consequences which events to come will have for the masses, etc.

4.2 Aims: formal training of abilities or acquisition of substantial knowledge?

The second question refers to the old topic of didactic discussions: whether a general form of thinking or a certain knowledge of a specific subject ("formale" oder "substantielle Bildung") is the aim of education. And if the latter: what content is meant by future-oriented teaching and learning? Again: if people are under the spell of rapid change as following its own dynamics they tend to call for "to learn how to learn": the learners must acquire the formal ability to store, retrieve and apply ever new information, to be re-trained, to adapt individually to new circumstances. The "throw-away-society" thus finds its correspondent in a "throw-away-identity". Also the well-known principles of lifelong learning and permanent re-education, of creativity and flexibility at any price, of methods of anticipation as such do point in this direction if and so far as the content is not defined and discussed, what all this learning is to be about, and as it is not taken into account how human beings are affected who are called upon to digest all these changes.

The latter consideration is the starting point for the opposite attitude by which what the individuals feel, think, hope, and suffer, the socalled subjective concern (in German: "Betroffenheit") is raised to the overall measure and criterion of learning: learning can and will take place only if and as far as subjective concern, whether actual or potential and therefore to

be evoked, raises the desire for new insights or techniques without which a present problem cannot be solved. It is not in advance defined or reasoned about which problems this will be. If and when personal concern is eliminated, also learning comes to an end. The danger that this idea deteriorates to a purely local (instead of cosmopolitan) and individual (instead of societal) orientation exists.

I think that neither principle is sufficient. It is obvious that a more than just egoistic concern and motivation to learn about the future and a deliberate learning for the future can only rise if at least some information about possible future developments not only in our country but also in the world will be acquired and visions about possible alternatives are being imagined. Things are too complicated, too interdependent than that we could understand them and participate without thorough knowledge. More of the precious time for learning in our institutions therefore must be made available for issues like the following:

- the global nutrition problem between famine there, affluence and waste of food here,

- the world monetary system between exceeding indebtedness there and financial imperalism here,

- the worldwide arms race and its implications for international security, domestic policy, and economics,

- conceivable new technologies and their eventual impact upon labour, use of energy, communication,

- cultural reactions likely to arise e. g. to electronic communication media; dangers e. g. for the human abilities to play, to be creative, to communicate with one another.

Well, to anticipate such developments and to understand the interrelations between them and to conceive of alternatives theroretically is one necessary dimension of the future oriented curriculum in terms of content. But this is not at the same time sufficient to shape the future practically; a second dimension has to

be to acquire and to practice strategies and methods suitable to pursue the developments supposed to be right and to carry them through politically. This requires grosso modo the same abilities as necessary for participation (see item 3.7 c) above): abilities to communicate and to cooperate, to plan and to organize work with others, patience, empathy, tolerance, loyalty to one's group or institution, or, to put it in the terms of the Club of Rome-Report (cf. BOTKIN et al. 1980, pp. 65 ff.): autonomy and integration.

4.3 Organization: part of the curriculum of the disciplines or core of a general education programme beyond them?

Thinking of such a curriculum in higher education you will immediately face a third of these old fundamental questions: Is it to be a part of and within the special curriculum of each discipline, oriented to the eventual professional practice of the specialists who graduate in this discipline? Or should it be the core of a transdisciplinary curriculum of general studies oriented to the eventual social and political practice of academics as citizens?

In theory and in our whishes the alternative is absurd and the answer would never be exclusive: everything speaks for developing curricula of the disciplines which at last include global and future problems belonging to their proper domain in due breadth and depth, say the world monetary system and its political consequences in the studies of economics, exploitation and production of energy and its environmental implications in the natural and engineering sciences, and so on. Nothing on the other side speaks against improving general education with regard to these problems for students quite independently from the disciplines they are studying (cf. item 3.5 above) - in order to better prepare them for the still important role which academics play in public opinion and social and political activities beyond their special field.[4)]

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4) I do not speak of training people who are already decided to work in the Third World or of training all people as if they were to work there ... .

