1 INTRODUCTION: Warning Voices

Let me start my exposition with a quotation by one of the leading American experts on education, Roger C. Schank, the director of the renowned INSTITUTE FOR THE LEARNING SCIENCES at Northwestern University (Chicago):

"Today's schools are a mess. They are organized around yesterday's ideas, yesterday's needs, and yesterday's resources (and they were not even doing very well yesterday). Consider the most common classroom approach: One teacher standing in front of 30 children trying to get each one to be at the same place at the same time. This approach has the advantage of being relatively inexpensive, but it flies in the face of everything scientists have discovered about children's natural learning mechanisms, which are primarily experimentation and reflection – in other words, learning by doing. Consider also the concept of the curriculum: that there is a particular body of knowledge everyone should know. This idea may comfort those who are concerned that our children know the "right stuff". Children, however, learn facts about the world because they feel they need to know them, often because these facts will help them do something they want to do. What is the right stuff for one may be the wrong or irrelevant stuff for another." (Engines for Education 1)

There have been more and more experts in the last decades who like Schank have demanded an urgent reconsideration of our educational concepts and a radical transformation of our schools world-wide.

But unfortunately these issues have mainly been discussed by educators, psychologists and other experts in the field of education. The majority of the people has not worried about the fundamental questions and there have been only complaints when there were not enough teachers, when there was no school or when some spectacular cases of school riots or violence appeared in the press. Especially in Germany each effort of school reform has been viewed very critically by the political opponent and has often been rejected out of the nostalgic ideas of the 'school of the good ol' days'.

But times seem to be changing. More and more the media have published the results of international school evaluation programs which point to the shortcomings of today's education. Above all the results of the recent Program of International Student Assessment (Commonly known as PISA) which was carried out in 30 countries by the OECD (Organisation for the Economic Cooperation and Development) has drawn the attention of a broader public. Especially in Germany which has claimed to have one of the best educational

systems world-wide there has been a tremendous shock which found its expression in the headline of the leading German magazine 'Der Spiegel': Are German students all dumb?

What had happened?

Unlike most other tests PISA has not stressed so much the facts you learn at school but the capacity to use your knowledge with the solution of real-life problems. One main test content was the reading literacy: How do students receive and make use of the information which they find in the texts which they come across daily?

In a similar way PISA also tested the students' mathematical and scientific reasoning and their skills at finding new and creative solutions.

For many countries and especially for Germany the results of the PISA-evaluation are shocking and disappointing because they prove that a majority of the students is not able to make use of the knowledge they accumulate during their school-years. This raises the question of the relevance and real-life orientation of our school curricula..

I think, at the beginning of the 21st century we must again ask the fundamental questions about the goals of our schools and our education. And perhaps we must also look back at some of the important educators and reformers of the last century such as John Dewey, Celestine Freinet, Maria Montessori and John Holt , whose ideas are as vivid today as they were decades ago. Seneca wrote 2000 years ago in his 'Epistulae', that we learn for life and not for school- NON SCHOLAE SED VITAE -. If we take this demand seriously we must admit that our schools have failed to a great extent.

Most of the schools, we encounter everywhere today, their organisations, their curricula, their teaching methods and their teachers are in spite of some selective modernisations still a result of the 19th century. The prevailing model sometimes has been called the 'factory-model' of school: A large quantity of persons uniformly has to complete a task at the same place, at the same time which has been given to them by someone else. There is no room for creativity and self-determination. But we don't live any more in the industrial age. Our world is not the world of our parents and our children's world is different from our own.

If we want to find a new way for our schools we must have a closer look at our world today.

How does this world differ from the world some decades ago? Which are the challenges that we and our children must face?

A Changing World

What do we know today?

- **The Explosion of Knowledge**
- **Technological and Technical Progress**

How do we live today?

- **The Changing Family**
- **The Changing World of Employment**
- **The Changing Leisure Time**

Where do we live today?

- **Living at Different Places**
- **Living in Virtual Surroundings**
- **Living in the 'One World'**

What do we believe today ?

- **The Crisis of the Natural Sciences**
- **Religions and Ideologies**
- **Fundamentalism**

How do we learn today?

- **School's Lost Monopoly on Knowledge**
- **Autonomous and Free Access to Information**

2 A CHANGING WORLD

2.1 What do we know today?

One outstanding feature of our modern time is the explosion of knowledge. Every 2 to 3 years the entire knowledge of humanity doubles – especially if we consider the scientific progress. Much of what we learned, believed or seemed to know has become obsolete or must be complemented.

Each day we learn about new scientific concepts that go far beyond our imagination: Black holes, a world of multiple dimensions where we exist several times, time running backwards, a speed that is faster than the speed of light. The more we try to grasp these ideas the more we are aware of the limits of our knowledge and power of imagination and we remember the Socratic sentence: I know that I know nothing.

But the technological and technical progress has also invaded our daily lives and we must often admit our limits. Programming the new digital recorder, coping with our new camera, using the board computer of our new car – everywhere we meet new challenges. Some years ago a mechanic could repair a car. Today he is only an expert for some special brand. And the heart surgeon is perhaps only an expert for specific heart diseases.

The more we learn, the more we know, the more we find out that there still is a lot we should know. But what may cause us trouble is sometimes easy for our children. Some generations ago the whole family waited for the grandfather to come back from work in the evening to fix the faucet. Today we wait for our children to come back from school to help us with the new software for our PC.

And there is no end in sight for this breath-taking development. Genetics, nanotechnology, nuclear fusion - there are many areas where we can expect new trends and inventions that today seem a miracle.

