Development of textbooks and other teaching and learning materials
Module 5
Development of textbooks and other teaching and learning materials

This module explores the role that ministries of education can play in providing easily accessible and quality textbooks. It also discusses the increasing role of technological media as a support or substitute for print school materials and how to take advantage of teaching resources at the school and community levels for this generation.

The activities suggested in this module offer opportunities for curriculum developers to consolidate their understanding of policies and processes related to textbook development and other teaching and learning materials, particularly with respect to:

1. Policy management. General options for the development of textbook policies.
2. Decisions about implementing e-learning. Highlights particular points to be considered when planning the implementation of e-learning strategies.
3. Production and/or acquisition of supplementary teaching and learning materials. Enables discussion on a wider scope of teaching and learning materials.
4. The teacher as a curriculum developer. Discusses teachers’ capacities and efforts to develop contextualized curriculum materials sensitive to the local conditions.

Following these activities is a list of resources that contains documents and case studies to which references are made in the activities, as well as complementary reading material.

Considerations regarding the development of textbooks and other teaching and learning materials

Equal access to quality basic education is a key policy target in all countries. Under this paradigm, quality teaching and learning materials should be available for all students.

The module also explores existing trends and processes in textbook development. Accordingly, curriculum developers will learn about the obstacles that publishers, ministries of education and other actors in the field may encounter while attempting to provide high-quality, easily accessible textbooks.

The textbook is one type of resource and a critical one in many contexts. In developing countries, textbooks may be the de facto syllabus. In addition to the teacher, they may be the most important tool for learners in the acquisition of knowledge and skills. They may also be the only source of information about the curriculum for the teacher, the only books available in the household of the average child and the main source of reading for the learner.

Under ideal circumstances, in addition to textbooks, teachers should have other supplementary teaching and learning resources available. Internet access allows for tremendous opportunities to provide materials that supplement textbooks and enrich the learning environment. However, the rapid availability of these new materials also presents challenges to traditional approaches in the evaluation and approval of teaching and learning resources.

As with the introduction of any new technological device, there is initially a tendency to use information and communication technologies (ICT) in the same manner as older, better-known learning tools. As teachers in many nations are exploring the most effective ways to integrate ICT into the curriculum, their teaching style
has been influenced. For instance, students are now more likely to access global repositories of information through ICT than base their learning solely on print textbooks. Learners can also be more responsible for self-teaching, which results in a shift in the role of teachers from a transmitter of knowledge to more of a facilitator that provides orientation and support in browsing and organizing information in a constructive way.

**ACTIVITY 1**

**Textbook development, procurement and evaluation**

The textbooks provided to schools should be accurate and contain up-to-date information. A range of planning and policy issues should be examined in detail before committing to new textbooks to ensure that resources are efficiently used and to guarantee the highest-quality product possible. These issues are presented in Table 5.1 according to where they are likely to emerge in the development process.

**Table 5.1. Planning and policy issues to be examined in textbook development**

<table>
<thead>
<tr>
<th>Management</th>
<th>Preparation</th>
<th>Production</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection of subjects requiring textbooks.</td>
<td>Choice of authors, preferably through open competitive bidding.</td>
<td>Open competitive bidding for printing and publishing.</td>
<td>Support for public and school libraries.</td>
</tr>
<tr>
<td>Use of national and local languages in instruction and textbooks.</td>
<td>Multiple textbook titles.</td>
<td>Consideration of textbook/pupil ratio if textbooks are provided by the state.</td>
<td>Open competitive bidding for distribution.</td>
</tr>
<tr>
<td>Timing of curriculum reform and revision.</td>
<td>Availability and provision of supplementary reading and other learning materials.</td>
<td>Appropriateness of textbook design for grade levels.</td>
<td>Practical and economical distribution methods.</td>
</tr>
<tr>
<td>Procedures for the evaluation and approval of textbooks.</td>
<td>Professional development for authors, publishing personnel and educators.</td>
<td>Technical specifications for paper, printing and binding.</td>
<td>Regular and timely release of approved textbooks.</td>
</tr>
<tr>
<td>Criteria for the selection of textbooks.</td>
<td></td>
<td>Affordable and sustainable financing.</td>
<td></td>
</tr>
</tbody>
</table>


Textbook revision is commonly part of the curriculum process and generally supports the introduction of new and updated content (learning) and methodology. Therefore, in those cases where an industry of private publishers exist, revision should be part of a planned cycle so that textbook publishers are encouraged to invest in supporting any new curriculum.

In the case of external donor-funded initiatives for textbook development, it is possible that donors will insist on an international competitive bidding process. However, it should be noted that this may run the risk of channelling funds for textbooks out of the recipient country.
On the contrary, cooperation and co-publishing can aid the transition to sustainable competitive provision of textbooks and other learning materials. Cooperation may be exercised by one country through the adaptation of a textbook produced in another country, or a joint venture between a local publishing house and a well-established international publisher in a developed country, involving the transfer of publishing knowledge, experiences and skills, as well as capital.

Policy trends in textbook development

In some countries, ministries of education house their own textbook publishing units. These units are responsible for the production of all textbooks with little or no reference to local or private publishers. This strategy can be cost-effective and useful in countries where a sufficient commercial market for stimulating private interest in the textbook industry does not exist. However, it may also imply a lack of diversity in books and potentially reduced quality.

Policy trends in textbook development reflect a shift towards private, market-driven systems of private textbook publishing. In some countries, the role of developing, producing and distributing textbooks is already a private enterprise which bases its books on the curriculum syllabuses for each subject. Under these circumstances, the role of the government may be to:

- Starting with the curriculum framework, prepare clear and detailed guidelines through curriculum policy that orient the development of textbooks and other teaching and learning materials. These guidelines should be shared with textbook developers for the development of textbooks;
- Establish minimum standards for quality and ensure their use in monitoring to conduct objective evaluation and approval of textbooks; and
- Determine the source of textbook financing and fund allocation, as well as the method of distributing the materials to schools.

In this regard, ministries of education need to ensure that the quality of textbooks and other materials is of a high standard and that processes for publication, approval and distribution are conducted in a cost-efficient and timely manner.

Textbook evaluation and approval

Ministries of education usually recognize the need to establish independent evaluation boards to objectively assess textbooks. These boards are more objective and accountable than internal committees, which may simply be extensions of the ministries’ own curriculum departments.

Some countries, including Viet Nam and Germany, maintain rigorous evaluation and testing processes before materials can be used in schools. In these countries, publishers are required to pilot an entire textbook or sections in selected schools before they are authorized to produce the books. For instance, in Québec, Canada, foreign language textbooks must pass five separate evaluation panels that assess content for pedagogy, equal opportunity, potential sexism and racism.

The main textbook approaches, in which a number of publishers produce textbooks and seek the approval of the Ministry of Education or allow market preferences to determine the best book, imply the abandonment of monopoly. It can also signify the removal of government control over textbook development and the empowerment of the local school principal or teacher to select the textbook that best implements the syllabus. Such an approach would need to be introduced in a carefully-planned manner to avoid teacher uncertainty, higher costs and issues related to teacher training.

In those countries that adopt multiple approaches to textbook development, there are complaints about the evaluation process. For example:

- In the Philippines, publishers have complained about inconsistencies in the appraisal process. According to one account, some books were granted conditional approval, even though they did not cover the entire curriculum, while others were rejected on the basis of an illustration or exercise.
In Kenya, the government has been accused of favouring the former state publishing house.

In Romania, education officials are allowed to become authors of competing textbooks, which has raised concerns about conflicts of interest and subjective influence over subordinates.

Focus of the activity

This activity and suggested tasks should help participants to explore a range of planning and policy issues that impact the availability and selection of new, accurate and up-to-date textbooks, ensuring that resources are efficiently used.

**TASK 1** Individual assignment or work in small groups

1. Read the document “Control and supply of school textbooks in selected countries” and identify one example that is most similar to your context, as well as one example that is the most different. Explain the reasons why the situation that is the most different would be difficult to implement in your context, but also why it might be interesting to try.

2. Read the document “Comparative tables of textbook provision policies in Latin America” [Cuadros comparativos de las políticas de provisión de libros de texto en América Latina].

3. Describe a programme in your own context, and indicate who is responsible for printing, distributing and financing it.

**TASK 2** Individual reflection

1. Read the case study “Textbook provision scheme in Brazil”.

2. Analyse the case study, based on the following questions:
   - What is the difference between the centralized and decentralized policies for textbook provision?
   - What similarities and differences exist between the actors and processes involved in the Brazilian case and your situation?
   - Generate a short list of all participating agencies, noting the main functions of each one.

**TASK 3** Work in small groups

1. Share the insights gained from textbook provision in Brazil with your classmates. Discuss practices that could be applied to your own context.

2. Create a flow chart illustrating the major steps in textbook provision.

**PRODUCT** Flow chart

**TASK 4** Work in pairs

1. Read the document “Overview of textbook development processes: conditions for, and characteristics of, effective textbook provision” with your partner.

2. Prepare an electronic presentation of about seven slides on textbook development processes in your context. Consider the following ideas:
   - Identify the main parameters for the management of textbook development that are appropriate to
your context. Your assessment should be based on the Brazilian case study, as well as information about your own country’s policies. Some areas for consideration may include, but are not limited to:

- Selection of subjects requiring textbooks;
- Use of national and local languages in instruction and textbooks;
- Timing of curriculum reforms and revisions;
- Resources required for textbook production; and
- Procedure for evaluation and approval of textbooks.

Use the following questions as a guide for analysing textbook development policies in your context:

- What subjects require textbooks and teacher guides?
- Is the language used in available textbooks different from the one used in teaching?
- What is the composition of your textbook development team?
- How often do you revise textbooks and teacher guides?
- Who approves textbooks and teacher guides?
- Is there only one textbook approved for each subject, or are there multiple titles?
- What is the textbook/pupil ratio?
- How are textbooks made available to schools, teachers and students?

**TASK 5**  Work in small groups

1. Read the following resources. Compare the aspects of textbook production and distribution described in each case. Discuss the most interesting points with your group members.
   - Case study “Uzbekistan basic education textbook development”.
   - Case study “Textbook rental scheme: Macedonia”.
   - Document “Textbook Quality Improvement Programme – support to basic education in Iraq” (Part I).
   - Case study “Principles and processes for publishing textbooks and alignment with standards: a case in Singapore”.

2. Use the following questions to guide your analysis:
   - What mechanisms currently exist for the production and distribution of textbooks?
   - What are the primary constraints on the adequate provision of textbooks in your context?
   - What principles for developing textbooks would you consider?
   - What are the next steps required to develop capacities for effective and economic textbook production and distribution?

3. Produce a poster that summarizes the issues related to textbook production and distribution. The poster should be approximately 80x60 cm. It should illustrate the current system and its constraints and provide recommendations.
1. Read the case studies “Textbook evaluation through quality indicators: the case of Pakistan” (pp. 9–11), “Criteria for textbook evaluation: Azerbaijan” and “Criteria for evaluation of technical quality of textbooks in Romania”.

2. Use the following questions as a basis for analysis:
   - What factors for the evaluation of textbooks are covered in each case?
   - What factors are common?
   - How are these factors evaluated?

3. Based on your own context, consider other factors used to evaluate textbooks that are not included in the above cases.

4. Develop a set of criteria for textbook evaluation and write them onto a flip chart.

**TASK 7**  
Plenary discussion

1. Read the case studies “Gender issues in Polish school textbooks” and “Bias detection criteria for textbooks: Sri Lanka”, as well as the document “Textbook Quality Improvement Programme – support to basic education in Iraq” (Appendix 1).

2. Revise your criteria for the inclusion of bias detection and discuss it with the group.

**TASK 8**  
Plenary discussion

Participants should divide into groups and discuss the textbook evaluation criteria. Also consider the political, structural or practical constraints that exist in your country and how to best address these. Develop a set of criteria together, considering the possibility of assigning a relative weight to each of the standards. Each norm should include a rating scale based on different levels (e.g. “good-fair-inadequate” or “present-absent”) or descriptive characteristics (e.g. “the scientific content is accurate – some of the paragraphs contain inaccurate content – there are several significant mistakes”).

**PRODUCT**  
Report on criteria used in the evaluation of textbooks and teacher guides

**TASK 9**  
Individual assignment

1. Obtain a copy of any textbook and/or teacher’s guide used in your subject area.

2. Evaluate the textbook and/or guide based on the criteria developed during the plenary session in Task 8.

3. Use the following questions as a basis for analysis:
   - Do the textbooks and/or guides meet the requirements for approval?
   - Which aspects of the material(s) need improvement based on the criteria?
   - What revisions are necessary to improve the material(s)?

4. Prepare a short report on the material(s) analysed using a table format.

**PRODUCT**  
Report on textbook evaluation
E-learning is used as a general name for all ICT-enabled learning activities. The incorporation of e-learning activities in school systems drives teaching material requirements quite far from what is necessary when using traditional learning supports such as textbooks. It requires a functional infrastructure, including appropriate hardware and reliable, high-quality software. Advanced planning on the availability of significant ongoing technical support and reliable telecommunications connections is also required. At the national decision-making level, equality implies that policies should specifically consider supporting small and rural schools in effectively adapting e-learning and information literacy.

Some learning opportunities enabled by the use of ICT include:

- Repetitive drills for developing low-level skills, with immediate feedback;
- Inclusion of pictures, audio and video-clips in school assignments;
- Ability to search for information using multimedia databases;
- Increased communication assignments using blogs, e-mail and chat interfaces;
- Programmed distance instruction using the web, after school hours;
- Use of games and other stimulators;
- Sensor-based applications for capturing data in experimental activities; and
- Computerized assessment, virtual portfolios and online surveys.

The implementation of e-learning requires a clear vision and direction, at least at the school level, because decisions regarding materials are costly and resources can quickly become outdated.

Based on the perspective assumed, these decisions range from:

- Adapting or developing lesson plans for e-learning activities according to the curriculum;
- Devising specific instruments for assessment, monitoring and analysis of students’ skills;
- Planning and providing professional development for teachers in the use of ICT and its implementation in e-learning contexts;
- Supporting schools in the integration of ICT-based systems into the dynamics of the school day;
- Deciding whether to select free-license materials or buy commercial, copyrighted materials; and
- Developing a policy to regulate ICT use so that students do not circulate improper material.

Teaching programmes that incorporate e-learning require sustained capacity development for teachers because of the wide variability in teacher expertise and confidence. Sometimes schools participating in ICT-related professional development clusters can join efforts in the capacity development process; however, support and professional development is usually based on the specific needs derived from concrete e-materials that each school selects.

Focus of the activity
This activity should help participants to conceptualize e-learning and analyse the challenges and impacts of using ICT-based learning tools.
**TASK 1  Individual assignment**

1. Read the document “Curriculum and knowledge in the digital era” and highlight six provocative statements for further discussion. Please also read the case studies “E-Learning in Japan” and “Study on the use of ICT in school education” [Étude sur les usages des dispositifs TIC dans l’enseignement scolaire].

2. Use the following questions as a framework for analysis:
   - What does the advent of a digital era imply for the “traditional” uses of textbooks?
   - What are the features of e-learning?
   - What are the lessons learned from each of the cases?
   - What conditions facilitate or hinder the use of e-learning in your country?
   - What alternatives are available to achieve quality education without using e-learning in your country?
   - How are these alternatives being used in schools?