In practice, however, neither of these ways works because it will not be followed.

With regard to the first one: through the last 15 years since the student movement with its similar ideas and claims or even since the war we have not succeeded to convince the dominating scientific communities of the disciplines of that theory of cognition which says that the subjects they are dealing with and the form in which knowledge is found, produced, and transmitted are directly related to the societal context and its problems and that to elaborate this relationship is a genuine task for research, teaching and learning of the discipline itself. Project oriented studies which tackled this task never got a firm footing, at least not in the natural sciences. For "social" or even "philosophical" aspects of the disciplines, another of these claims, two or perhaps four hours per week of the term at most have been grudgingly conceded out of a total of 160 or more hours and located at the fringes of the curriculum. That's all ...

And the second way? From the view point of traditional ideology of the (German) university, articulated once more only two years ago by no less a body than the German Rectors Conference, any political education beyond the scientific training is not the task of the university. And even where a "studium generale" is being offered - if it is facultative, as it was in the Federal Republic during the fifties, it is hard to keep the students' attendance in spite of so many other things they find to do, and if it is obligatory, as the marxist-leninist-courses in the German Democratic Republic, it is attended but without interest. Maybe you could do both things better and make them more relevant than they were or are done, but it rather seems to be a structural problem.

My own personal conclusion from this dilemma: there is, at least presently, no way to an institutional and so far official curriculum of future oriented learning neither within the disciplines nor beyond them. There are only various ways of non-institutional informal attempts dependent on the insight and willingness of individuals, teachers or students, to do something about it.

One or the other university teacher may be foreseeing and courageous enough to make an extensive use of the freedom of decision he has and include future developments as complex as they are in the special subject he is teaching or to start an additional seminar or working group for those of his students who are interested. Other teachers may offer to contribute with their competence to interdisciplinary courses run by a group of scholars voluntarily formed for that purpose. Students may gather for learning or small project groups on problems related to our future, maybe totally independent from and outside of the university, as they already do, maybe inside, looking for professors willing to cooperate with them, as they might perhaps try to do in the future.

To formulate these thoughts implies two things:

(1) In contrast to the claims for a new type of science of an integrated code 15 years ago and due to some degree of resignation through them this means to bow to a separation between the modus of operation of science and teaching as it is, and the activities we find interesting if not necessary politically and which therefore we do outside the proper job of teaching and learning in our spare time - hopefully at least together. Apparently there are students who already act in this almost schizophrenic manner both because the disciplines do not care and because professional training for nothing but unemployment does not make sense.

(2) We are going to behave in the university just in analogy to what happens in society generally: the formal, the constitutional ways of democratic delegation of power, of public decision making and civil administration seem to be blocked, petrified, overregulated, much too inflexible; therefore the innovative elements try to find their way elsewhere: in informal groups, private networks, often changing campaigns, ad-hoc-initiatives, thus, if they cannnot influence the governmental policy so at last to make public opinion sensitive and, sometimes, to realize a bit of the necessary solutions within their own reach.

4.4 Conclusions II

Beyond what has been said at the end of the first part about political consequences to be drawn: what we can and should do in higher education is, to sum it up:

(1) To find and to bring together colleagues from the various disciplines in our own university who are ready to deal with global problems and future developments in their own teaching, presumably in the form of concrete projects. This way may well go together with some sort of staff development and may lead to forming a permanent working group for that purpose.

(2) To work for building up a new non-compulsory "studium generale futuri temporis" which is to cover some knowledge about possible developments, methods to anticipate the consequences and to think in interdependencies, and discussions of ethics and political actions.

(3) To support all links or interactions between the universities and people outside, citizens' groups, local cooperatives, etc. which can be established by means of extramural work, engagement in learning outside or by taking up issues collected through science shops or giving them to student projects. That will, as I said, not replace the traditional type of scientific work, but perhaps serve as a correcting factor, and it may perhaps more and more involve the universities in the developmental task for their own or other societies.

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