2.2 How do we live today?

There have been dramatic changes in the way we live together as well. Sociologists have commented on the changing family structures in detail. The traditional male-female roles now have changed in many countries. More and more both parents are working and there is less time for a common family life. Especially in the industrial nations the life-long marital

relation is more and more replaced by temporary, changing partnerships, often without any children. And even homosexual partnerships which were prosecuted by law only some decades ago have now been legally sanctioned in some countries. Other sociological changes are apparent: The long-lasting fight for the rights of minorities has shown first positive results and more and more women have taken influential posts in governments and business companies.

And like our relationships change, the world of employment also changes dramatically from day to day. A recent study in Germany counted more than 300 professional careers that were unknown only ten years ago.

Instead of driving to the office every day more and more employees today work at home and sometimes contact their colleagues in other continents via video-conferencing and the Internet. And only recently an operation at a hospital was carried out by a robot which was controlled by a surgeon who was watching everything on a screen several thousand miles away. The working –time and the working-place become flexible. Creative work often occurs in teams of think-tanks. Work at the assembly-line which remains a symbol for the addition of the work of several workers working independently from each other is being replaced by more integrated work carried out by flexible working teams.

 And if we take up a profession today, we can almost be sure that we will have to follow a second or third career in the decades to come.

Like work leisure has undergone tremendous changes.

New industries have developed that look after people's needs in their free time. Above all computers and the internet have changed our world to a degree that many contemporaries are not even aware of.

Books are being replaced by other media and although people read more than they ever did before reading habits have changed dramatically: shorter informative texts and E-Mail messages have substituted lengthy novels and handwritten letters on a large scale.

And paradoxically the abundance of possible leisure activities has lead to an unimaginable degree of 'ennui' among many young people.

2.3.   Where do we live today?

For our great-grandparents the visit to the nearest town or city was a major and unforgettable experience. Today in our mobile societies we change our places of residence continually. And in our vacations we visit exotic countries that we read about in the books of our youth.

Within seconds we connect via internet to far distant places and go on a virtual trip that leads us from Germany to Japan to Cameroon and the U.S. in the matter of an instant. And while we are sitting at our PC at home we have access to the world's biggest library. A computer, a satellite dish or a telephone line are the only keys that open our door to the virtual globe, no matter if we are sitting in our office in New York City or beside our hut in the rain forest of Ecuador.

Sure – both miracles and dangers are at hand and for some people life in virtual worlds sometimes replaces life in our reality.

More than ever before our daily life is subject to events which occur in far-distant countries and we understand that globalisation once and for all means sharing the problems of others that we never have met or will meet:

If today the EU decides to raise the import taxes for coffee tomorrow the effect will be seen in Cameroonian plantations. If today large parts of the rain forest are cut down, tomorrow there will be climatic changes world-wide.

We have learned that today we all depend on one another and we see the dangers, but also the advantages and the responsibility of living in the "One World".

2.4.   What do we believe today?

Our scientific, mechanistic so-called Cartesian concept of the world has been questioned more and more by modern scientists such as Einstein and Heisenberg and we understand that there is no certainty in what we know or as the great philosopher Sir Karl Popper put it: There can never be a final verification of what we think and believe. What is true? What is right? What is wrong? History has shown us that every now and then mankind has to dump all its convictions on the huge garbage heap of time.

After the downfall of the socialist ideologies and the crisis of the churches we are experiencing a new search for truth and stability. In a world of ever-changing ideas and judgments people are craving for new dogmas and simple explanations. Religious fundamentalism and political dictatorship are on their rise. This has led to strong clashes of

opinions and it is sometimes difficult to uphold the ideal of tolerance with people that are intolerant and fanatics. Suddenly, in a multicultural and secular world old nationalisms are in vogue again and new doctrines of salvation gain willing disciples everywhere.

2.5 How do we learn today?

If we compare the function of today's schools with the function of schools some decades ago we are aware of a dramatic change: **Schools have lost their monopoly on knowledge**

More and more people acquire knowledge before, outside and after school. Sure – we have always learned important things outside school. We learned to walk and talk without ever attending courses for walking and talking. We have learned foreign languages just by living in a foreign country, communicating with strangers day after day. We have learned many things or I dare say most of the things we need in our life through living and often quite unconsciously. But till now it has always been the privilege of schools to tell us what we really should know and what we perhaps might need in our later lives. And just for that billions of dollars have been spent worldwide and armies of professionals, called teachers, have been hired to cram into our heads what some people thought worth learning and what would make us educated. But what went without saying in the past has become questionable today. Everywhere we can acquire knowledge today: On television and CD-ROMs, on the internet or round the corner at a modern academy. And quite often these new media of information are more interesting, entertaining and effective. Without the help of a professional teacher today millions of students outside schools have autonomous access to whatever information they like, wherever and whenever they want to. There are hundreds of experts waiting for them who do not belong to the "Institution" and sometimes the students become the experts themselves.

Our world is different from the world of our parents, as I have shown

But mostly our children go to schools which try to cope with our world and tomorrow's world by means of the past. They are prepared for a world outside an ivory tower which only exists on paper.

Let's try to find some answers to the two main questions

What should be taught and How should it be taught?

3 WHAT SHOULD BE TAUGHT?

3.1 Curricula

Each country, each school has got its curriculum. And even in countries where there exist no national curricula you have the 'hidden curricula': the final tests, the placement test, the entrance exams for further education or simply the school books that are commonly used.