3. Read the document “Quality guidelines for educational online content and its practical applicability”.

4. Select an interesting educational Internet resource and use the criteria suggested in the document “Quality guidelines for educational online content and its practical applicability” to assess the feasibility of using this resource in your context.

**TASK 2  Plenary discussion**

Two groups will each make a presentation. One group will present on the practical difficulties related to implementing e-learning and another will discuss the various opportunities resulting from the use of e-learning.

**TASK 3  Individual assignment**

1. Choose a particular curriculum area where you believe it is feasible to implement a lesson plan that intensively utilizes ICT.

2. Assuming you have the decision-making power to implement the lesson plan in a number of schools, reflect on the following questions:
   - Would you prefer to use commercial software or custom-tailored software?
   - Would your plan include the use of web pages or e-mail? Would you draft a policy addressing the safety of students who access the Internet?
   - What assessment practices could be used to evaluate the learning process?

**TASK 4  Work in pairs**

1. Explain the decisions you made in the previous task to your partner and request feedback.

2. Reconsider your previous decisions after receiving your partner’s feedback and produce a short summary of your proposal that you will include in your portfolio.

**PRODUCT** Proposal to implement an ICT-based lesson plan
ACTIVITY 3
Supplementary materials for teaching and learning

The formats used to specify the content that will be taught, in the form of subject-specific syllabuses, teacher guides or other documents, describe what is to be taught and learned from the subject and provide a range of other information for teachers, as well as the community, textbook developers and publishers. Therefore, the challenge for curriculum developers resides in notifying teachers about the various materials, besides textbooks, that can contribute to improving the quality of education and the achievement of learning outcomes specified by the curriculum.

Several types of print and non-print materials are currently being used in many countries. These include supplementary reading books, comics, posters, flip charts, videotapes or DVDs and electronic materials.

The choice and use of these multimedia teaching and learning materials depend on the available technical and financial resources of each country. Also, helping schools and individual teachers to make informed judgments about the materials that are selected and used to promote the preferred learning styles of the students, through capacity development activities is critical.

Focus of the activity
This activity and suggested tasks should help participants to discuss specific options and criteria so they can select supplementary materials and recommend their use.

TASK 1
Work in small groups

1. Read the case study “Non-print learning materials in Indonesia”.
2. Read the document “Learning objects and learning theory”.
3. Use the following questions to guide your analysis:
   - What are the advantages of using non-print/electronic materials for introducing the topics?
   - How can these materials be used in the teaching and learning activity?
   - What conditions in your country may enable or hinder your ability to develop and use non-print or electronic materials in teaching?
   - What recommendations and quality criteria can be taken into consideration?
4. Develop a list of ways that you might be able to include non-textbook materials in a particular subject in your context.

PRODUCT
List of opportunities

ACTIVITY 4
The teacher as a developer of curriculum materials

In some cases, textbooks used in schools have been developed by teams of subject area specialists who are not familiar with the range of implementation issues that may arise in schools. In these cases, the examples cited in textbooks that are used to explain concepts and principles might not relate to the experiences of teachers and students.

Supplementary teaching and learning materials that use community resources and events can be more relevant and interesting to students because they can easily relate to the materials. Therefore, teachers are encouraged to develop teaching and learning materials to supplement textbooks by drawing upon local resources and settings.
Supplementary teaching materials are not designed to cover the full range of experiences students may need to acquire all concepts and skills required by the syllabus. Rather, the materials are used to enrich the students’ learning experiences and consequently foster positive attitudes towards the subject and learning in general.

Focus of the activity
This activity and the suggested tasks should help participants to conceptualize the role of the teacher in the process of cultivating ownership of a particular curriculum resource.

**TASK 1** Individual assignment

1. Choose one example of a supplementary teaching material you would like to develop (e.g. poster, comic strip, games, experiment guide).

2. According to the features of the sample you have chosen, develop your own supplementary material using a topic that is relevant in your context.

3. Use the criteria developed in previous tasks on making teaching and learning materials to help you in designing the supplementary material.

**PRODUCT** Draft teaching material

**TASK 2** Individual assignment

1. Choose a topic from your curriculum. Review how the textbooks and teacher guides discuss the subject.

2. Reflect on your home and school environment. Which situation best explains the topic selected in Part 1 while also developing competency in this area?

3. Rewrite the lesson using the local situation.

**PRODUCT** Contextualized lesson

**TASK 3** Exhibition and plenary discussion

1. An exhibition of the materials developed in Task 1 or 2 is displayed in the conference room. The participants are given time to examine the materials. Then, a question and answer session that includes feedback for each participant is conducted.

2. A practical closing discussion is held during which participants support a team of teachers by coaching them in the production of curriculum materials adapted to their students’ needs.

3. Participants then develop a list of their reflections, including the types of recommendations they would share with the teachers about planning, selecting introductory materials, identifying resources, methods of assuring quality, as well as any cautionary advice.

**PRODUCT** Practical advice for coaching

**PERSONAL LEARNING NOTE TO BE INCLUDED IN THE PORTFOLIO:**

What did I learn? What concepts did I find useful?
List of resources for MODULE 5
Development of textbooks and other teaching and learning materials

Documents

- Control and supply of school textbooks in selected countries.
- Comparative tables of textbook provision policies in Latin America [Cuadros comparativos de las políticas de provisión de libros de texto en América Latina].
- Overview of textbook development processes: conditions for, and characteristics of, effective textbook provision.
- Textbook Quality Improvement Programme – support to basic education in Iraq (Part I).
- Curriculum and knowledge in the digital era.
- Quality guidelines for educational online content and its practical applicability.
- Learning objects and learning theory.

Case studies

- Textbook provision scheme in Brazil.
- Uzbekistan basic education textbook development.
- Textbook rental scheme: Macedonia.
- Principles and processes for publishing textbooks and alignment with standards: a case in Singapore.
- Textbook evaluation through quality indicators: the case of Pakistan (pp. 9–11).
- Criteria for evaluation of technical quality of textbooks in Romania.
- Gender issues in Polish school textbooks.
- Bias detection criteria for textbooks: Sri Lanka.
- E-Learning in Japan.
- Study on the use of ICT in school education.
- Non-print learning materials in Indonesia.

References


Control and supply of school textbooks in selected countries

Table 10 - Control and supply of school textbooks

This table outlines:

- who produces textbooks (state or commercial bodies)
- whether the State (or devolved authority) prescribes content etc. of textbooks
- whether the State (or devolved authority) draws up a list of authorised textbooks
- who selects textbooks for use in class
- whether textbooks are provided free by the State (or devolved authority), or whether parents are required to buy them

<table>
<thead>
<tr>
<th>Country</th>
<th>Textbook production</th>
<th>State provides list of approved textbooks</th>
<th>Choices of books for use in class</th>
<th>Textbook provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>Commercial</td>
<td>No</td>
<td>Teachers – free choice</td>
<td>School provides/lends</td>
</tr>
<tr>
<td>Ireland</td>
<td>Commercial. Ministry provides guidelines and may produce/commission materials for distribution</td>
<td>No</td>
<td>Teachers – free choice</td>
<td>Parents usually buy or rent from schools. Some state subsidies available.</td>
</tr>
<tr>
<td>N. Ireland</td>
<td>Commercial</td>
<td>No</td>
<td>Teachers – free choice</td>
<td>School provides</td>
</tr>
<tr>
<td>Scotland</td>
<td>Commercial</td>
<td>No</td>
<td>Teachers – with consultation of school board</td>
<td>School provides</td>
</tr>
<tr>
<td>Wales</td>
<td>Commercial</td>
<td>No</td>
<td>Teachers – free choice</td>
<td>School provides (on loan)</td>
</tr>
<tr>
<td>France</td>
<td>Commercial – state approved. Local/regional associations and documentation centres may produce teaching materials to supplement those published for national use.</td>
<td>State prescribes content and format, approves all textbooks for use in schools, and provides list of approved texts.</td>
<td>Teachers – from list of approved textbooks</td>
<td>Compulsory education – school provides. Post-compulsory, parents usually buy</td>
</tr>
<tr>
<td>Germany</td>
<td>Commercial– Länder approved</td>
<td>Länd prescribes cost, content, format and quality and provides list of approved textbooks. RE textbooks are approved with the agreement of the church authorities.</td>
<td>Teachers – generally from recommended list, but can select additional material.</td>
<td>School provides (on loan)</td>
</tr>
</tbody>
</table>
## Hungary
Commercial (state approval). The State underwrites bank loans to publishing companies. State generally prescribes content, approves and provides recommended list. Teachers are free to select other material, in addition. Teachers – generally from recommended list, but can select additional material. Parents buy (subsidised prices) (assistance for needy). Textbooks for minority language education must be provided by the State.

## Italy
Commercial State issues guidance on cost and frequency of update, but does not prescribe or approve. Council for teachers – free choice Provided free at primary level. Parents usually buy thereafter, increasing financial assistance available to low income families.

## Netherlands
Commercial No (Ministry prescribes educational attainment targets but does not prescribe or produce specific teaching materials.) Teachers – free choice School provides at primary level (on loan). At secondary level, parents often buy books. Many schools may have book funds and provide loan books.

## Spain
Commercial under state supervision. Centre for Educational Research and Documentation (CIDE) assists in development dissemination of curriculum materials and teacher guides. No general prescription but the Autonomous Community (via the regional/local education authority) usually provides recommended list. Schools/teachers – usually from recommended lists Parents usually buy, increasing financial aid available for low income families.

## Sweden
Commercial No Teachers – free choice School provides

## Switzerland
Cantons (compulsory phase) Cantons usually prescribe content and provide recommended lists for compulsory phase Teachers – usually from recommended list; free choice for upper secondary. School provides. Upper secondary (post-compulsory) parents buy.

## Australia
Mostly commercial. Boards of Studies may publish support No Teachers – free choice Parents generally buy (or pay a levy to schools for book hire)
<table>
<thead>
<tr>
<th>Country</th>
<th>System Description</th>
<th>Approval Authority</th>
<th>Books Distribution</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Commercial (by approval). Provinces produce and pilot books</td>
<td>Province or territory usually provides recommended list of approved titles</td>
<td>District of school usually from recommended list</td>
<td>School usually provides free of charge</td>
</tr>
<tr>
<td>Japan</td>
<td>Commercial with state approval, or state-produced</td>
<td>State-approved, commercially produced- (Some state-approved and state-produced textbooks with prescribed content)</td>
<td>Local boards of education or headteachers determine which books will be used from prescribed list</td>
<td>In compulsory education, all students receive new books, free, each year. Post-compulsory, parents/students buy</td>
</tr>
<tr>
<td>Korea</td>
<td>State or commercial with state authorisation or approval</td>
<td>Ministry compiles some and authorises or approves other textbooks</td>
<td>Single textbook replaced by range of government-copyrighted and approved textbooks for individual subjects, enabling teachers to choose</td>
<td>Provided free at primary level (6-12) (and students may keep, as in Japan). Thereafter, parents buy but costs are kept low.</td>
</tr>
<tr>
<td>New Zealand</td>
<td>State and commercial (Learning Media, a crown-owned company, publishes a range of resources free to schools. Use is not mandatory)</td>
<td>No</td>
<td>Teachers – free choice</td>
<td>School provides (loaned, parents contribute for damage or loss). Parents buy supplementary materials, particularly at post-compulsory upper secondary level.</td>
</tr>
<tr>
<td>Singapore</td>
<td>State and commercial with state approval</td>
<td>State prescribes content and produces Approved Textbook List (ATL). All books on the ATL are approved by the Ministry for five years</td>
<td>Teachers – from ATL</td>
<td>Parents buy, free for needy</td>
</tr>
<tr>
<td>USA</td>
<td>Commercial (dominated by about ten main corporations)</td>
<td>About half of the States recommend textbooks after some process of review against State curriculum guidelines</td>
<td>Teacher (or school committee) choice; in about half of the States from approved list (in California, for example, schools may only opt out of the state-recommended textbook system with an official waiver)</td>
<td>In most States, schools provide books to students free of charge. Some States charge all but the most needy. Others may request a contribution from students in high school (age 14+) in particular.</td>
</tr>
<tr>
<td>Region</td>
<td>Details</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>There are however set texts for certain examination syllabi. In addition, the programmes of study for English at Key Stages 1-4 contain criteria and categories from which to select the range of reading.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wales</td>
<td>There are however set texts for certain examination syllabi. In addition, the programmes of study for English at Key Stages 1-4 contain criteria and categories from which to select the range of reading.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>There are however set texts for certain examination syllabi.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>Occasionally, some post-compulsory schools (students aged 15+) may request a parental contribution for certain items.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Overview

Chart 35 is a summary of textbook provision programmes of the countries of Latin America and the Caribbean. You can see that in most countries, the Ministries of education determine the curriculum outlines and hire private publishers to develop the textbooks. Public biddings are open in order to achieve greater efficiencies in the processes of resource allocation. Almost all the textbooks provision projects are carried out with national budget and international financing.

Mexico and Cuba are the only countries in the area where the state is directly involved on a regular basis in the processes of editing textbooks for public schools. Currently, in Mexico one part of the required textbooks for secondary public school is also contracted to private publishers.

The Peruvian government has had sporadic interventions in editing textbooks and printing through public biddings for international tender. Today, edition is provided by private publishers.

The countries that finance textbook programmes with national budget are Mexico, Chile and Brazil.

Brazil and Chile are countries whose provision programmes have remained stable over time with acquisition of textbooks from the private sector. This has enabled improvements in cost structure and quality of contents and text materials.

In Colombia, procurement processes of textbooks have been decentralised through educational showcases organised by the municipal secretaries of education in cities like Bogotá, Medellin and Cartagena.

In some countries like Mexico, Brazil and Argentina, the distribution of textbooks is carried out through contributions from various public institutions to ensure effective coverage to more remote regions of the countries.