But who decides on the content of these curricula, who decides which subject matters should be taught, how much a student should know at a specific age?
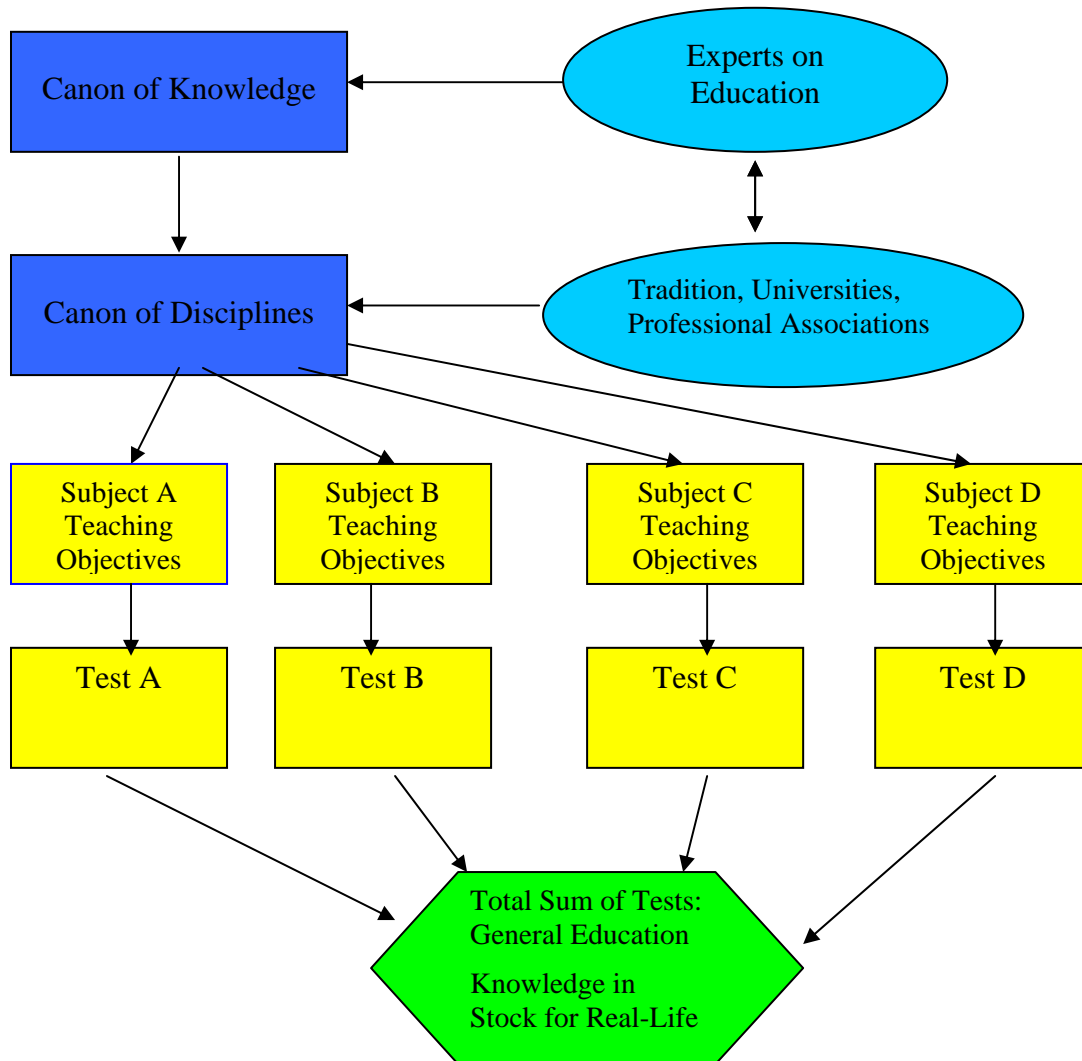
Till recently in most countries it has been the structure of the universities and the academic disciplines being taught at the universities that have had the most impact on school curricula. The utmost though implicit goal for students was still the academic scholar and universal genius of the Renaissance although it had become quickly clear that they all could become only very narrow specialists or just ordinary citizens without any academic consecration.

In the last five years there has been a significant change in curriculum planning in some countries which I sometimes like to call a change of Copernican dimensions.

Instead of a structure which is being dictated by the structure of academic disciplines some curricula try to establish a structure which is modelled on real-life and leaves a more serving part to the academic disciplines. Let me demonstrate this development with two diagrams:

Traditional Curricula

```
Canon of Knowledge ◄──────── Experts on Education
        │                          ▲
        ▼                          │
        │                          ▼
Canon of Disciplines ◄──────── Tradition, Universities,
        │                       Professional Associations
        │
   ┌────┼────────┬────────────┬──────────────┐
   ▼    ▼        ▼            ▼               ▼

Subject A    Subject B    Subject C      Subject D
Teaching     Teaching     Teaching       Teaching
Objectives   Objectives   Objectives     Objectives
   │            │            │               │
   ▼            ▼            ▼               ▼
Test A       Test B       Test C         Test D
   │            │            │               │
   └──────┐     └──────┐  ┌──┘         ┌─────┘
          ▼            ▼  ▼            ▼

        Total Sum of Tests:
        General Education

        Knowledge in
        Stock for Real-Life
```

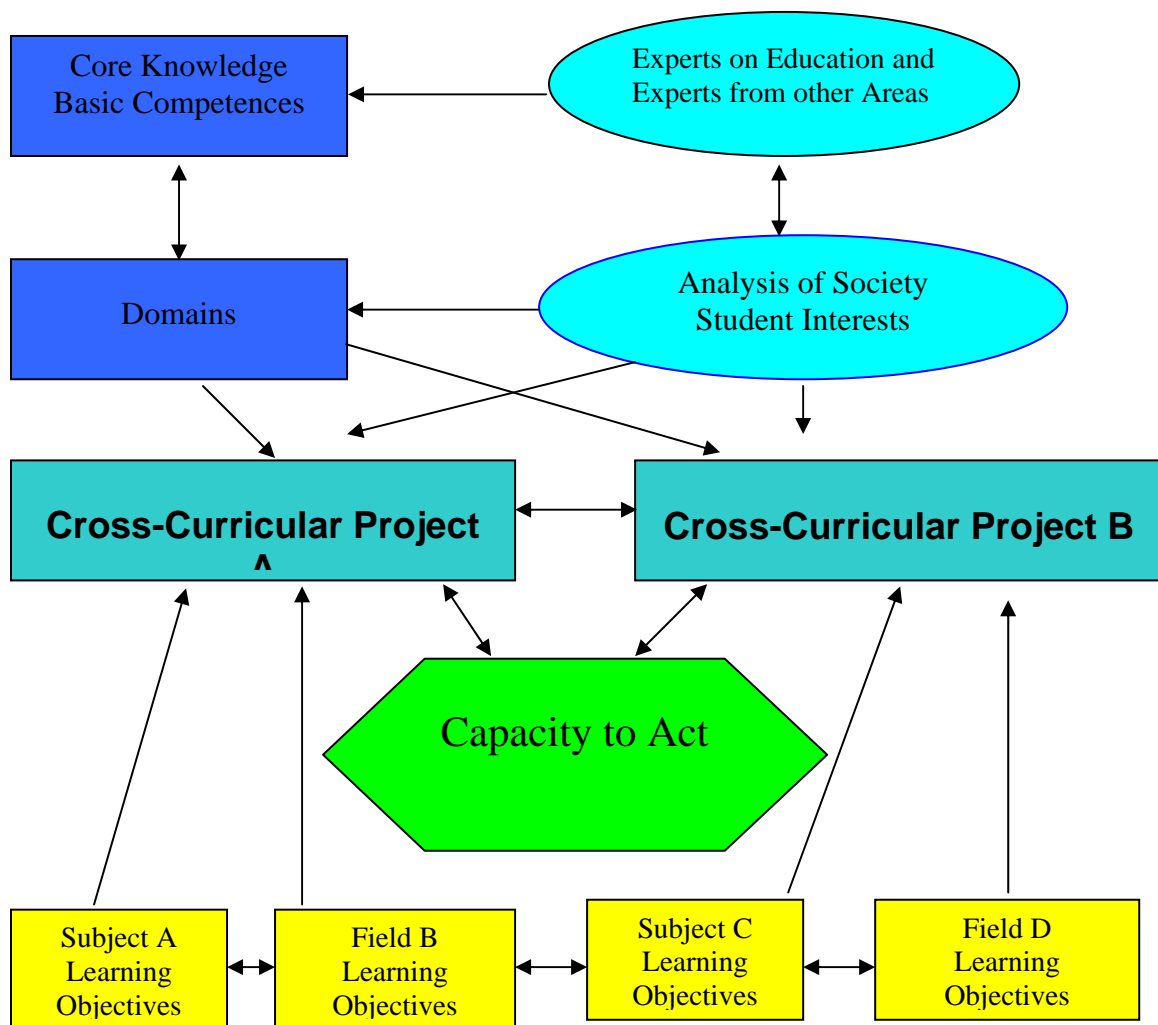### *3.1.1   Traditional Curricula*

Traditionally the curricula of the different disciplines have been written by experts of the corresponding disciplines (from school and university). There is no or hardly any interrelation as to the objectives of the different disciplines. Equally the tests in the different subjects are independent and only test the knowledge and the skills which have been acquired in the corresponding subject.

The canon of knowledge, the prevailing subjects and the teaching objectives are part of the educational tradition. And sometimes powerful professional associations of teachers insist on the importance of certain subjects and exams. (which e.g. has always been the case in Germany with the status of the ancient languages Latin and Greek). Quite often the curricula of distant countries hold lots of similarities – and there seems to be a common agreement that there exists a certain amount of knowledge that people everywhere at all times should possess.

In the European tradition the humanities and the importance of historical and literary facts have played an important role for centuries.

In many countries the student who leaves school is judged according to the average result in all the different tests and so it may happen that the exam grade in mathematics is decisive if someone wants to study medicine. With the knowledge the student has in stock when leaving school he is supposed to be prepared for all possible careers and the real –life problems he may encounter afterwards.

Future Curricula

Core Knowledge Basic Competences

Experts on Education and Experts from other Areas

Domains

Analysis of Society Student Interests

Cross-Curricular Project A

Cross-Curricular Project B

Capacity to Act

Subject A Learning Objectives

Field B Learning Objectives

Subject C Learning Objectives

Field D Learning Objectives

3.1.2   Future Curricula

A new approach in curriculum development is based on the cooperation of experts not only from the educational disciplines but from all parts of the society. These experts have the task to analyse the needs of the specific society and to draw from their own in-school and after-school experiences. There should always be the possibility for the most important participants in school-life, the students themselves, to exert influence on school curricula and school topics. The resulting curriculum will be a

- continuous compromise between the needs of the individual and the requirements of a specific society at a specific time.

- the identification of important domains, areas of living and learning,   and

- the agreement on a catalogue of competences which are important for coping with life

School subjects are not being taught for their own sake but they contribute to the more extensive aim to endow the students with the knowledge, the concepts and the skills that help him to lead his life. Therefore each subject must be examined as to its contribution to the greater aim of enhancing the student's capacity to act.

This must be done in integrated projects in certain domains where different subjects and fields take part and give the student the possibility to see a problem or a situation from different points of view and ask different questions.

The main goal is no longer the acquisition of an established number of facts and skills, but the overall capacity to act in real-life situations.

The result is no longer an isolated test but a product or an action which is presented and made public by one or more students and assessed not only by one teacher but by other students, other teachers, parents, the students themselves and sometimes even persons outside school.

Here are some examples for possible domains which lend themselves to cross-curricular activities (Taken from a recent curriculum of English as a foreign language):

DOMAINS

Daily Life

Nature

Technology

The Present and the Past

The Present and the Future

We and the Others

Art

3.2. Domains

Within these domains the existing disciplines can agree on integrated projects which are relevant to the student's life:

Let's design a new school

Let's present our town

Let's compare two countries   etc.

It can easily be seen that the existing subjects can be part of the projects.