Source: Uribe, R. 2006. Programas, compras oficiales y dotación de textos escolares en América Latina [The programmes, official purchases and provision of textbooks in Latin America]. Bogotá, UNESCO Regional Centre for the Promotion of Books in Latin America and the Caribbean. (In Spanish.)
<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>Publishers</th>
<th>Printing</th>
<th>Distribution</th>
<th>Financing</th>
<th>Loan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>National Programme of Educational Grants (PNBE)</td>
<td>Private Publishers</td>
<td>Private publishers or printing</td>
<td>Public through the Argentine Army</td>
<td>International financing and local budget</td>
<td>BID Loan 1031/OC-AR</td>
</tr>
<tr>
<td></td>
<td>Global programme of acquisition of textbooks 2004-2006</td>
<td>Private Publishers</td>
<td>Private publishers or printing</td>
<td></td>
<td>Governmental loan among others</td>
<td>N.A</td>
</tr>
<tr>
<td>Bolivia</td>
<td>Production and distribution of educational materials</td>
<td>Publishers (directly supervised by MEN) or hired authors by MEN</td>
<td>By publishers or through international biddings</td>
<td>Directorate of Edition, Publishing and Distribution of MEN</td>
<td>International financing and national budget</td>
<td>Loan 126/SF-BO (BID)</td>
</tr>
<tr>
<td>Colombia</td>
<td>Rural Education Project (PER)</td>
<td>MEN hires private publishers</td>
<td>Private printers</td>
<td>Private Distributors</td>
<td>World Bank, International Organisations</td>
<td>Loan P050578 from 2000, Credit number: 70120</td>
</tr>
<tr>
<td></td>
<td>Pedagogic Showcase</td>
<td>Private publishers show their products before representative teachers so that they choose the textbooks that public schools will acquire for the development of their programmes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Country</strong></td>
<td><strong>Project</strong></td>
<td><strong>Publisher</strong></td>
<td><strong>Printing</strong></td>
<td><strong>Distribution</strong></td>
<td><strong>Financing</strong></td>
<td><strong>Loan No.</strong></td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>---------------</td>
<td>--------------</td>
<td>------------------</td>
<td>---------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>Quality Improvement programme for Preschool and Basic Education</td>
<td>Textbooks publishing are carried out by technical consultants from the Public Ministry of Education.</td>
<td>Printing can be public or private. If it is public, it is done in the national print. If it is private, biddings are called for printing.</td>
<td>Ministry of Education. Textbooks are given to Regional Principals</td>
<td>BID</td>
<td>1010/OC-CR-BID</td>
</tr>
<tr>
<td>El Salvador</td>
<td>Reform of Media Education</td>
<td>Publishers and private authors. Books delivered as part of the provision are those existing in the market.</td>
<td>Publishers</td>
<td>Private and public</td>
<td>International Financing</td>
<td>BIRF 4224-ES</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Textbooks delivery programme</td>
<td>Hired authors and supervised by MEN</td>
<td>Printing Hiring (International Bidding)</td>
<td>Collection centres generally located in departmental and municipal heads.</td>
<td>BID: Support to the Education Reform II</td>
<td>World Bank GU-0131</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Textbooks for bilingual education</td>
<td>Hired authors and supervised by MEN</td>
<td>DIGEBI</td>
<td>DIGEBI</td>
<td>BID, BM, Belgium government, International Development Agency, Education Sector Support Programme</td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>Project</td>
<td>Publisher</td>
<td>Printing</td>
<td>Distribution</td>
<td>Financing</td>
<td>Loan No.</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Honduras</td>
<td>Education for Everyone Plan 2015</td>
<td>Hired authors and supervised by MEN</td>
<td>Hiring of Mexican printers</td>
<td>Private with the participation of the Secretariat of Education of Honduras and other state entities</td>
<td>International Financing</td>
<td>Swedish Grant Agreement for the Education for Everyone Project # 052956P BM Loan # 3497, Canadian Grant Agreement # 000 12880-CA-M001-2204</td>
</tr>
<tr>
<td></td>
<td>Education improvement in mathematics area PROMETAM</td>
<td>Teachers trained in the Continuing Education Programme for teachers framework</td>
<td>International Cooperation Agency of Japan</td>
<td></td>
<td>International Financing</td>
<td>Canada: N -000 12880-Ca-M001-2204</td>
</tr>
<tr>
<td>Mexico</td>
<td>Publishing of textbooks for preschool, primary and telesecondary programmes</td>
<td>National Directorate of Educational Materials and Methods (public) and Conaliteg</td>
<td>Conaliteg is in charge of the coordination of books printing</td>
<td>Public, with collaboration of several state institutions, among them Conaliteg, Secretaries of Defence and Marine, as well as the Attorney General of the Republic</td>
<td>National government budget</td>
<td></td>
</tr>
</tbody>
</table>

**UNESCO-IBE**  
Training Tools for Curriculum Development
<p>| Secondary Textbooks delivery programme | Private publishers, DGMME carries out a textbooks evaluation process in the market and makes a list of authorised textbooks. | Public, with collaboration of several state institutions, among them Conaliteg, Secretaries of Defence and Marine, as well as the Attorney General of the Republic | National government budget |</p>
<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>Publisher</th>
<th>Printing</th>
<th>Distribution</th>
<th>Financing</th>
<th>Loan No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicaragua</td>
<td>Basic education programme (<em>Aprende</em>), component of educational strengthening</td>
<td>Publishers, public biddings to national and international tenders.</td>
<td>The chosen company</td>
<td>Public, Ministry of Education, Culture and Sports. With the financing of <em>Aprende</em> project</td>
<td>International Financing and national budget</td>
<td>Loan 3 No. AIF 281-NI (World Bank)</td>
</tr>
<tr>
<td>Panama</td>
<td>Educational development project (<em>Prode</em>),</td>
<td>Private publishers (national and international biddings)</td>
<td>Private publishers (national and international biddings)</td>
<td>Public, National Directorate of Curriculum and Technology Education with the collaboration of regional education</td>
<td>International Financing</td>
<td>Loan No. 1013/OC-PN (BID)</td>
</tr>
<tr>
<td>Paraguay</td>
<td>Basic Education Programme (stages 1 and 2 - World Bank)</td>
<td>The target populations of the project are mainly the indigenous communities, students from deprived rural and urban areas. That is why they work on editing bilingual texts, strategies such as telesecondary and distribution patterns that make the textbooks reach remote locations.</td>
<td>World Bank</td>
<td>Inter-American Development Bank, Formally approved</td>
<td>Loans No. 770/OC-PR and 908/SF-PR</td>
<td>Inter-American Development Bank, Formally approved</td>
</tr>
</tbody>
</table>
UNESCO-IBE  
Training Tools for Curriculum Development

<p>| Peru | Quality Improvement programme for Preschool and Secondary Education (2001-2005) | Private Publishers purchase products that are on the market, except for the area of “Person, Society and Human Relations”, for this case, authors are hired. | Private Publishers | Private Companies that won the public biddings, with the collaboration of decentralised entities of MEN | International Financing and national budget | Loan No 1237/OC-PE (BID) |</p>
<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>Publisher</th>
<th>Printing</th>
<th>Distribution</th>
<th>Financing</th>
<th>Loan No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominican Republic</td>
<td>Multiphase Programme for Education Equity of the Basic Education,</td>
<td>Private Publishers (national and international)</td>
<td>Private Publishers hired by the Secretary of</td>
<td>Public, Directorate General for</td>
<td>BID Financing of BM in its final stage and Spanish Agency of International Cooperation</td>
<td>Loans No 1429/OC-DR (BID)</td>
</tr>
<tr>
<td></td>
<td>Multiphase Programme for Media Education Modernisation,</td>
<td></td>
<td></td>
<td>State for Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preschool Strengthening Project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uruguay</td>
<td>Media Education Modernization Programme and teacher training (MEMFOD)</td>
<td>Private Publishers national and international</td>
<td>Private Publishers national and international</td>
<td>Public</td>
<td>International Financing and national budget</td>
<td>Loan 136 1/OC-UR (BID)</td>
</tr>
<tr>
<td></td>
<td>Resource Centres Programme.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td>Production and publishing of written and audiovisual education materials</td>
<td>Private Publishers</td>
<td>Private Publishers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>into indigenous languages and bilingual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Introduction

Equal access to basic education is a key educational policy of most countries, whether rich or poor. Therefore, textbooks should also be expected to be available for all. In developing countries, textbooks are, with the help of the teacher, the primary means for the transfer of knowledge and skills; they may also be the only source of information about the curriculum for the teacher, the only books available in the average child’s household, and the main source of reading.

The process of textbook development begins with the formulation of the needs of the student and of society, and ends with the student’s use of the book, inside or outside the classroom. In between, there are many stages: curriculum development and authorisation, identification and commissioning of authors, drafting and revising of a manuscript, preparation of illustrations, evaluation by the publisher in field tests, evaluation by the Ministry of Education, revision, further evaluation, production (involving typesetting, printing and binding) and finally shipping to government warehouses or retail outlets. In addition, a ‘literate community’ and dynamic interdependence between general and educational publishing are necessary for sustainable textbook provision.

Processes in textbook development

1. Planning, policy and management

Efficient textbook provision requires accurate and timely information. Many planning and policy issues must be examined in detail before preparing new textbooks, such as: the selection of subjects requiring textbooks; the use of national and local languages in instruction and textbooks; the timing of curriculum reforms and revisions; rewards for authors; the target textbook to pupil ratios if textbooks are provided by the state; technical specifications for paper, printing and binding; procedures for evaluation and authorisation of textbooks by the ministry of education that are objective, thorough, comprehensive, fair, timely, concerned with social content and in the public interest; affordable and sustainable financing; open competitive bidding for printing and publishing; practical and cost-effective distribution; professional development for publishing personnel and educators; identification and provision of supplementary reading and other learning materials, including their development, publication, distribution and financing; support for public and school libraries; and positive industrial policies affecting publishing.

2. Models for textbook development

In some countries such as Jordan or Sri Lanka, ministries of education have their own textbook publishing units. These are responsible for the production of all textbooks with little or no reference to
local or private publishers.

Under the old system of the former Soviet Union and other Eastern European countries, specific publishers were set up to serve different ministries. With the fall of communism, these houses have gone bankrupt, been privatised or been restructured to be financially self-supporting. Other private publishers have established themselves. Most countries of the former communist bloc have espoused a free market system for textbook development.

Indeed, across the world, recent policy trends for textbook development have included governmental decentralisation and market liberalisation. In all industrial democracies, the role of developing, producing and distributing textbooks belongs to private industry, while the role of the government is to prepare clear and detailed curriculum guidelines; to make them available for the development of textbooks; to establish an objective process of evaluation and authorisation of textbooks; to decide the channels to be used in funding and distributing textbooks to the schools; to set minimum physical standards of production; to perform the same functions with respect to other learning materials; and to protect intellectual property rights through appropriate legislation. The state may also be expected to support libraries and promote literacy through community-based campaigns.

In these countries, the ‘standard’ process of textbook development is for ministries to issue syllabi and curriculum guidelines and then to invite submissions by a given date, either in the form of manuscripts or designed and illustrated books or book samples. Following evaluation and revision, one or more texts are selected for each subject and either purchased by the ministry or allowed to be presented to schools for adoption and purchase either by the school or the parent.

3. Textbook evaluation

As mentioned above, in many countries, new textbooks have to pass through an evaluation and approval process before they are allowed to be used in schools. Some German local authorities operate rigorous systems of evaluation and testing before materials can be used in schools; publishers are required to pilot whole sections or year’s worth of a new textbook in selected schools before approval is given. In the province of Québec, Canada, foreign language textbooks need to pass through five separate evaluation panels including pedagogy, equal opportunities, anti sexism and racism, etc.

In systems with multiple choices of textbooks, there have been complaints about the process of evaluation. In Kenya, the government was accused of favouring the former state publishing house; in Romania, officials in the educational system are free to become authors of competing textbooks, leading to concerns about conflict of interest and influence over subordinates. In the Philippines, publishers complained about inconsistency in appraisal: according to one, some books won conditional approval, even though they did not cover all of the required curriculum, while others were rejected over an illustration or exercise.

4. Textbook choice

The multiple book option implies multiple sources of supply and an abandonment of monopoly in many cases. It also implies releasing control and empowering the teacher with adoption decisions. It may also lead to greater complexity and higher costs and problems with teacher training.

5. Textbook manufacture and distribution
When the publishing of textbooks is the responsibility of private publishers, the functions of manufacture and distribution (which includes marketing and order fulfilment) are integrated; the publisher commissions the printing and arranges the supply route usually through the local book shop or distributor. In the case of ministry-led supply of textbooks, the manufacturing process is normally tendered to either state or private printers and the subsequent distribution to schools undertaken by a distribution agency, or the local education offices. Whether it is carried out by the state or the private sector, distribution will be a continuing problem in many countries, as it will always be arduous and expensive to reach remote areas, and distribution mechanisms both by the state and the private sector face many hurdles.

**Recommendations**

*The role of the state*

In countries where state institutions wrote, produced and distributed a single textbook for each subject and level, the textbook provision systems have generally been found to be ineffective. The private sector has proven to be more efficient in the domains of textbook writing, production and distribution; thus, the role of the state should be to ensure quality and to moderate inequities.

*Curriculum*

An ordered cycle of curriculum renewal is essential to the economical revision and replacement of new textbooks. While innovation in curricula is necessary to introduce new learning and methodology, abrupt or frequent changes can throw the textbook provision system into disarray and discourage publishers from investing in textbook development.

*Language policy*

Over the last four decades, evidence has accumulated suggesting that teaching learners in a language they do not understand is not very effective and causes a high incidence of repeating and dropout. Therefore, mother tongue instruction is widely recommended, particularly because the practical difficulties in implementing this kind of instruction can be easily overcome.

*Funding*

Several governments especially in the Former Soviet Union and Eastern Europe have taken out loans in order to supply textbooks to schools on a one-time basis. But how is the borrower to maintain the supply of textbooks into the future after the end of the period covered by the loan? There are three choices: government takes on or reverts to the funding of textbooks from its own resources; parents pay for books; or a national or local textbook rental scheme is introduced.

Textbook rental systems are helpful in ensuring sustainable textbook funding. Although textbooks need to be manufactured to a high standard for their re-use to be practical, textbook management of this kind have proved to be more economical overall than the annual re-supply of cheaply produced books.

*Evaluation*
To evaluate submissions fairly, ministries usually recognise the need to set up independent evaluation boards, which are more accountable than internal committees which may be extensions of their own curriculum departments.

*Information systems*

The efficient provision of books and learning materials requires effective information systems. The potential for change has been demonstrated in Jordan, where an Educational Management Information System (EMIS) was installed beginning in 1990.

*The development of the publishing industry*

In a transition from state monopoly to competition, due attention must be paid to preparing a commercial environment and a level playing field. A favourable environment for commercial publishing requires decentralisation of funds to enable schools to select the textbooks and other resources they want to use and buy; capacity building of new publishers to increase choice of textbooks and competition; an objective and open system for approving textbooks for purchase; training in assessment, selection and purchasing of textbooks for school administrators and teachers; adequate information systems for procurement of textbooks; and effective commercial distribution systems. All the books that are approved must have an equal opportunity to be purchased.

However, single publishers can dominate the market when the state continues to produce textbooks through a commercialised parastatal that may enjoy special benefits. Even when the state withdraws from local publishing, the field will not necessarily be level. If local commercial publishers are unprepared to deliver textbooks in sufficient quantity and quality, transnational publishers will be quick to fill demand.

A national book policy with clear strategies and plans can help to develop the local publishing industry.

*International competition or international co-operation?*

In the context of donor funded initiatives for textbook development, insistence on international competitive bidding can have the detrimental effect of channelling most of the loans for textbooks out of the recipient country, with the ratio of books from local publishers to those from foreign publishers at 1:50.

In contrast, co-operation and co-publishing can speed the transition to sustainable competitive provision of learning materials. Co-operation can occur through the adaptation of a textbook produced in a neighbouring country, or it may be a joint venture between the local publishing house and a well-established house in an industrialised country, involving the transfer of know-how as well as capital.

*References*


At the preparatory stage of the UNESCO textbook programme, a survey was conducted by the management team to identify the complete set of science and mathematics textbooks in use in Iraqi’s primary and secondary schools. The survey on textbooks was conducted over a period of two weeks during which available titles were collected.

During this first phase of the project, a management team was set up to monitor its overall implementation. The team was composed of a project manager (also an expert in printing and textbook production), a curriculum specialist, a training specialist, three international experts in textbook development (hired for a short period specifically for conducting the textbook review), two of whom were mathematics and science specialists, and the third a specialist in textbook revision. The programme team was completed by an international project officer assisted by a secretary, both operating from Paris. Responsibility for the project lay with the Division for the Promotion of Quality Education (ED/PEQ). The implementation of the project on the ground was co-ordinated by a team of national staff in Baghdad, composed of a procurement officer, a logistics co-ordinator, an IT officer, a finance officer, a warehouse/distribution supervisor, two administrative assistants, and two drivers.

**Textbook revision process**

The revision process started with the establishment of a Textbook Advisory Team (three international experts), a Textbook Advisory Council (Iraqi panellists), and a Tripartite Approval Committee, which included the donor agency, UNESCO, and the Iraqi Ministry of Education.

The Council members consisted of an initial group of sixteen Iraqi experts, identified by the Iraqi Ministry of Education; this was later increased to thirty-eight participants. The composition of the panel was heterogeneous and included teachers, education administrators, curriculum developers and school headmasters from Baghdad and the north of Iraq. The members of the Baghdad group were mainly teachers, six of whom were female.

The revision process of the Arabic language textbooks took place in Baghdad from 5 to 25 July 2003. Depending on the security situation, the team met at the UNESCO Office, or in hotel lobbies; movement was very restricted. Following the completion of the review in Baghdad, a similar two-day review was held in Erbil (north of Iraq) on 26 and 27 July for the Kurdish texts. The recommended changes were very minor, as most political bias had been removed in the early 1990s. Apart from the Kurdish members, the group from northern Iraq included representatives of minority groups, namely Assyrian Christians and Turkmans. The session in Erbil aimed mainly at providing the participants with an overview of textbook revision and sensitization to issues such as human rights, and bias in textbooks.
The Iraqi panelists, assembled in Baghdad, were educated in either mathematics or science, and were assigned to working groups according to their respective area of expertise. The teams were thus divided into four major working groups – primary mathematics and science, and secondary mathematics and science; the four groups received support and advice from the three international experts.

The whole revision was conducted according to a set of parameters provided by UNESCO and USAID. They included human rights and fundamental freedoms, culture of peace, gender appropriateness, political neutrality, non-discrimination of religious or ethnic groups, and promoting the protection of the environment. The International Textbook Advisory Council, together with the representatives of local education authorities, agreed to focus mainly on political aspects and to exclude any changes in content which, it was felt, needed to be envisaged in the future by the Ministry of Education in the framework of a comprehensive curriculum reform.

During the review, the content analysis and the appropriate changes were noted on an official sheet, listing all required changes in political content in accordance with the parameters (see Appendixes I and II).

Elements (including text and visuals) that were removed from the textbooks during the process included the following: (a) Ba’athist ideology; (b) Saddam Hussein’s cult of personality; and (c) references that suggest an inequality of the sexes.

Outcome of the revision process

The number of books reviewed and the timeframe exceeded all expectations, as a total of forty-eight titles (see appendix III) were reviewed over a period of ten days (5 to 15 July 2003); the proposed changes were agreed upon and made. According to the international science specialist monitoring the working group on chemistry, biology and physics, the textbook review showed among others that: (a) the photographs and other graphics were unattractive and inadequate from a didactic point of view; (b) in terms of content, science textbooks contained many inconsistencies between the text and the teacher’s lesson – to the point of being methodologically unsound; and (c) many factual errors were present in chemistry and physics textbooks.

Deviation from the ideal course of revision

The revision process itself deviated considerably from the ideal course of textbook revision and review due to the emergency nature of the task. In normal circumstances, textbook revision would entail setting up standards and developing tools for analysis within national and cultural contexts. It would focus on identifying factual errors and obvious prejudices, and would then go on to eliminate the identified errors and prejudicial remarks. The teachers’ methodology and teaching aids used would also be part of the revision process. The main tasks would include: analysis of the texts and design in terms of relevance and level, comparison of findings and formulation of recommendations; ideally, reference books and other instructional materials would be available to the revision teams. It would also be carried out on a longer period and would involve a much larger team.

In a more stable social context, it would have been possible to accomplish these different phases in a more systematic way. However, because of the emergency situation, only an initial review was possible as the project needed to ensure that the books were printed and distributed in time for the beginning of the school year.
Textbook production

Overview of textbook production

In the period prior to the regime change, wars and sanctions had severely affected local printing capacities. Printing paper was lacking because of the embargo, and the inefficiencies of the Ministry of Education’s printing press had resulted in most of the textbooks (approximately 70 per cent) being printed in Amman and only about 30 per cent in Baghdad.

From the beginning of the textbook programme, UNESCO therefore showed commitment to build local capacity and generate local income.

Selection of printers

At the outset of the project, in July 2003, in order to get a full understanding of the printing capacity in Iraq, UNESCO carried out a preliminary survey, which revealed that there were more than 140 printers in Baghdad. Following this survey, all printers were requested to submit company profiles. UNESCO Baghdad received 85 profiles and eliminated 55 because of their insufficient production capacity, and inability to meet the required deadlines.

The second stage involved visiting the thirty printing companies whose profile met the required standards to assess their capacities. This survey was conducted, in Baghdad, by the Programme Manager and the local team. It included pre-press companies specialized in the production of films and CDs, two additional printers in the north of Iraq, and some printers in Amman.

The survey allowed the textbook team to ascertain that 76 per cent of the required printing could be done in Baghdad. It also allowed them to retrieve partially some textbook film and CDs that were scattered among several printers in Baghdad and Amman. As for the other textbooks, it was found that most of them would have to be scanned manually. Indeed, of the thirty-nine book titles selected for printing, only three existed on film, and two on CD.

As regards printing paper, the printers made it clear that they were in a position to procure only cover paper at 250 gsm, but that the 80 gsm paper required for printing the text was not available immediately through local suppliers. This was a major issue as procuring the paper overseas required from six to eight weeks. Fortunately, at that time, information was received that large stocks of paper had survived the looting which followed the fall of Saddam’s regime, and were available in Baghdad in the Ministry of Education’s Zayuna warehouse. Permission was sought and granted from the Ministry of Education (MOE) to use the available stocks, on the condition that they be replaced at a later stage. This was agreed and, given the deteriorating security situation, armed guards were immediately hired and posted, on a 24-hour basis around the warehouse – to prevent further looting of the paper.

Bidding process and establishment of contracts

Following the survey of printers, the UNESCO team in Baghdad initiated a bidding process. The following criteria determined the outcome: (a) substantial responsiveness (mandatory); (b) completeness of offers and required supporting documents; (c) compliance with internationally recognized quality standards; (d) delivery lead-time; (e) price; and (f) the printer’s past performance record.
Because of lack of time, the bidding was confined to printers who fulfilled the following requirements: (a) sheet-fed 4-colour machines, or several 2-colour machines, size 100 X 70 cm; (b) web-fed multi-colour machines; and (c) adequate finishing capacity.

Concerning the textbooks, each title varied in quantity from 420,000 books to the shortest run of 45,000 books, of which most were of size 17 X 24 cm with the exception of four titles which were 21 X 28 cm. The number of pages varied from 320 pages to 120 pages. Most titles were in 4-colour.

With a printing deadline of six weeks, each printer was assessed on the basis of its production capacity, and the titles awarded accordingly. Once titles were allocated to printers, the latter were requested to submit prices based on the cost of one 16-page section printed both sides in 4-colour. By obtaining quotes from all printers on a 16-page section, UNESCO initiated competitive bidding, with the cheapest setting the benchmark. At this stage, the bidding process was standardized, with a costing formula put forward by UNESCO in order to arrive at a price that reflected realistic costing submissions.

All the printers followed the same formula, and it quickly became apparent that collusion was taking place among the majority of the printers in an effort to keep prices high. With a third submission of prices, and a very clear picture taking shape of the collusion, it became apparent that it would be cheaper to print the books outside the country, and rumour quickly spread that UNESCO and UNICEF were considering printing 100 per cent of the books overseas.

Time was at a premium; evacuation of international staff had been decided, due to the bombing of United Nations offices in Baghdad on 19 August 2003, and collusion of the printers’ cartel had to be dealt with. Each printer was met individually and it was carefully explained that unless realistic submissions were made no contracts could be awarded in Baghdad. Several of the printers broke from the cartel and a precedent was set. The price among printers fell from a high of US $0.62 to a low of US $0.375 per 16-page 4-colour section.

Support from Amman procurement and Paris Headquarters proved to be a vital factor in getting the UNESCO Contracts Committee to approve the submitted contracts for nineteen titles to be printed in Baghdad and five in Amman. Efforts were made to secure more contracts in Baghdad but security deteriorated, resulting in the Programme Manager, the only international staff member on the project remaining in Baghdad, being evacuated on 13 September 2003.

Once the first stage of printing was under way, preparations began for the second stage. Approval to print the remaining fifteen titles was still required from the donor and, in the light of the experience from the first stage, approval was sought at a very early stage (3 October 2003), but was still not granted until 17 November 2003.

Planning the second stage was complicated by the onset of Ramadan and the rapid approach of Christmas. Normal competitor bidding due to the above factor became impossible without lengthy delays. It was decided to use the experience gained during the first stage. With a clear picture of the printers’ performance abilities, an improved title allocation was drawn up – with some printers working jointly on the same title. Contract amendments were issued to the original Baghdad and Amman printers following Contracts Committee approval in Paris.

**Production plan**
At the beginning of the printing process, a production plan was established to print all the Arabic books for the centre and south, and allocated quantities for the three northern governorates.

As mentioned in the Introduction, the printing production process was planned in two stages: September to November 2003 and December 2003 to March 2004. During the first stage, it was planned to produce 5.2 million textbooks. As the funds available did not allow UNESCO to print 100 per cent of the books required nationwide for all titles, the plan was to improve on the existing situation. Thus, the book/student ratio – which was as low as 1 : 4 in the north, centre and south – was improved to 1 : 2 students in grades 1–5 and 7–8, and 1 : 1 in the examination grades of the primary and secondary cycles, namely grades 6, 9 and 12.

Between 20 and 31 August 2003, contracts were drawn up with Baghdad and Amman printers for the production of the first stage of printing – covering mathematics, physics and science (part 1) textbooks. This first stage included the printing of nineteen titles in Baghdad (fifteen contracts drawn up with twenty-two printers, with some working in pairs), and five remaining titles (four printers) in Amman.

During the first stage of printing, 5,597,000 books were produced, of which 76 per cent were printed in Baghdad.

At the end of December, the second stage of printing was started; this included the remaining titles in biology, chemistry and science (part 2). Fifteen titles were printed, of which eleven were awarded to the original Baghdad printers and four to the Amman printers.

During this second stage, an additional 3,162,000 textbooks were produced, bringing the total to 8,759,000, against an original agreed number of 5 million.

**Printing process**

Of the forty-eight titles reviewed in Baghdad, only thirty-nine were printed (twenty-four during the first stage, and fifteen during the second). Two titles were not approved for printing by USAID, and the mathematics activity books were not given priority by the MOE.

Regarding the books reviewed in the north, which were not part of the printing plan, those titles were reprinted with ‘Oil for Food’ funds, without any changes made to the text, due to the lack of time and preliminary revisions already made by the Kurdish MOE in previous years.

The scanning process preceding the printing process took place in July/August for the first stage, and from 30 November to 31 December 2003 for the second stage, using all five local companies for all scanning and corrections, as advised by the Textbook Advisory Team. A Quality Control Team was set up to monitor the scanning process that, even under time pressure, took one whole month. Chosen from qualified Ministry personnel, formerly employed by the now destroyed MOE printing press, the quality control team was put in place to approve production, monitor quality and report to UNESCO any issues that might arise to delay production.

Four teams of two people were created, each team being allocated responsibility to monitor four printers (see Appendix V) in geographical locations close to their homes, and to provide regular reports to the project team. At that time, communications within and outside Iraq were confined entirely to the use of the American-supplied MCI mobile phones. The quality of these calls was dependent on
the geographical location in Baghdad of the receiver, and cuts were frequent; a request was made to USAID for more MCIs but the phone system was already overloaded.

The Quality Control Team proved to be invaluable in the first stage of printing, and all the members were kept on to carry out the same duties in the second stage.

The constant reporting and supply of information from the team leader, closely co-ordinated by the project team, allowed UNESCO national staff to put together regular progress reports that were required on a day-to-day basis (several times during the day on some occasions), during the early stages of the project, where information on printing and distribution were vital for all parties concerned (see final progress sheets for both stages of printing – Appendixes VI and VII).

Textbook distribution

Overview of textbook distribution

Currently in Iraq, the distribution and storage facilities around the country are in a state of disrepair, due to the recent conflict and the effect of prolonged international isolation. The previous system in place during Saddam Hussein’s regime was centralized, with all new books being stored in a warehouse in Baghdad now totally burned down.

In the past, representatives from governorates used to turn up from time to time in Baghdad and, if some books were ready, they would take them and store them in their own warehouses for the one major pick-up by headmasters at the beginning of each school year in September. There was also a smaller-scale pick-up in January for books that made up ‘part two’ of any given title allocated for use in the second semester. There was thus no systematized planning for carrying out the textbooks distribution under the previous regime.

Planning the distribution process

To remedy this situation and replace the burned down warehouse, in July 2003, the Textbooks Programme established a distribution centre in Baghdad at the central paper warehouse (Zayuna Warehouse), which could accommodate as many as 600,000 textbooks. The warehouse was cleaned, equipped with power and office equipment, and a computerized system put in place to allow close monitoring of distribution.

In order to plan the distribution process, the UNESCO team conducted an initial survey of the capacity of the warehouses in the Governorates at the beginning of the project. This survey revealed that the heavily centralized system was very inefficient, and that it would be important to consider transferring responsibility for distribution to the district level.

This survey showed also that many warehouses were in serious need of refurbishment. The project originally envisaged repairing some of the warehouses, namely those in Basrah, Ninewah and Saladin governorates. However, due to insecurity and the evacuation of all international staff in August/September 2003, it was impossible to carry out these repairs.

To get a clearer understanding of the situation prevailing in the governorates, UNESCO convened a meeting of Directors and warehouse managers of all eighteen governorates in August 2003, in the
UNESCO office in Baghdad. During this meeting, several issues were discussed and important agreements reached regarding the forthcoming textbook production and distribution.

One of the issues discussed was the financial requirement for getting the schoolbooks from Baghdad to the governorates and from the governorates to the schools and establishing an adequate time schedule for the distribution. Submissions were also made of the school enrolments for 2002/2003 grade by grade, which included estimations of the projected population increase. Whilst it was noted that many figures were rounded off upwards, they were taken to be closer to reality than the sample survey carried out by UNICEF at an earlier stage (see Appendix IX-A and IX-B). This was important for ensuring that books actually reached learners.

Regarding the issue of transportation, there was general agreement that private transport should be used for the transportation of the books from Baghdad to the governorates as it was reported that the Department of Education trucks were either completely destroyed or in very poor condition.

It was also agreed that the headmasters would continue to pick up the books from the Governorate Education Office and that they would be paid by UNESCO for the transportation costs based on data supplied by the governorates.

After the meeting in Baghdad, each governorate director was requested to return home and complete a basic questionnaire in an effort to assess the true financial needs of each governorate (see Appendix VIII).

The financial submissions for costs borne by the headmasters when picking up their books varied greatly from Basrah, requesting US $45 per school, and Tameen, requesting US $0.56. Based on research and discussions, it was recommended that an average of US $18.00 per school per pick-up for rural areas, and US $5 for urban areas be established, and that the amount be made available in Baghdad for all the governorates.