The work in projects will form an important part of school life. And the so-called basics can still be taught in the traditional form and in traditional courses

Sure- reading, writing, calculating must form the basis. But why should a student not learn reading with the books he wants to read and writing with the activities he wants to follow?

I am quite aware of the fact that each school-reform sets out from concepts of its own and that a new 'progressive' canonization sometimes just replaces the old canon. Even the international school evaluation programs such as PISA are based on certain assumptions of what a good education should look like and we need not agree with them at all costs.

Therefore we must create flexible curricula that form a frame for what can be done at school according to the surroundings and the time. There should be a continuous revision, modification and completion instead of a curriculum which lasts for the next century.

And perhaps we should say goodbye to the notion that all students should learn the same things and welcome different competing concepts even in one country.

3.3 Core Knowledge

It is quite obvious that this approach to curriculum work can finally lead to the disappearance of old subjects and subject-contents, to the introduction of new fields of interest and to a new definition of what should be the essential knowledge and what should not be taught and learned at schools. This means that the resistance of professional associations is almost certain.

The question about the essential knowledge, skills etc. leads us on dangerous terrain. If you ask people what should be the content of education at schools they almost certainly agree that the students should learn what is essential or what should be known by everybody. But if you probe further you will find that is almost impossible to a common agreement. In many cases

the interrogated persons quite naturally suggested that their knowledge should be taken as the surveyor's pole to decide what is the essential knowledge.

It is high time we asked some unpopular questions and proceeded to slaughter some sacred cows.

What do I have to know about the German poet Goethe? Is someone uneducated that perhaps only knows the name? A question that seems almost blasphemous to the experts on language and literature. But what will the mathematician say if I question the importance of graphs, binomial formulas or even fractions? A professor of didactics and mathematician himself dared to question the contents of school math in Germany some years ago and argued that most people could well live happy lives with the mathematical knowledge of their first six school-years. He was fiercely attacked by his colleagues and accused of fouling his own nest.

I think we all must free ourselves from our biased notions of how an educated person should be and rather ask the question how someone copes with life and treats his fellowmen.

One year ago I gave a test to a group government officials from a ministry of culture who were in charge of the different subjects being taught at our schools. The test consisted of thirty questions from different school subjects that the 7th graders of a German school had been asked in tests and homework tasks within one month. Not one of the experts was able to answer more than half the questions. And not only the questions from alien subjects caused a problem but there were also questions from their proper fields which the experts could not answer and considered to be irrelevant.

The old students' question : "What is this good for?" must be taken seriously and the question "Will this be on the test?" should never be asked again.

If you look at our schools today you often get the impression that something is being taught only because there will be a test on it. "Memorize it for the test, and forget it afterwards, because luckily you will never be asked it again!" This is the motto of schools and learning world-wide. Certification and credentialing has become the purpose of our schools. We must free them of this burden and leave them to their main purpose, which should be learning

But we still do not know what our students should learn. Should there not exist a common basis of knowledge for all of them?

I think it is an illusion to expect this common basis even from the people who have attended the same school. Far more the common basis is being formed by living together in the same circumstances, in similar surroundings, sharing the same real-life experiences and dealing with the same domains of life.

We must face the truth that the contents of school subjects in the end are interchangeable to a great degree if it is really the aim of our schools to enable the students to act.

Instead of amassing a large amount of easy-to- be –forgotten facts and details school must concentrate on few examples to make the students aware of certain notions of the world they live in. Howard Gardner, the psychologist and educator from Harvard has tried in his last book 'The Disciplined Mind' to reduce the message of schools to three items: What means right and wrong? What is beautiful and what is ugly? And what is good and what is bad? Although the simplicity of this concept has some appeal, to my taste it still runs the risk to be subject to manipulation by the ones who know what is beautiful, right and good and do not want to show the cultural and historical dependency of these terms. It is fascinating, however, to extend his concept further: Chaos and Order, Infinity and Limitation, Change and Immobility… It is surely worthwhile to develop an integrated school curriculum that is based on the teaching and learning of the inherent principles that govern the world.

I would like to follow a more pragmatic approach and ask the question:

Which are the key competences that the students need today and in the near future to cope with life?

Key Competences

Flexibility and Creativity

Linked-up Thinking

Dealing with Information

Problem-Solving Strategies

Autonomous Learning

Dealing with New Technologies

Emotional Intelligence

3.4   Key Competences

3.4.1   Flexibility and Creativity

The most distinguishing feature of our world today is rapid change. The explosion of knowledge, the continuous succession of new inventions and the daily real-time experience of events that take place somewhere on our globe have made some historians talk of the acceleration of history.

This rapid change creates insecurity and even fear. Therefore it is of vital importance for our generation and for the generations to come to deal and cope with change.

More than ever before we must be prepared for the unforeseen. We must be open towards the unusual, we must be willing to accept the inconceivable and we must be capable of evaluating new trends and predict future events.

This mental flexibility can hardly be achieved through rigid curricula and routine exams. It comes from open-mindedness and a creative spirit.

Little children are creative and investigative. But many of them lose their creativity and spontaneity at school. Why? Divergent behavior is often punished. The fear of committing mistakes and of receiving bad grades becomes more and more dominant in the kids' lives.

Teachers normally want to have the right answers and not possible answers. The still wide-spread so- called objective tests that have been criticised since the 1970s by educators and psychologists alike express this attitude and keep on existing in spite of all objections. (Perhaps the rather simple way of correcting these exams has been the main reason for their success.)

The schools of tomorrow must not only tolerate but encourage divergent thinking. It must be integrated in daily school life. The right to commit mistakes must be a basic right for students everywhere. They must be encouraged to take risks and leave the beaten tracks. The fear of failure is the cause of the reluctance to follow new directions. Our world is in urgent need of intellectual flexibility and surprising solutions and schools must pave the way for it.