Due to lack of time and mounting pressures to perform, at that time UNESCO was not able to pinpoint accurately distribution costs based on the distance of the school from the governorate education office, number of books to be picked up, and number of trips to be made. The need for the above information was met when the headmasters completed the questionnaire distributed with the books (see Appendix IV), and it is hoped that the information collected will be useful for the MOE in the future.

For the first stage, distribution to the governorates started on 21 October 2003, and was completed in three batches by 19 November 2003. In the case of all governorates, textbooks were delivered thanks to the availability of private trucking contractors. The second stage distribution began on 28 January 2004, and was completed governorate by governorate by 16 February 2004.

Both stages of distribution were highly computerized. The printers were all clearly informed about the delivery quantities they had to deliver to Zayuna and directly to the four Baghdad directorates (see Appendix X). The governorates were also clearly informed about the quantities of books to expect (see Appendix XI). Progress of distribution to the governorates and Baghdad directorates are provided in Appendixes XII to XV.
No governorate reported lack of funds and, in the case of Ninewah, a sum of US $4,000 was returned to UNESCO. Ninewah, the governorate with the largest number of schools, could in future be relied upon to get realistic facts and figures when planning distribution.

As the second stage distribution coincided with the distribution of the UNICEF books, it was not necessary to supply the governorates with further funding with the result that savings of US $210,000 were made. UNICEF made similar savings by using UNESCO’s facilities in the first stage of distribution.

**Monitoring of distribution**

Another component of the textbook programme was monitoring distribution. Monitoring mechanisms were put in place to ensure efficient distribution of the books to the governorates and then to the schools, keeping an established and accurate tracking of the delivery process.

These mechanisms included the setting up of a monitoring team, distribution of questionnaires to school headmasters to collect reliable information on school locations and the process of book distribution, and a proper receipting system.

The monitoring team, set up in September 2003, was composed of fourteen MOE staff members, whose main task was to monitor distribution at governorate and school level. The team operated until January 2004, with sporadic monitoring continuing into May.

Their task involved collecting the questionnaires filled out by the headmasters (see Appendix IV), together with the signed receipt confirming the pick-up of the allocated share of books, and payment received for carrying the books from the governorate warehouse to the school. The monitoring task included also a full survey of all titles remaining in the centre/south warehouses as preparation for the printing planning for the school year 2004/2005.

The results of the nationwide warehouse survey (see sample survey sheet for Diyala in Appendix XVI) were complete and comprehensive, and it was proposed to adjust the print run for the new school year accordingly. Even though all the data were made available to the MOE, and large savings could be made, the information was not utilized.

Despite the increasing insecurity in the country and the lack of adequate incentives (which at times discouraged some of the MOE warehouse staff from working), 100 per cent of the textbooks reached the governorates and schools.
Revision of Iraqi mathematics books in Arabic,
Baghdad, July 2003

Extracts from the report on textbook review (Stoeber et al.) as per parameters provided by UNESCO & USAID:

Political content

All references by and to the former regime have been eliminated.

The review group originally decided to eliminate the phrase “Allahu Akbar” from the Iraqi flag, which was introduced by Saddam Hussein personally. However, the experts decided finally against it as it was felt that this question might have political ramifications, and that this matter will have to be decided by a new government.

Images of the flag are to be found in: Math Grade 7, page 9 and Math 8 Activity, page 16.

A district map of Iraq is to be found in Math Grade 6, p. 100 and Math Grade 7, p. 141. As the district boundaries and their political status will presumably not be changed before a new constitution is released and no foreign territories are included: no objection.

Violence

Obvious references encouraging violence have been eliminated, together with any political content. Discriminatory statements against other ethnic, religious etc. groups:

Not present in math books, apart from the eliminated political statements.

Gender appropriateness

Both sexes are referred to in the books. Obvious discrimination is not present, apart from the reference to the Islamic rule of inheritance (see below). Any further improvement cannot be done by eliminating text. This must to be left to a new generation of Iraqi textbooks, after the reform of the curricula.

Religious content

Math books for grades 1, 2, 4, 8, 9 and 11 arts and activity books for grades 1 to 5 and 8 are without religious content.

In the following cases, references to the Islamic religion are present, but can be justified:

**Math Grade 3**
Page 110: second activity
“A student makes four genuflections in each prayer, how many genuflections does he make for three prayers. “

**Math Grade 5**
Page 110: exercise 2
“Ali spends 1/5 of an hour for prayer and Ahmad spends 1/6 of an hour. Who spends more time?”

Page 129: exercise 2
“The length of the mosque is 23 m and 70 cm. Rewrite the length in a decimal form.”

Page 150: exercise 3
“Khalid is 115 steps away from a mosque. If a step is 0.45 m, how many meters away is he from the mosque.”

For didactic reasons, the transfer of formal mathematics into life-specific contexts seems highly desirable. These exercises are everyday life applications of math concepts in the context of a Muslim society. They are not discriminatory. Therefore they should be kept.

**Math Grade 6**
Page 128:
Quotation from the Holy Hadith: “Learning is a must for each Muslim, male or female.”
This hadith is not discriminatory from the religious or gender standpoint. Given that Iraq is a predominantly Islamic country, making use of these traditions to promote learning for everybody is not to be criticized.

**Math Grade 7**
Pages 132 -139
Sections 1 and 2 of Chapter 5 discuss fractions and percents referring to Zakat and Islamic heritage rules. The chapter is introduced by a quotation from the Holy Quran (part of Sura).

These two topics are taught as everyday life applications throughout the Arab world. The Sura refers to the relevant regulations (Zakat and Islamic inheritance rules), which are relevant in the context of this chapter.

Page 186
Arabic calligraphy of the words “Bismillah ir-Rahman ir-Rahim” as an introduction to the concept of mirror reflection.

The example is a very good one based in the cultural context of the country. Therefore no objection!

**Grade 7 Activity**
Pages 44 and 68
The Sura and the calligraphy mentioned in Math Grade 7 are reproduced in the activity book. The same justification can be applied here.

Math Grade 10
Math Grade 11 Science
Math Grade 12 Science and Math Grade 12 Arts: Preface starts with “Bismillah ir-Rahman ir-Rahim”

This expression is used extensively in the Arab world as an introductory remark. In a short version, “bismillah”, it is also used by Christians. Thus it is generally accepted within the society, and even expected in important cases.
Introduction

The affirmation that present-day society is living in the civilisation of information technologies is not new. Because of this new civilisation, humankind is, in a sense, living in different way in every aspect of life.

Although it is not completely true that society has experimented unprecedented changes, the last twenty years can be regarded as the time when a series of thoughts has been put into practice, thoughts perhaps developed in previous decades.

Considered globally, the history of humankind has developed three great civilisations (Gago Bohórquez, 2000), dominated and characterised by one technology and different social problems, exploitations, human values, professional and social struggles and ways of considering, approaching and producing information and knowledge.

These three great civilisations are the following: the civilisation of agriculture, the longest; the civilisation on industry, the most socially concerned and the civilisation of information technologies, which is not that of knowledge since the latter is more ideal and pretended while the former is more available and refers only to what has to do with information by itself.

Leaving aside the first two civilisations, within the information technologies, the working object is modelled with an additional element: information itself, an element which, for many, is the centre of a series of justifications in which other elements seem to be forgotten to a certain extent.

On the side of knowledge, the specialised knowledge for the identification and resolution of problems is what is most demanded. Since the production of knowledge is not a global phenomenon, knowledge companies are obliged to have access to the global intelligence and the new key for the techno-economical paradigm is based more and more in the information technologies, perhaps, newer and newer every time.

Every aspect of the cultural, economical, personal and social life has been affected by the apparition of these new ways of understanding life through incessant flows of information, through new pretended knowledge itineraries and without lessening the importance of the new ways of tackling information knowledge and its problems. In this sense, the way the curriculum is understood has been also altered, just at the moment when new ways of connecting information, creating and developing the school curriculum at the service of how the world is understood nowadays, is beginning to be accepted.
Up-to-date meanings for information and knowledge

Increasingly, less and less profits are obtained from the traditional sources: land, work and money. The main producers of wealth are information and knowledge. Present-day societies are witnessing fundamental changes in the way of producing the scientific, social and cultural knowledge. A new manner of producing knowledge and a new consideration of the volume and value given to information are substituting or reforming the established institutions, disciplines, practices and policies.

Within the way of producing knowledge, there are two concepts which particularly describe certain manifestations of postmodernity: the homogeneous and the heterogeneous ones. In this sense, the new way of producing knowledge is heterogeneous in relation with the skills and experience that people provide.

For instance, the composition of a team for the solution of a problem changes with time and the requirements evolve. People gather in temporal teams and networks, which disappear once the problem has been solved or redefined. The members can, then, gather in different groups with different people and often in different places to tackle different problems. This is not planned or coordinated with a central group.

Perhaps, this is why in the educational processes, in the respective designed didactic programmes and in the use of electronic information technologies, interdisciplinary and transdisciplinary approaches, knowledge integration, co-operative knowledge and cohesion elements are so important.

As for the heterogeneous way of producing knowledge is concerned, it involves a model of growing density of communication (Gibbons et alii, 1997), when the origin of this heterogeneous growth is found in three communication levels:

1. Communication between science and society.
2. Communication between scientists.
3. Communication between entities of the physical and social worlds.

Regarding our contact with educational centres, one of the most problematic topics is knowledge and, of course, its close relation with teaching and learning. One cannot leave this topic aside, since an analysis of it is always necessary and specially taking into account the vertiginous rapidity and fragility of most present-day knowledge.

School has always suffered a pursuit and an unconditional support. One conclusion can be obtained: modern society, the society of information, cannot get rid of schools or what is done there, at least, until the present moment.

This perspective of information and knowledge has a vital importance not only for education. Society also, through the agents who are related to knowledge, is trying to give place to what the flowing information, absolute or restricted, could provide as final and mediational elements for a high development.

In this sense, the present time has been regarded by many experts as the time of knowledge and/or information (González Requena, 1988; Iglesias, 1990; Barnett, 1997; Commission for the European Communities, 1997, among others), but not considering them as equivalent terms. R. Barnett himself says that the world is suffering deep social, economical, epistemic, technological and
cultural changes, from which two general considerations can be extracted (Barnett, 1997: 22 and following):

On the one hand, the affirmation that the world is now understood as not knowable. Our own knowledge systems and technologies are producing a reflexive change in which what is produced is the motor for new changes. That is why this reflexive element is on the link between knowledge and that change which is produced faster and faster every time, provoking a changing situation essentially unknowable.

On the other hand, the reflection built by our knowledge systems have repercussions in the individual level. The growing levels of satisfaction about concepts, ideas, and, of course, discourses, need individuals if they give sense to the world they are facing. That is why that reflection at the individual level – that is, the critical capacity of asking oneself about the universe that surrounds us - is a necessity to assimilate and settle the new order down.

The consequences of this new objective are the deep transformations that the world is fostering in its development. In this sense and because knowledge plays a preponderant role, and is the basis and goal, Science, technology, their connections with learning and teaching, and of course, the introduction of elements and mediational processes in educational centres, should be discussed in a place where there should be space, time and authority for these questions, logically exposed in the proper representation levels.

This idea takes us to the problem of knowledge, and, perhaps, of information, when it arrives to the educational centres.

The problems about knowledge, at this moment, are in the centre of the new educational necessities and of a changing reality, a scene in which the role of the media have a fundamental position since these new media, who provide new ways of learning do no situate neutrality on their point of departure and accept the bifurcation of future reality into the wider frame of the personal and social uses that humankind is eager to build around the new technologies, under the protection of the new ways of understanding the emerging didactic plans.

New ways of producing and managing knowledge

Our time is changeable, values, meanings, syntheses, are born and die in less than a decade. And when conceptions change, also the systems of government, of family, of cohabitation, of belief, of compromise, change. There is no human activity in which changes do not incessantly appear and disappear, dissolution and confinement are unrestrainable. Even more, at this moment of history, this phenomenon, which always seems to be a novelty because we always want to cling to it from the present, seems to be characteristic of history, varying only the rhythm. This means that the pace of the changes has become as big as well as unusual. It seems as if a feeling of sticking to the “change for the change” had attacked mankind.

Nevertheless, one cannot believe in the absoluteness of this idea. The change for the change has no sense, it can become antipedagogical. The total attraction for the new may result in the disintegration of the human personality.

This happens with the concept and the scope of so many things which were considered fundamental, and when taking into account their development in the western countries, were also judged as untouchable. For instance, authority, family, human relationships, the ways of understanding
education, etc. Old categories are regarded as invalid if they are not able of recovering from their criticism, despite the fact that many of them have shown themselves to be the best allies of humankind.

However, one must not think that humans are dominated by an anarchical spirit. On the contrary, they believe everything which can be verified and with sense, as the expression of modernity, although it also admits everything as valid in search of a new paradigm which combines elements from every aspect in a sort of globalisation and heterogeneity which drives it to a “third culture” as a qualitative new phenomenon. We live in Postmodernity.

Under this view, present-day society is criticised not because of its realisations and relative success, but because it is accused of not being able to fulfil certain fundamental aspirations: liberty, self-expression, self-development, etc.

In this sense, progress becomes an accumulation of new possibilities developed by a series of permanent crises, and that is why one understands as a palpable reality that future is at our reach if we understand that the technological revolution is the main factor of the social change, although not the only one.

A non-stop advance which tries to follow the way opened by technology, in which electronics and its application in computer sciences play an important role. Not in vain has this time been called telematic, cybernetic (Quintana, 1994), electronic era or technological civilisation, a time characterised by the revolution in the scientific development, because all of us are involved in the uncountable, suggestive and, perhaps, disturbing possibilities of transformation that the technological and scientific development offer to our generation (Calvo Hernando, 1980). Everything takes us to the information and knowledge era.

There is no doubt that many questions arise. One reaches a special importance: the sources of wealth of the future, may not be oil, steel or corn, but will they be the brains, that is, the technical savoir-faire and the scientific spirit, or rather the level of conscience and moral sensibility? This question possesses deep implications in future education and, sociologically, in the contents and ways of producing them, in their relation with information and knowledge. These aspects still work in the same places of the past, but with renewed protagonists, and with a demanding competence between the values which each thing is awarded with.

The scene is constituted, without doubt, by the introduction of a new way of producing knowledge. In educational contexts, certain educational models for the processes of teaching and learning, when, with more or less awareness, involve the dynamics of the production of knowledge, which is more heterogeneous and fragmented involving a model of growing density of communication (Gibbons et al. 1997) are able to seize the new way of producing knowledge and its ways of expression. This not only affects the knowledge produced, but also how it is produced, the context, the way it is organised, the system of rewards that it uses and the mechanisms which control the quality of the product.

An example of this is the fact that the capacity of acquiring information is overtaking the capacity of the traditional techniques to process it, giving place to new fields such as knowledge discovery or data mining. This circumstance must be taken into account in a double way:

On the one hand, taking into account that human knowledge is difficult to represent, due to the
great proportion of implicit knowledge and the complexity of the linguistic description. On the other hand, taking into account that in the sequence: source – data - pre-treatment – data mining- knowledge- permanent training appears as not limited to the years of obligatory or post-obligatory school, but, because of the necessity and present nature of knowledge, training and knowledge itself need to be constantly updated.