3.4.2   Linked-up Thinking

Another important feature of our world today is its network-structure. Today we know, as I have shown, that there is a global interdependency of many factors that make up our lives:

Climate, economy, politics, culture etc. We cannot grasp what is happening in one part of the world without looking at the whole picture.

And even in our daily lives we see that events interrelate and depend on one another. There does not exist one single problem which can only be seen from one perspective, according to the limited aspects of one discipline.

The Internet serves as a symbol for this new way of thinking. When we do research on the internet we do not normally follow a single thread, we do not proceed linearly but move from one link to the other, from one level to another. There have even been written novels now which consist of texts, hypertexts and hyper-hypertexts.

And the new findings of neurophysiology show us that the structure and functioning of our brains exactly follow the same patterns and principles.

A school where the Math-teacher shuns the Historian and the Music teacher does not want to know anything of Biology is a past phenomenon and a university where the different faculties build high walls around them against the intruders who speak of integrated curricula and cross-curricular project work is an anachronism. We must all understand that what we do and like is sometimes not more important than what others cherish.

The teacher of the future can no longer be only an expert in his field but he must be interested in what is going on in the world. He must be able to transgress the limits of his discipline and capable of holistic thinking. He must be interested in his students' approach to life and willing to learn continually, perhaps even from them.

3.4.3 Dealing with information

For the first time in history we can hardly complain about a lack of information. The internet provides us with abundant information, trash alongside first-class material. Therefore the capacity of finding information, choosing the appropriate piece of information and deciding on its importance and reliability, using this information for our purposes and spreading it again have become decisive competences for us today.

Here the 'reading literacy' that was stressed in the PISA-evaluation and the communicative competences in our mother tongue and perhaps some other foreign languages play an important part. The shocking results of the PISA-evaluation have consequences in all areas. If students are not able to read schedules and diagrams they might hardly understand scientific or historical texts or even analyse and process them.

Surely this shortcoming has different reasons. Research has shown that school-books are often written for experts by experts and do not take account of the language that is used by students. But whereas in the Anglo- Saxon countries a good scientific text is a text that can be understood by many people, in other European countries and especially in Germany there has for centuries existed the tradition, that everything that could be understood by ordinary people would be called derogatorily 'popular-science' which comes quite close to unscientific, bad, and wrong. Therefore textbooks from Anglo-Saxon countries very often are better understandable and more fun to read.

If you want to reach true reading literacy you must consider reading-strategies not only in the teaching of languages but it must be important in all subjects and research techniques, information processing and information transfer must be one of the main topics in all subjects.

3.4.4 *Problem- solving strategies*

As the Programs for International Student Assessment have shown many students do not have adequate problem-solving strategies at their disposal.
It is a fact that the student nowadays sometimes learns more to tackle and to solve problems through virtual problem- solving in his computer-games at home (I am referring especially to adventures and economy simulations) than in most of his school-lessons.

Instead of prescribing routing strategies school must offer the opportunity to the student to try alone and together with others to find various solutions, to verify or to falsify them.

And the student will be the more interested in the solution of a problem the more it is part of his life. By really achieving something in real life, by trying to solve a problem that he is really interested in, the student learns and internalises what he has learnt.

3.4.5 *Autonomous Learning*

If I am talking about the concept of "**L**ife **L**ong **L**earning", I am just repeating what seems to be self-evident and generally accepted. We all know today that we are all forced in our lifetime to keep on learning. But in order to follow this advice we must also know how to learn effectively. Here school must lay the basis and make us acquainted with different ways of learning and show us how we presumably achieve the best results. We should know which kind of learner we are and how we can quickly learn something new.

It is also the school's task to reinforce the experience that we were endowed with from birth: Learning is fun! Learning is useful and rewarding!

But this is not possible in a system which largely stresses failures.

3.4.6 Dealing with new technologies

Many people today consider the use of computers as equally important as reading, writing, and calculating. But whereas it is not too costly to foster the key competences that I have mentioned so far it costs quite a lot more to teach our kids how to use the computer and the internet. And it is above all at this point where we can hear many warning voices that talk about the great "Digital Divide" that might even more divide the haves and the have-nots. What about the countries that do not have the financial means to equip their schools with the new media or to open up the new ways of communication to their people? It is possible that this divide will not only exist between countries but will also pass through the very heart of one country dividing the people in the cities from the people in the countryside. But whereas computers and the internet are the writing on the wall for some, they are the great hope for others. For the first time in history the underpriviledged are given the chance to have access to global information, to a global market and they are not dependent on corrupt intermediaries or governmental censorship. Here, so they say, is the historical chance to bridge the gap.

I think the access to the new technologies will be a crucial point in the whole process of educational reform, especially for the poorer countries. Here governments and administrations must establish priorities and perhaps work together with private enterprises and sponsors. You can complain and try to reject this development but you will not be able to stop it.

3.4.7 Emotional Intelligence

When our students leave school they should be critical members of our societies that will cooperate with their fellow citizens and accomplish something meaningful. Of course we want all our kids to be happy and follow their chosen paths successfully but we do not want them to do it at other people's expenses. That's why we would like our youngsters to possess not only intellectual flexibility but also sociability, kindness, and empathy. International research has shown in recent years that these factors that can be summed up as "emotional intelligence" often play a more important part in our life and for our pursuit of happiness than the factors of abstract intelligence that have been stressed by schools for centuries.

Our schools must work in that direction although we all know that the influence of the family, the peer-group and the media plays a dominant role

But I am also quite sure that our schools can influence society positively because school is not only a mirror of society but society can be a mirror of its schools. As a matter of fact our young ones spend most part of the first two decades of their lives together with teachers and classmates. We can decide if we want to prepare them for society through the daily rat-race, where everybody wants to be better than the other or in a cooperative and humane ambience where all work together towards a common goal, where everybody contributes with his strengths to the common aim.

I have talked to you about the changes in our world and in how far they affect the content and the goals of our school programs. Let us have a closer look at the way we are teaching or should be teaching.

4   HOW SHOULD IT BE TAIUGHT?

The last decade has brought us new insights into the mechanism of learning and although there is still much investigation to be done above all neurophysiological research has corrected many assumptions and mistakes of our conception of teaching and learning.

How do we learn?

We learn constantly and with all our senses

We learn actively

We all learn differently

We cannot plan learning

4.1 How do we learn?

4.1.1 We learn constantly and with all our senses

Whatever we see, hear, taste, smell, or touch, triggers a learning process with us. And in the majority of cases we do not even notice that in our subconscious we have just changed, modified or complemented our knowledge and our world -concept – We have learned something.

For a long time the interrelation of all our senses in the process of perception has been underrated. Today we know that often at school the learning-surrounding, the background-noises, the smell and the colors that we perceive are as important as the traditional subject-matter. And there is always an emotional component involved. It is of importance for the learning process how I feel in my learning surroundings and which emotional links exist between all the participants of the learning situation. So e.g. recent brain research has proven that not only the regions that had been identified as speech centers long ago are active when we are dealing with language but the whole brain. And there have even been hypotheses that the entire limbic system plays a part when we receive and process information.

4.1.2 We learn actively

Perhaps the most erroneous concept of learning that we have cherished for centuries can best be described by the picture of a funnel. Thus the teacher crams in lots and lots of important facts and details into the student's brain who more or less passively swallows or takes up all the information. Sure – it is sometimes quite hard to get in all the information but somehow a good teacher with good teaching methods succeeds in the long run to fill in what he wants to. The teacher teaches the new vocabulary and the student shows in the test that he has learned it. Is that really the case?

Today we know – thanks to the findings of brain research that the process of perception, the intake of knowledge is a complicated and active process. You do not learn automatically what you are being taught, even if the teacher uses the best methods and the most brilliant tactics of persuasion. The learner creates his knowledge himself. He compares the new information to the information that has already been stored, alters, replaces, complements the existing concept or rejects the new information. Learning means change. And with every change we also change our conception of the world.

4.1.3 *We all learn differently*

It was not before the 70s that most of us understood for the first time that we are all different types of learners. Some people can learn better when there is music at the back. (By the way a successful method that has been utilized in so called-super learning courses). Others must switch off the radio if they want to concentrate. We know now a lot more about the visual learner, the tactile learner, the left-brain type and the right-hemisphere learner. School lessons appeal to the average learner that does not exist in reality.

4.1.4 *We cannot plan learning*

The most important pedagogical movement of recent years, the so-called constructivism has put all these theories into one radical sentence: "We cannot plan learning!"

If we take the different learning-dispositions of different learners for granted, if we consider all the various factors which make up learning, we can only presume, if what we teach is being received, processed and stored and how it is done. So it is outright absurd to call one single lesson successful or to conclude from a good test result that the learners have learned what we expected them to learn. Repeat the same test after half a year, have a look at what the learner does with his knowledge outside school, and you will be astonished of how little really is left or is used in real-life situations.

But do all these psychologists that shatter our concepts of good teaching and effective learning also tell us which are the best conditions for learning? Do there exist any factors that support learning and show lasting results ?

Effective Learning

Emotion

Motivation

Action

EFFECTIVE LEARNING

All Senses

Autonomy

Success

4.2   Effective Learning

4.2.1   *Motivation*

Without any doubt the motivation to learn is the most important factor towards effective learning. Most students who study for a subject at school do so because there exists a curriculum and a school-schedule which this subject is part of. Furthermore they need some credentials or certificates when leaving school and this subject belongs to the (final) exam.

They study because they want to be promoted or they fear that thy get into trouble with their parents when they come home with bad grades. If they are given the choice of choosing a subject they often go for the easy one, the one where they expect to get better grades

Most studying is done out of an extrinsic motivation. The fear of punishment and the hope for some reward are the driving forces that make most of our students tick.

Sure -there are sometimes additional factors: Some might choose a language because they want to visit the country or have met some nice person who speaks this language. Or some are interested in certain subjects because at an early age they know already which professional career they might take. And there are of course some students who have not lost their innate curiosity and are eager to learn something new.

But why must students e.g. learn a foreign language which they are not interested in and which they will never use in their lives again? They study because they are expected to do so and will finally perhaps get a reward in form of a graduation diploma. The result of these studies is often next to nothing because , as the research on learning has shown us, you only learn effectively if what you must learn seems to be worth-while to you. Forced learning has no lasting effect. If you only study for an exam your brain automatically erases what you have learned as soon as you do not need it any more.

4.2.2   *Emotion*

An important factor for effective learning which has been neglected by motivational research is the emotion with which you approach your school, your teacher, your fellow-students and the subject-matters.

Positive emotions such as the enthusiasm you have for a text, the fun you have in your Math lessons or the sympathy for the teacher support your study whereas negative emotions such as fear, rejection and anger can block your learning and sometimes even lead to a subconscious or open refusal to everything connected with school.

Therefore the school atmosphere and the teacher-student communication at a school play an important part. Friendly teachers and a cooperative working-place help overcome learning difficulties and aggressive behavior.

4.2.3 Doing

When you learn e.g. a foreign language you want to do something. You want to have some information, you want to inform someone, you want to get into contact with other people or you want to express your feelings.

So when reading a foreign language text you use the language as an instrument. But this does not seem to be the case in many school-hours. You learn the language for the language's sake, you learn Math for Math's sake and not because you need it to solve some task that has got nothing to do with foreign language or math.