Around the characteristics of this new way of production, which authors such as M. Gibbons, C. Limoges, H. Nowotny, Schwartzman, P. Scott and M. Trow (Gibbons et al. 1997) call “Mode 2” in relation with the other more traditional “Mode 1”. The first proof of the creation of a new scene in the consideration of this mode 1 as created in a disciplinary context, fundamentally cognitive, whose ideal should be empirical physics and newtonian mathematics, while knowledge in mode 2 is created in wider social and economic cross-disciplinary contexts.

Mode 1, within what is considered a healthy scientific practice, tries to synthesise in one sentence the cognitive and social rules which must be followed for the production, legitimation and propagation of this kind of knowledge. For many authors, mode 1 is identical to what is understood as science. Its cognitive and social rules determine what will be considered as meaningful problems, who will be allowed to practice science, and what is good science. Those practices who follow the rules are scientific, those who violate them, are not.

Nevertheless, the new way of producing knowledge is giving empirical proofs which indicate that it is creating a characteristic group of cognitive and social practices, different from those of mode 1.

In short, and in an attempt to summarise, one can affirm that in mode 1, problems are exposed and solved in a context dominated by the interests, normally academic, of a specific community (a school or other). On the contrary, mode 2 takes place in a context of application. Mode 1 is disciplinary, mode 2, cross-disciplinary. Mode 1 is homogeneous, mode 2, heterogeneous. From the point of view of organisation, mode 1 is hyerarchical and tends to preserve its form, while mode 2 is heterarchical and transitory. Each mode uses a different way of controlling quality. Compared with mode 1, mode 2 is more responsible socially and more reflexive. It includes an each time larger and more temporal and heterogeneous number of followers, which collaborate over a defined problem, within a specific and localised context.

**Problematic values of knowledge and education**

The new epoch, which has ripened before us, possesses, in a qualitative consideration and not only quantitative, a series of singularities which are worth mentioning.

On the one hand, the frame of present-day epistemological considerations, which, in post-modern times, are based on a radical pessimism. J.F. Lyotard (1981) considers that there is no possible theory because nothing can be generalised, since thought, knowledge, ethics, history, the being, as “evidences of the difference” are always being reconsidered. In this sense, from T. Kuhn’s theory of the paradigms onwards, the demand for a system of sciences gives place to historicity, and then, it opens to its mere verisimilitude.

This new epoch means for the science of knowledge what has been called “investigation traditions” (L. Laudan) or “epistemological anarchism” (P. Feyerabend) (Díaz, 1990), which can be partially translated in the educational sector as a scheme of tolerance for the diversity of representations of teaching and learning. The question of value has not been introduced yet, but, in case it was
introduced, it would mean to question the validity of these different representations of the analysis of the processes of teaching and learning.

Joshua and Dupin (1993) treat this topic regarding the teaching-learning processes as part of a complex structure, not lineal, which supposes the gathering of three logics: the teacher’s logic, the student’s logic and the subject’s logic. The characteristics of these logics and the interaction between them will give structure to the teaching-learning processes and will characterise the kind of curriculum involved.

Despite recognising these three parts and the new realities which appear after their interrelation, and admitting that it comes from a constructivist conception of the curriculum, this tridimensional view possesses a certain tinge of despotism and dogmatism and creates the following problematic situations:

1. The problem of originality. Many experts and teachers think that constructivism is the last novelty of the “science of teaching and learning” and that it has nothing to do with the past, whose most meaningful elements are connected to conservatism, tradition, authority and, to a certain extent, what is reactionary.

2. The consideration of the ultimate paradigm. The initial problem makes many experts think that constructivism is the last and ultimate theory. The last jump has been done, the last paradigmatic revolution is over, not only in quantity but also in quality. There is no future, there is nothing beyond constructivism.

Another important question which the global analysis of the educational systems is that they do not usually separate themselves from the consideration of the obsolescence of knowledge and its impact in the curricula and programmes (Tunnermann, 1996).

This question can be understood by studying the problem, whose origin is the evaluation of knowledge from the different institutions which generate knowledge and information, including the universities, and by admitting that the new paradigms that appear coexist in a minimal and fragmentary unity of tolerance.

The new demands to the systems of education correspond with a series of elements which need to be analysed critically:

a) Changes in the structure of learning.
b) Changes in the traditional ways of organising, dividing and specialising knowledge.
c) Changes in the circulation of knowledge and in the way it is appropriated.
d) Changes in the social roles of the professions.

These changes has provoked a situation in which teachers and pupils are immersed, but in which they do not find any support. Teachers, the key for the generation and spreading of knowledge, present in their personal dimension, several realities which cannot be ascribed to the purely technodidactic.

Thus, it is probably forgotten, and only as one of the fundamental elements, that when these new realities arrive to educational centres, they find teenagers and young people whose most complex psychological attribute is their ethical sense (Kelly, 1982) and whose most outstanding feature is their emotional development, an attempt to establish a fruitful synthesis between their interior arrangements for their own understanding and the exterior arrangement, for their social integration. It is in these people where it is supposed that reflection and abstract thinking takes place. In a
time of affective conquest of the world, the changes and transformations mentioned need to be explained and expressed by and with the most relevant social measures: mediation must be meaningful and personal.

Learning and knowledge, although not leaving behind what information means, are two terms situated at the core of this idea, although there are some differences between them which make some authors such as J.F. Lyotard (1994) to choose the first. He considers that knowledge is the group of sentences which denote or describe objects, rejecting any other sentence and with the feature, in addition, that they are bound to be declared true or false.

Learning, on the contrary, is beyond that characterisation. It refers to a competence which surpasses the determination and application of criteria of truth and which is extended to the criteria of efficiency (technical qualification), justice and/or happiness (ethical learning), sound or chromatic beauty (auditory or visual sensibility), etc. Learning alludes to a group of competencies and, especially, to the subject that realises it: the wise person.

For Mollis (1994), this process followed a somewhat unusual way in which “learning distanced itself from the subject which possessed it, it was mediatised by writing, accumulated out of the individuals, was mobilised and its confrontations were made through the books. The old spontaneous practices were organised and institutionalised, the spaces in which learning was distributed were limited and fixed, the institutions where organised learning were specialised, sheltered and spread, were invented” (Mollis, 1994: 181).

And all this patrimonial learning, with the arrival of a high technological economy and the necessity of constantly develop it in order to survive in such a competitive world market, has tacked from above – decisions of the educational administrations, university policies, what finally reaches students and teachers- in the reconsideration of a series of functions. This is creating a highly technocratic and utilitarian orientation, an extremely strict conception of learning and knowledge.

High technology, continuous development and vertiginous change in constant evolution, this a complex external reality. And learning, the new conscience industry and knowledge are committed to all of this, a plan which suggests a new cognitive society, a flattering future to knowledge.

In many sectors, the paths that knowledge and learning are taking and the scene to which they are exposed coincide with the objective of developing education and training along the whole life, that is, the expression of the will of promoting the highest level of knowledge possible through a wide access to education, an integrated education, which is continuously updated and in which the most used social mass media are integrated.

Commonly, three main dimensions refer to the integration and updating of what is called in Europe and other places “the society of knowledge”. They are the following:

In relation with knowledge, in order to participate actively in the transformations which are taking place citizens will make their knowledge evolve permanently, so that they will increase and will be renewed constantly.

In relation with citizenship, this means an enrichment of the citizens since common values will be shared and a feeling of belonging to a common social and cultural space will develop.
In relation with abilities, the development of attitudes for work through the acquisition of the abilities which turn to be necessary due to the evolution of work and its organisation. This means that, now, more than ever, it is fundamental to foster, along the whole life, creativity, flexibility, adaptability and the ability to teach how to learn and solve problems. These abilities are related to the new knowledge and the perspectives about it, and also, with the introduction of the mass media in educational centres, although, this may be done through the use that teachers make of them. Following these premises, the gap between qualifications can be avoided.

The final step in these three dimensions of international concern seems to be the necessity of introducing intensively the new technologies of information and communication, in order to have satisfactory results in relation to what was planned.

These attempts show, deep down, the fact that education and learning are not exclusive of educational centres, but also of other learning centres, in which genuine educational activities take place, such as vocational training centres, cultural organisations (museums, theatres, cinemas, bookshops, etc.) and youth associations.

It is now when what Jerez Mir points out is worth mentioning: the new industry of knowledge and, of course, conscience (of information, of entertainment, etc.) with its growing dominance of the simple logic of the image and of the emotional opinion and persuasion in the big mass media, could foster the phenomenon contrary to what would be profitable: it could create a situation in which effort had no sense or it would be a banal reality with little value, it could promote purely iconic stories, weak and fragmentary thoughts and an uncritical eclecticism.

This fact, which has pushed down the barriers of the educational centres and which survives as modus vivendi, is what make people ignore systematically the highest products of the human culture. Intellectual culture is trivialised and notoriety, fame and leadership are assigned whimsically. The social order is legitimised through its continuous spectacular representation, the spreading of fashionable commonplaces and clichés and the active stimulation of the emotional identification with this social order (Jerez Mir, 1997: 147).

This is a serious problem which shows a double consequence in educational centres: the cognitive and emotional transformation of students and, in some cases, the dynamism of certain values of teaching.

For Barnett (1997), these levels of incoherence have several manifestations: On the one hand, there is a certain incoherence with the suggestions, with the different and conflictive messages that take place in schools (the role of the media which channel and create information and the insertion of this information in the mass media is not merely tangential here). An example is produced when this question is asked: will teachers centre their work of the specific results and abilities acquired by the students or will they centre on the generic abilities transferred within the curricular system? There is no doubt that the introduction of the mass media induces to take one or the other possibility.

This question refers clearly to the learning strategies used, the scientific and implicit theories maintained and the introduction of certain curricular media and coherent resources with the plan adopted before. All this creates a determined didactic and pedagogical strategy which ends laying the foundations of the above mentioned incoherence.

On the other hand, there is an incoherence in the answers, in which the innovations with
theoretical or even empirical and medial supports have little incidence, because every depends on the introduction of the media and the use teachers make of them. That is to say, is the curriculum based on the processes or on the results? This is related to those two bipolar didactic plans; one which is based on “what is taking place”, previously to the effects; or at the other end, one based on what has to occur, referring to processes or results, which have to be taken care of indistinctly. There is also the approach which maintains the medio virtus, perhaps less marked than the bipolarity above mentioned.

For Barnett (1997), these questions present greater evidence in a series of signs even more tangible in practice.

First, there is the possibility of the existence of incoherence in the “discourse”. Notions and fields such as work, ability and efficiency intersect with difficulty with others such as being conscious, dialogue and ethical responsibility. In order to introduce an explanation to this topic, J. Habermas’s theory of “the constitutive interests of knowledge” could be used, in which not only the fundamental human interests takes us to what is practical or technical, but also what is emancipatory: this cognitive interest could be defined as a fundamental interest for emancipation and for giving power for compromising in autonomous actions which emerge from authentic and critical intuitions of a social construction of human life. For Habermas, emancipation is identified with autonomy and also with responsibility.

Second, there is a gap and a contradiction between the concept of the curriculum as a number or pre-designed experiences given to students, and a curriculum as a number of experiences created and structured by the students themselves. Then, the questions about the consideration of the environment are determinant and the question, although apparently simple, is: are certain mass media more effective than text books?

A possible way to approach this issue is establishing relation between determined cognitive constructs which support certain aspects of the learning process such as “processing levels”, “mental effort”, or “cognitive maps” and the representational codes used by certain media. Then, the incidence of the mass media in teaching could be analysed.

Third, there is the incoherence in the subjacent philosophy, which stands tacit. This question could be asked: which educational objectives should be developed? The presence of this incoherence in relation with the goals education tries to reach, make everyone related to the educational centres ask the following questions: what should school prepare students for? Should it train the student with a mental development for a conversational initiation to the academic disciplines in the sense that they would acquire the academic objectives of the institution, which are normally very far from social life and its necessities, or should it contribute to the students’ personal realisation (in which a language of the being, of the world, of a critical and autonomous distance would be of great help)?

The same questions have been debated by other authors (González Requena, 1988; Postman, 1988, Iglesias, 1990; Ramsden, 1996; Tunnermann, 1996) who introduce interesting notions such as understanding. For Paul Ramsden (1996), the vital abilities of academic disciplines are based on understanding.

Ramsden (1996) understands this concept as the way students seize and discern the phenomena related to a subject, rather than what students know those phenomena, or how they
manipulate them. In this sense, many students may have formulas, more and more sophisticated every time, in which, by a balance between cognitive and corporal abilities, they reproduce the memorised knowledge from a book without understanding the subject, or they may watch a television programme or a cultural or didactic video not seizing the message it contains. Then, new ways of knowing are alluded, where what is memorised and conceptual gives place to what is ephemeral, versatile and illusory.

To be able to repeat information, whose origin may be a paper, a film or a compact disk is no evidence of a change of understanding; this is one of the most outstanding differences between knowledge and information.

The result of the problems created by the interrelation between knowledge, teaching and comprehension, forms part of many teachers’ *modus operandi* based on the theory that students will learn if teachers transmit information to them or make them work in practice classes or seminars. The use of the media as information channels remains in the sector of what is purely motivational without asking if it has a true relation with knowledge. Then, without such justification, the sequence teacher – transmission – information is linked to the sequence student – reception – knowledge, although the teacher, many times, is not sure that this relation is true.

Then, it is irrelevant if the information comes from oral speech - from a classic point of view-, the teacher is the source of information, or if the source is another, like the mass media, because a passive model is on the basis of the generation and provision of this “knowledge”. In this sense, what is important is not the production of knowledge, nor the responsible management of it, but the accumulation of information.

It is not surprising to see that the improvement of learning is often seen as a process of acquisition of certain skills (how to tackle different kinds of reading, how to work in small groups, how to use computers, how to pass examinations, etc.), the student admitting certain objectives which do not coincide with his/her personal ones but with those of the institution. This is a kind of education centred on basic and specific skills which answer determined necessities, which serve the institution and not the people.

In this sense, Ramsden (1996) thinks that effective teaching is not about teaching this kind of theories, because for him, these theories are accepted with relative ease. Effective learning is about understanding how to use these skills and techniques, which means to have a constant practice and reflection. And these last ones are only useful if students are directed to a clear conscience of principles of an educational character, specially, the principle that contents are previous to the teaching methods for those contents. Only this way they will be aware of the research process in which they have to be immersed.

With this, a key moment of the problems about knowledge arises, the vision about contents and methods, or, in other words, what contents and methods are the most adequate to develop in educational centres? There is nothing left for the question itself to acquire a determined position within the issue raised.

On the other hand, we have arrived to a field in which every discipline is the authority. This means that they must show, with honesty and taking into account the evolution of their knowledge and learning, the contents that must be present and how to project them in a teaching programme; that is, which contents and how to teach them, which tools, media and use of them, which...
objectives and the values they answer to.

Traditionally, the expression of the authority of certain sciences and its “authorised knowledge” has been common as the manifestation of this authority. Sciences have always backed true knowledge in the sense that its contributions allow the advance of science itself in a scene without barriers.

This point of view contradicts with other which could be called “perspective of knowledge as socially useful”, opposite to the first one, which can be called “perspective of ideal knowledge”. This new point of view of “socially useful knowledge” is the one which demands a more practical use of the knowledge developed and produced in and out of the educational system, with the mediation of certain new technologies and the leadership of the media, in a predominantly horizontal sense: to be able to take to society that thing which was created by what generates information and knowledge and what could contribute to adopt solutions to the problems and necessities that this society has.