100 years ago John Dewey has declared 'learning by doing' the main principle of effective school-work. But only now and then, especially before the vacations some schools remember his words and indulge in some project-work

4.2.4 All Senses

We have seen that we learn best by using 'our brain, our heart, and our hand' as some educational reformers put it long time ago. Again here the project-approach is the most rewarding because we also give those students a chance whose strength lies in other fields and whose 'intelligences', as Gardner would say, tend to be less analytical and linguistic.

4.2.5 Autonomy

It must be the aim of a good teacher to make himself unnecessary. The moment the student sets out on his own to do some research, to read a book, to study at the library, without the teacher's order or the imminent danger of a test, real learning begins.

Since learning doesn't mean to swallow knowledge passively but create the world anew all forms of autonomous learning will be more successful in the long run, although they surely are not always easy and comfortable and take more time. When the student starts to put up his proper goals for learning the teacher has fulfilled his task.

4.2.6   *Success*

Whenever we do something we are cheered on by success. Success results from success. A student who again and again has been shown his faults and shortcomings soon loses the courage to tackle difficulties and to overcome setbacks.

Let me talk finally about two aspects that are of vital importance for the schools of the future:

4.3   The Role of the Teacher

If the students take the active part as I have described above, the teacher's role also changes. Instead of instructing and assessing the new teacher must help, support, and evaluate as a leader, moderator and friend. Instead of being the referee the new teacher must be the coach, a difficult task for some teachers who fear that they might lose their authority: But is it really authority if it is only grounded on the status and the title? Fortunately there have always been teachers who have taken this role .

I have often been asked: What makes a good teacher? And I have told people that I have changed my opinion in the last three decades in the teaching profession. At first I thought that the most important trait of a good teacher should be his knowledge, his expertise and the enthusiasm with which he represents his discipline. In the second decade of my teaching career I thought that it should be equally important to know how to teach, to master the tricks of the profession and to know a lot about methodology. But in the last more than ten years there has been added a third important trait that I consider to be indispensable for any good teacher: It is an optimistic conception of life, a positive attitude towards other people and the wish to help young kids find their way in our world. Of course the three aspects are important, but I must confess that I think the last one to be by far the most important. A sense of

humor, the capacity to kindle a flame in the young learner and much patience, a lot of patience, are excellent ingredients to make a good teacher.

In thousands of in-service courses world-wide we tell the teachers about teaching method, we try to persuade them to teach in a way that they perhaps will never follow because it does not match their characters and personalities. We rejoice in the possibility of forming good teachers that do exactly what we have told them to do. In most cases we do not really ask ourselves if the teacher can make use of what we have told him and, what is even more important, if his students take some profit from it. It is a phenomenon of educational congresses, seminars for teachers and discussions in the ministries of education, that always after a short time the reason for the meeting has been forgotten: the welfare, the happiness and the future of our students. I sometimes almost fear that the best schools in theory would be the schools without students and the best teacher seminars would the ones where everybody feels happy and can at least for some time forget that the purpose of the meeting and the hidden target group are our students.

After many years of school visits and after experiencing hundreds of exam and demonstration lessons I have become more and more doubtful about what we are doing, when we are giving someone a grade for teaching. In most cases we only tell the young teacher that he has been able to entertain us, that he has met our expectations and that in times of unemployment he might have a fair chance of finding a job as a show-master or entertainer.

If we look at the criteria that we have established for effective learning we should perhaps establish criteria for effective teaching or let me better call it the creation of an environment that might support effective learning.

Many examiners pay much attention to the panel painting, the structure of the lesson, the operationalisation of teaching aims, the use of media, the homework assignment etc., etc.

Let's ask some other questions:

- How does the teacher motivate his students?

- Does he make them curious?

- Is there a component of positive emotion in the classroom?

- What about the teacher's sense of humor and his willingness to laugh at himself?

- Do the students produce something or prepare an action?

- How does the teacher encourage the students to find new ways, to leave beaten tracks etc.?

- Is it possible for all students to be successful and to make mistakes?

- Do the students have the opportunity to learn with all senses?

- How does the teacher react to unexpected situations?

etc.,etc.

Let's talk about one final chapter that is always very important for all teachers.

4.4   Evaluation

If we want to reform schools we must also question the dogma that students only learn if they get grades for it. And if it is really the case, we must ask us why and if it should stay like that. Adults attend a painting course or learn a new language not because they get grades for it but because they want it. The famous educator John Holt started playing the violoncello when he was almost fifty and nobody had forced him.

In the last decade there has been an interesting discussion on new forms of evaluation and there are many schools around the world which have replaced the old grading system by a system of self-assessment. In Europe especially in language teaching there exists a tendency at the moment to complement the grading systems by new forms of evaluation and assessment. I would especially like to mention the portfolio-movement, which has led to the introduction of a common European language- portfolio in which the students collect the work they have done and present it to the interested person, who can be member of a graduation committee, the future employer or the department head of some college.

5   CONCLUSION: The will to change

I have tried to develop some ideas that in my opinion should be at the core when we are talking about school reform. Of course there remain important aspects that I could not deal with in my speech such as

- the structure of schools and changes to its organisation

- the opening of schools towards the surrounding community

- the evaluation of schools and school-systems by outside observers

It is a common mistake and sometimes I think welcome pretext to do nothing at all if people say that changing schools for the future is above all a question of money. Sure – we do not get it free of charge- and especially for the new technologies we also need financial efforts.

But first of all there must be the will to change schools and to leave the beaten tracks.

If we want to build a school for the future we must be willing to break taboos, to ask questions that we were not allowed to ask so far, and to open the door to a world that we do not know in detail.

Perhaps some of my ideas seem quite utopian to some of you. I can confirm you that there are enough schools world-wide that have had similar ideas and that have set out on their ways and have had better results than most of the schools that we normally see.

As a matter of fact " Everything has been said before" but as the German comedian Carl Valentin once put it "unfortunately not by everybody".