In relation to content, it is conditioned by what the educational authorities prescribe. This is another aspect of one of the mentioned conceptions, but in practice, these contents are soon filtered by the style, thoughts and conditions of the teachers. There are not two same ways of understanding and expressing them.

In this sense one can affirm that the difficulty is not in the kind of authorised teaching, but in the teacher who transmits information to the students, information which can become truly useful knowledge for them: the turn is produced when students take upon themselves the objectives which previously were exclusively external and institutional. Here, the contribution of the teacher as mediator and the mediation methods play a fundamental role.

Methods are also interesting when we contemplate the reality that M. McLean and R. Blackwell (1997) describe under the terms of espoused theories and theories-in-use. This is a way of understanding the problem in relation which what the teacher says, which contrasts with what the teacher does. In the same sense, the introduction of certain media in classrooms contrasts with what finally the student perceives, many times the opposite of what they should perceive.

Methods, media, the medial uses of the contents treatments, and not only of this last concept but also of something which can be expressed in a different way because it must become an act of teaching (the pedagogical knowledge that teachers and specialists must have in order to teach in the best way) have advanced at a gigantic pace, in relation to the development of science in general.

It is not uncommon to see teachers using the overhead projector, sometimes with a computer in small seminars, or making a regular use of the video. But an attitude seems to be deep down in these practices: there is a great gap between what teachers say that students should do and what the same teachers do.

A clear example is the following: the insistence in saying that teaching is designed to make students more critical and make use of research (espouse theory), while, at the same time, they are obliged to repeat the teacher’s classes, in a clear reference to the traditional way of making written or oral exams in which the memorised reproduction of the information provided has the only real value (theory-in-use).
This manifest incoherence is not the only one about methods. Thus, we can see what can be called redefinition of the academic term in new experimental formats, the appearance of knowledge modules and modular curriculum in its expression, the redefinition of the support for the student and the tutorship services (verbal tutorship, etc.)

That is to say, knowledge and learning, because of their own nature, always convey a principle of search, creation and dissemination of their content and the progress of science with enough autonomy to grow without barriers but without losing the sense of the individual and communal necessities of the personal society. Its value is what indicates this mission and more than this, the duty and responsibility towards itself. And because of this, it is necessary to adopt good answers to certain questions, that is, not making television speak as though it was a book, or putting a video of whatever subject as if students would have to answer a multiple question examination.

Another aspect of this issue can be exemplified as the following: in schools, actions like to observe, to manipulate, to release again and again, to analyse, to confront, to interpret results are not only fundamental actions in which the method of the perception by movement is based. They also represent the steps of the experimental approach, that is, the instrument used by science to explore what surrounds us. This is the instrument which must be used to transmit knowledge and make students be aware of what a law of Physics, a chemical formula or a biological classification is.

The laboratory equipment and materials allow students to reproduce experiments, making them acquire a deep cognitive growing which lasts more, it stimulates them to adopt an approach with a correct scientific perspective, establish differences, divergences and peculiarities from visible and palpable didactic questions and, finally, allow them to select their school guidance with more knowledge.

Unfortunately, these possibilities are still very limited in present-day school structure.

In this sense new technologies may help to bridge this gap offering multimedia products or remote connections which allow students to participate in empirical experiences.

What cannot be ignored is the students’ interests in constructing meaningful knowledge. In order to learn, in addition, the students will have to put in practice several skills that they already possess at the same time they acquire new skills or improve those already possess. These skills can be organised in three groups:
- Cognitive (thinking, reflection, etc.)
- Communicative (to argue, show or defend opinions orally or writing, etc.)
- Manipulative (to use rules, a microscope, etc.)

To these others, which at present acquire a singular importance, can be added:

The metacognitive skills for learning, that is, to be aware of the strategies that we use to learn or know how to control these strategies.

The media and techniques that we use for the presentation and representation of knowledge are related to these skills, admitting the links between learning and knowledge when they stimulate:
- The teacher’s knowledge about the representations of the students.
- The student’s knowledge about their own representations.
Meaningful learning.

In a general sense, in the change that has already started, what has not changed is the way teachers and humans in general get accustomed to it: a sort of modus vivendi and modus operandi, which is internalised, through the messages and the medial supports or through the ultimate practices which add sense to the creation of meaning in every student, at the same time that they help to the emancipatory work of the individuals in relation with themselves and what surrounds them, in order to be real people.

What would constitute a problem is that teachers get bogged down or take paths which are only routines or ways that do not take them to the person.

References


Commission for the European Communities (1997). Por una Europa del conocimiento (For an Europe of Knowledge). Communication of the Commission to the Council, the European Parliament, the Social and Economical Committee and to the Committee of the Regions. COM (97) 563 final.


Jerez Mir, R. (1997). «La universidad en la encrucijada: universidad dual o universidad democrática y de masas» (University Education at the Crossroads: Dual University or
Democratic University of Masses). Revista de Educación, 314; 137-156.


Introduction

In the last few years, many European and national programmes were initiated to overcome the shortage of online teaching material in the educational sector (e.g. EU e-Content Plus programme or e-fit Austria [1]). Both professional publishers (mainly a team of authors, lectors and web-designers) and non-professional publishers (media, competent teachers in practise) had been motivated to develop online learning and teaching materials. These digital materials are placed either onto a commercial web portal, school portals of the teacher’s institution, a thematic web portal (e.g. www.mathe-online.at) and/or onto a nationwide public portal for educational resources often hosted by federal authorities (e.g. www.bildung.at). Although educational content portals nowadays address many different subjects and student levels, contain a mix of different types of multimedia-enriched teaching material, and are easily accessible via the Internet from school (directly in class or IT-rooms) or from home, it was observed that the rate of actual usage of online educational resources and their integration in general teaching practises in formal learning in German-speaking countries is low [2].

Some years ago, one would have thought that the existence of extrinsic factors, such as insufficient IT-infrastructure, low band-width or inadequate media competence of teachers, could explain this phenomenon. However, given the fact that during the last ten years a lot of energy and money had been invested combating these barriers on the national and European level, the above explanations no longer seem satisfying. Therefore, in this paper, we would like to question whether the quality of online learning and teaching materials simply does not meet the expectations of teachers and instructors and are therefore often used reluctantly. While trying to evaluate the usage and quality of e-Content collections in Austria, the following questions came up:

- How can the quality of online educational content be assessed (objectively/subjectively)?
- How important is the perception about pedagogical value of online material as usage and quality criteria for teachers/tutors?
- Do we find any indication that some specific types of learning and teaching material are selected for a specific educational setting more than others?
- What quality new online teaching and learning material and online collections should be offered in the near future?

(Accessed 13 September 2013.)
Problem

The question of assessing “non-technical” quality in e-Learning is a rather young research topic in the European e-Learning scene, however heavily discussed now in journals, papers and blogs. For example, an article on quality in e-Learning in March 2005 was recalled 7369 times (see www.elearningeuropa.info [3]). Only lately the SEEQUEL project, the IST project “European Quality Observatory” and especially work from Ehlers Ulf (2002-2004) laid the foundations for more research in this field. It can be said that the problem of assessing the usage and quality of online learning materials is ultimately affected by the same factors that influence any learning material:

- the selection of relevant content,
- familiarity with the target audience,
- expertise of the content producers,
- a didactic approach,
- the applied concept of learning, and
- the quality of communication and expressions.

As the Finnish Board of Education points out, the quality of online learning materials as well as its usability as a support for teaching and learning is influenced by new phenomena and factors [4]. For example, the online environment enables distance learning, where not only the learning material used in face-to-face teaching but also the instruction and steering of the learning process are provided online. Many online learning and teaching materials are structured as complete modules or courses that include the actual learning materials (available online or otherwise) and online interaction. Very often, these two cannot be categorically separated from each other, and from the point of view of learning, this may not even be sensible – the content to be learnt exists, in a manner, in both the content and the interaction, and the true quality of the learning material will only become evident once in use and in the right context. However, teachers base their decision of using online materials in different educational settings (regular class, afternoon lessons, projects, self-study sessions, learning at home, etc.) on the quality – pedagogical value – of online material in contrast to other teaching materials.

In order to find answers for this problem and the above questions, we have screened different quality guidelines and evaluation approaches specifically for developers of online learning and teaching materials. We critically discuss their dimensions and reflect their relevance in the context of educational settings in school. Finally, we attempt to illustrate the practical applicability of such guidelines and quality perceptions in a case study carried out in secondary and primary schools in Austria. The case study describes quantifiable usage of educational online content in Austria for the year 2004-2005 in diverse school types and for different learners’ levels. It explores factors influencing the decision of using online content for different educational scenarios, especially with regard to pedagogical content quality dimensions. It will summarise our experiences with evaluating online content collections and what can be concluded thereof for further research questions.

Theoretical aspects on the quality dimensions of e-Learning

In the following, “e-Learning” quality concepts will be outlined and screened to determine whether they can contribute to assess the quality of e-Content collections from the view of e-learning facilitators.
The individual learner’s and teacher’s perspective of quality

In order to assess e-Learning quality, Ehler argues for a quality concept focusing on a learner’s perspective: “Quality in e-Learning has to be considered as a co-production process between the learning-environment and the learner -and is thus part of his/her own responsibility. A learning process is not something that is delivered to a learner by an e-learning-provider but rather constitutes a process of co-production between the learner and the learning-environment. That means that the product/outcome of an educational process can not exclusively be influenced by the ‘production processes’ of an educational institution [4]”. He further claims that research should be concerned:

1. Firstly with which dimensions constitute quality in e-learning from a learner’s perspective; that is, which quality aspects, dimensions or criteria are important for learners? and
2. Secondly, with the notion that quality is no longer viewed as a concept in which the same quality approaches or quality criteria apply to all learners, but rather where different learners have different preferences regarding quality in e-learning [4]. This concept works well for assessing learning processes by autonomous learners using self-studying materials. However, in the context of formal learning, teachers still have a decisive role when selecting and using online content. So their perception of quality is highly relevant if one wants to extend or improve existing content collections. However, similar to the fact that learners are not a homogenous group, we may conclude that teachers also have different perceptions of e-Learning quality and of assessing online content collections. Influential factors may be their level of e-learning experience or the subject they teach and the related educational setting.

Ehlers uses the following classification of subjective quality requirements in e-learning and structures them in seven fields of quality; however, content is not a separate section, rather, it is included in some of them (4,5,6,7):

**Model of users preferences in e-learning**

- QF 1: Tutor support
- QF 2: Collaboration
- QF 3: Technology
- QF 4: Costs-Expectations-Benefits
- QF 5: Information transparency of provider/course
- QF 6: Course structure / presence courses
- QF 7: Didactics

Figure: Model of users preferences in e-learning (in Ehlers 2004)
Out of the over one hundred dimensions, the following quality dimensions can be considered as useful in the context of evaluating e-Learning quality (and especially online content) in the school context and from the perspective of teachers:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Quality Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Learner vs. Content Centeredness</td>
<td>Learners vary in their preferences of tutorial behaviour along the lines of a rather learner-oriented interaction style, referring to their personal learning process on the one hand and a more content oriented interaction and communication processes between tutors and themselves on the other hand.</td>
</tr>
<tr>
<td>5</td>
<td>Goal vs. Development Centeredness</td>
<td>This differentiation expresses a tutorial behaviour that focuses primarily on the course goals on the one hand and a more learner-oriented tutoring style that supports the personal development of learners’ learning and social skills.</td>
</tr>
<tr>
<td>21</td>
<td>Information About Course Goals and Contents</td>
<td>This dimension expresses the importance for learners to access detailed information about the course they are going to take (e.g. a prototype schedule).</td>
</tr>
<tr>
<td>25</td>
<td>Background Material</td>
<td>This dimension expresses the importance of having access to background materials on the course topics.</td>
</tr>
<tr>
<td>26</td>
<td>Multimedia Enriched Presentation Material</td>
<td>For certain groups of learners, it is important to use materials that are enriched by multimedia and use not only one but several media resources (audio, visual, movies, texts, etc.).</td>
</tr>
<tr>
<td>27</td>
<td>Structured and Goal Oriented Course Material</td>
<td>An important quality dimension can be to structure the course material in a goal oriented way.</td>
</tr>
<tr>
<td>28</td>
<td>Support of Learning</td>
<td>This dimension contains criteria that express that the course should enable users to gain learning literacy and become more skilled in their lifelong learning competencies.</td>
</tr>
<tr>
<td>29</td>
<td>Feedback on Learning Progress</td>
<td>Tests and exams should be integrated into the course material to get feedback on the learning progress.</td>
</tr>
<tr>
<td>30</td>
<td>Individualised Tasks</td>
<td>The tasks should be especially designed to fit the learner’s needs and goals.</td>
</tr>
</tbody>
</table>

**Table:** Learners’ subjective quality requirements  
Source: Ehlers, 2004

---

**Quality perception of multimedia production (based on cognitive theories on instructional design)**

Another view of what constitutes quality of content production can be found in the cognitive theory on multimedia production. Research findings from cognitive theorists suggest that there is “a place for CBT and online learning, but it also cautions us to structure it in a way that efficiently maximises learning. What is most important is not whether the instruction takes place in a classroom or on a computer screen, but whether empirically-tested strategies for multimedia instruction are employed that facilitate knowledge construction by the learner” ([5, 271]. Especially, guidelines from Mayer and Moreno (1998, 2003) for “meaningful learning” can guide developers and users to assess “content quality”. Influenced by cognitive theories (e.g. Theory of Working Memory, Dual Encoding Theory, Cognitive Load Theory, ACT-R Production System Theory, and the Cognitive Theory of Multimedia Learning (see also Mayer 2005)), they describe meaningful learning as “deep understanding of the
material, which includes attending to salient aspects of the presented material, retaining relevant information in both visual working memory and auditory working memory, organising it into a coherent mental structure, and integrating it with relevant prior knowledge [5. p.272]. They found that the following quality dimensions for the production of online content influence any learning outcome:

- **Modality Principle**
The modality principle states that better transfer occurs when multimedia combines animation/pictures and narration as opposed to animation/pictures and on-screen text, i.e. students learn better in multimedia messages when words are presented as spoken language rather than printed text. This relates directly to the Theory of Dual Coding, which suggests that we have two types of working memory, one verbal and one visual, and that we learn best when both channels are used together, rather than overloading one or the other.

- **Contiguity Principle**
The contiguity principle states that better transfer occurs when corresponding narration and animation are presented simultaneously, both temporally and spatially. Temporal contiguity means that corresponding words and pictures should be presented at the same time, while spatial contiguity means that corresponding words and pictures should be presented near rather than far from each other on a page or screen. In other words, don’t place an important visual image on one page or frame, and then discuss it on a preceding or following page/frame without continuing to show the visual image.

- **Multimedia Principle**
The multimedia principle states that better transfer occurs from animation/pictures and narration/words than from words alone. When words and pictures are both presented, learners have the chance to construct verbal and visual cognitive representations and integrate them.

- **Personalisation Principle**
The personalisation principle states that better transfer occurs when narration is conducted in a conversational style (first or second person) rather than a formal style (third person).

- **Coherence Principle**
The coherence principle states that better transfer occurs when extraneous material such as irrelevant video, animation, pictures, narration, and sounds are excluded. This is where instructional designers who employ gaming technology should be careful. I also like to compare this effect to humorous commercials that we all love and talk about, yet can’t remember what the commercial was selling or who the sponsor was.

- **Redundancy Principle**
The redundancy principle states that better transfer occurs when animation and narration are not combined with printed text. When pictures and words are both presented visually, it can overload visual working memory capacity.

- **Pre-training Principle**
The pre-training principle states that better transfer occurs when training on components precedes a narrated animation. If the learner doesn’t understand the nature of each component, trying to construct a model of each component while trying to understand how they integrate with each other will quickly overload working memory. It is better to do pre-training on each component so that the learners already possesses schemas for them before presenting material that requires the learner to integrate
each component into larger schemas. This connects to the concept of chunking and building schemas. Learners have to create low level schemas about a concept, before they can combine them into larger, more complicated schemas.

- **Signalling Principle**
  The signalling principle states that better transfer occurs when narrations are signalled. Signalling reduces cognitive load in auditory working memory by providing cues to the learner about how to organise the material. Signalling assists learners in the process of organising sounds; this can result in deeper, more meaningful learning.

- **Pacing Principle**
  The pacing principle states that better transfer occurs when the pace of presentation is controlled by the learner, rather than by the program. Learners vary in the time needed to engage in the cognitive processes of selecting, organising, and integrating incoming information, so they must have the ability to work at their own pace to slow or pause the presentation if necessary. If the pace of the presented material is too fast, then these cognitive processes may not be properly carried out.


**Comprehensive criteria guidelines on online educational material by Educational Boards**

Besides theoretical approaches, we have also screened a number of “e-Content guidelines” issued by national educational bodies in the last few years. The Northern Ireland Partnership for e-Learning issued the following “Quality and Standards Indicators for e-Learning in Schools (2004, p. 7). As regards e-Content, they propose: “e-Content should be of high quality and fit for purpose so as to improve the quality experience of the e-learner”[6].

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Feature</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>being directly relevant to the curriculum /</td>
<td>-being directly relevant to the curriculum / specification -contributing to improving standards and encouraging excellence</td>
<td>-clearly identifying the intended learning goals -being free from bias and having integrity</td>
</tr>
<tr>
<td>specification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>format, presentation and accessibility should</td>
<td>-have a clear uniform structure - comparable in rigour, depth and breadth to off-line delivery methods - accommodate different learning styles - challenge the learner and allow for remediation -promote active learning and interaction with others -exploit the interactivity of the technology -conform to RAID principles (re-usable, accessible, interactive and discoverable)</td>
<td>-consistent in presentation and standard -demonstrate how to progress through the content -challenge the learner and allow for remediation -exploit the interactivity of the technology -conforms to international technical standards for indexing -flexible, adaptable and able to be modified -free from copyright restrictions</td>
</tr>
</tbody>
</table>

A working group from the Finish Board of Education groups their guidelines for producing educational content of high quality into four sections [7]:

- **Pedagogical quality:** refers to features in the learning material that support learning of all regardless of their age, physical or mental capacity, disabilities or applicability of the material in teaching and learning processes.

- **Usability:** refers to the technical structure and interface design of the learning material as well as the ease of use arising from these features. Usability is dependent on the user’s experience.

- **Accessibility:** in this context means that the online learning materials are accessible to all.

- **Production quality:** The production of online learning materials fulfills quality criteria if it is carried out in a controlled and documented manner, steered by knowledge-based, skill-based and learning-based goals, and if the end product meets professional standards.

Also, in Austria, the Federal Ministry for Education and Science released ten rules for e-Content development (e-Content Erlass, BMBWK (2003). The set of proposed production guidelines are correctness, structure, emotionality, adaptability, content, reflectivity, exportability, standardisation and legal correctness [8].
References

REPORT CONTENT VILLAGE, July 2004, e-Content in Austria, p.3.


Learning objects and learning theory

Introduction

In the broadest sense, a learning object is anything that has an educational purpose (McGreal, 2004). In the case of an online course, it is a given that a learning object is a digital object that is used in order to achieve the desired learning outcomes or educational objectives.

Although the term, “learning object” originated from the notion of “object-oriented” computing and programming, which suggests that the ideal way to build a computer program, or anything digital, is to assemble it from standardised, small, interchangeable chunks of code, the approach is somewhat different in an e-learning setting. In this case, learning management systems (LMS), of which popular commercial ones are BlackBoard, WebCT, and Desire2Learn, could be considered large meta-objects, that contain spaces for the incorporation of granular objects. The analogy that is often used to describe this is that of LEGO™ building blocks. The building blocks have a standard shape and configuration, but they can be used and put together in many ways, to create unique entities, limited only by the imagination (and good planning).

Downes (2005) and Leslie (2005), along with other writers, have focused on the need to create objects of sufficient granularity to assure effective implementation across multiple courses. In the UCB Wiki, Leslie (2005) described the contexts of sharing of learning objects, and categorised them as sharing, multi-purposing, and repurposing.

By housing interchangeable objects on a server and allowing multiple and simultaneous access via the Internet, instructional designers and instructors can access the objects simultaneously and incorporate them into their programs. However, this is not always the case in actual practice because the learning management system, which functions as a relational database, integrating instructional material along with administrative material, may actually block the use of sharable content objects, depending on what they are, and what information they contain.

The other exception to this is the increasing adoption of blogs and podcasts as e-learning objects. These can be as granular as their RSS feeds, which is to say that they're not very granular at all, because they must be used in conjunction with the codes and third-party services that syndicate, distribute, classify, and house them.
Location of Learning Objects for Use in E-Learning

In the mid-1990s, relatively simple learning objects were made available informally, as instructors shared syllabi, lesson plans, and learning activities. Later, more complex and/or topic-specific repositories came into existence as museums, journals and magazines, educational television, and other organisations placed content on the web and encouraged it to be used for educational purposes. Many even developed learning activities around the objects (thus creating a larger, “second-order” learning object), and made them available via download from their websites.

Later, sites dedicated themselves to making learning objects from all disciplines. Instead of housing the objects on their own servers, they often linked to the original sites where the objects were made available. Large repositories of learning objects are now available from MERLOT, CAREO, and Wisconline, among others. Although this tactic offers greater access and availability, they are not always easily navigated, nor is there a uniform system for classifying them, although several projects are underway.

Examples of repositories of learning objects for use in specialised training include the aviation industry and its AICC (Aviation Industry Computer-based Training Committee), that helps set standards. Other industry and military issues are dealt with by such initiatives as the NMC Learning Object Initiative (http://www.nmc.org/projects/lo/qtso.shtml). NMC, the New Media Consortium, is an international 501(c) 3 not-for-profit consortium of approximately 200 colleges, universities, museums, corporations, and other learning and education based organisations that use new media and new technologies.

Wikis: The term used to describe a shared media repository, wiki, derives from the Hawaiian word, “wiki-wiki” for “quick” or “informal.” (http://www.wikipedia.org) In a broad sense of the word, the entries could be considered learning objects. In practice, wiki entries do serve educational functions, and many online courses link to wiki entries to provide definitions and perspectives on the subject being studied.

Serious Games: Video game-based simulations or “serious games” have been incorporated into both online and hybrid courses. These are rarely hosted on the educational institution’s server; instead, the individual learner downloads the program and runs it in accordance with the instructions given in the course. Some allow collaboration and role-playing in a manner that involves a large number of players or users. Social Impact Games (http://www.socialimpactgames.com/) has identified and classified more than 500 “serious games,” many of which are available for free download and play. Their goal is to identify video game-based simulation and serious games that have connections with current global and local social issues.

Weblogs: Weblogs, or “blogs,” constitute informal repositories of learning objects in two ways. First, the “blog roll”, or list of related or recommended blogs, helps one become acquainted with other blogs. The blogs in the blog roll can, in fact, be considered learning objects when utilised for an educational purpose. Agregators of blogs that bring together excerpts of posts from blogs by means of syndication (RSS) also could be considered informal repositories of learning objects.

Podcasts: Podcasts are MP3 files that are managed and distributed in much the same way as blogs, so they may also be considered informal learning object repositories. Instead of being text-
based, these files are audio files, and they are downloaded through the Internet and played on MP3 players. The originating host usually maintains an inventory of the MP3 files which can be accessed through syndication and other audio feed services.

**Problems in Implementation**

Faculty and instructional designers encounter problems when they try to adapt learning objects for delivery in their general education college-level distance courses that are intended for a military audience. One result is disappointment and frustration in those who believed in the promise of learning objects to save time, to provide robust solutions with depth, high quality, and to perfect interchangeability.

When searching for "learning objects", one is likely to encounter a vast array of terms and ways to describe them. Terms include knowledge objects, educational objects, knowledge chunks, digital objects, digital educational computer programs, and Flash-exercises.

Once one has untangled the nomenclature problem, one can go to the various repositories. Repositories can look like directories, with large databases that link out to the actual location of the object. Other repositories have a search function that allows one to go out and retrieve objects from archives they maintain on their own servers.

*Problem 1 - Not really interchangeable:* Because the objects are not of consistent size, nor are they written in consistent languages, they are not really interchangeable in the way that you'd think they'd be. Some are interactive, and others simply consist of text. They can be in html, flash, java, and java-script. Others can be in audio, media, synched PowerPoint, movies, requiring players or internal "jukebox" players.

If one is developing a course for online delivery, sometimes the easiest way to incorporate the object is to link to it. However, there are many problems associated with that strategy - links go down, students may not have the right drivers, plug-ins, etc. Worse, the object itself might "almost" fit one's need, but may not.

Many objects are culturally-inflected, which is to say that they may not be appropriate at all for diverse learners in remote settings, which definitely characterises military learners.

*Problem 2 - Can't find them (lack of consistent classification schemes):* Many initiatives have focused on the need to develop a classification scheme, and to catalogue the objects so that individuals can retrieve them, and organisations can archive them. Other issues, such as the learning level (K-12 through graduate) are not resolved in a consistent way. Nor are the points of authorship, copyright, language of the object, etc.

*Problem 3 - Quality is highly variable, despite the attempts of some to institute peer review, or quality criteria:* MERLOT, CAREO, and others repositories have put together an extensive peer-review approach. Commercial developers have developed systems of quality assurance. However, these are not consistently applied in the production, classification, and/or guide to use of the objects.
Quality and usability issues can often be resolved if designers, technologists, faculty, and subject matter experts are trained in modifying learning objects. This is an excellent solution, but a source of deep frustration, due to the fact that the process is time-consuming and there is no guarantee of successful incorporation of the object into the course or learning application.

Factors determining usability of learning objects

**Relevance:** For a digital object to be effective in an online course, it must be relevant to the course content, and must materially contribute to the achievement of outcomes.

**Usability:** The digital object should be usable in the platform or delivery system in use, and it must be accessible by the users.

**Cultural appropriateness:** The digital object should be appropriate culturally, and the meanings that it communicates within a cultural context should reinforce learning objectives.

**Infrastructure support:** Objects, whether large or small, simple or complex, should be housed and delivered on a system that is sufficiently robust to handle surges in traffic, bandwidth usage, and storage of large files. It is often necessary to look at solutions such as "edge" computing, which means housing the material on multiple servers.

**Redundancy of access:** It is important to make digital objects accessible through more than one means of delivery. For example an MP3 audio object could be delivered via Podcast, RSS, or direct download via a link.

**Size of object:** Large objects are sometimes unusable if the users are in remote location where access is poor and/or slow. Optimising the size of the object, particularly images and audio files is important. For example, using MP3 files instead of wav files can help save space and lead to a more cost-effective solution.

**Relation to the infrastructure / delivery:** If the object is easily integrated into the learning management system, it is treated differently than a large, complex object (a game, for example), that might be run in conjunction with the learning management system. It may be necessary to modify the delivery system and/or rationale.

The selection of the Learning Object is influenced by the course delivery method

1. Online: If the course is delivered using a learning management system such as Desire2Learn, Blackboard, WebCT, etc., it is often important that the learning object have a small size (under 100k) and that it resides in a sharable content file in order to keep from having to replicate it multiple times.

2. CD-ROM or DVDs: Large and complex learning objects, such as video game-based simulations, movies, interactive voice recording (language acquisition) may be best delivered in a CD-ROM or DVD format, particularly if connections are slow and it is not necessary to have simultaneous multi-user access.
3. **PDA**: Interactive (BlackBerry, Palm Pilot) or non-interactive (handheld computer, such as Dell Axim): Large or complex objects requiring Flash, shockwave, java applets, or other plug-ins will not work in most PDA environments. Thus, learning objects must be developed so that they can be translated into the software program used by most mobile computer / handheld environments. This could include MS-Word and MS-PowerPoint for palms or mobile computing.

4. **Hybrid / Blended**: Because of the flexibility of the blended solution, it is often possible to utilise many different types of learning objects, ranging from small digital images to rich multimedia and video game-based simulations.

**Learning Objective Effectiveness**

Learning object effectiveness is a function of the flexibility of the instructional designer, the intended use, and how central the object is to achieving learning objectives. Some learning objects are really very useful and easy to use. These include interactive grammar reviews for written language acquisition, writing skills development, etc.

Others are very important for achieving learner self-efficacy and self-regulation, as well as improving motivation - for example, interactive maps (of geographical features, the body, animals, etc.) can be engaging, informative, and easy to use. Other examples include interactive dictionaries, and virtual museums that connect the images, background, descriptions, and sources for research.

**Best practices for instructional design using learning objects**

Before using a learning object, learning objectives, desired learner outcomes (performative and measurable), range of content and learner level, and instructional strategies must be in place.

1. **Keep motivation theories in mind when selecting objects.** If learning objects are selected without keeping in mind certain theories about how humans are motivated, or demotivated, the courses that incorporate them are likely to be ineffective.

2. **Align outcomes with instructional activities that incorporate learning objects.** Learning Management Systems and learning objects. It is important to review how the object is intended to be used, how it is used in actual practice. In addition to assessing the learners to gain an appreciation of their values, needs, and interests, it is also important to articulate how the learning objects are intended to be used, and how their use will affect outcomes. Then, after the course is deployed, it is important to conduct a post-course review to see how the objects were actually used, and what kinds of outcomes were achieved.

3. **Resolve potential technological issues**: In addition, all the technological issues must be worked out. What platform will be used? Will a learning management system be used? Will this be a live web-based course? What kinds of access will the students...
have? Will it be offered in CD-ROM format? Will you use PDAs or hand-held computers? These have to be considered because it is very difficult to retrofit an object once it is incorporated into a learning module.

4. **Maintain multiple delivery modes:** **Online, blended, mobile, video game-based simulation.** Because of the increasing need to deliver courses across multiple modes, it is important to design objects so that can be reused or easily repurposed for the modes the learner will be using, and for the actual conditions of delivery. A needs assessment is important for this.

5. **Remember real user capabilities and needs.** Learning objects vary in size, use, and complexity. Some, such as virtual chemistry labs, require an extensive repertoire of skills, and the ability to work within a number of plug-ins. Others, such as maps or simple images, are static and very easy to use. Although these are easy to use and download, they may not be appropriate if the learner is using a small screen hand-held computer.

6. **Sociological Factors.** Understanding the cultural beliefs and values is critical in developing an instructional strategy that uses learning objects. It is important to understand the values and how one might unintentionally offend a learner. It is also important to understand cultural values in order to use objects in a way to reinforce self-concept and to motivate.

7. **Psychological Factors.** Motivation, self-concept, self-efficacy, and basic beliefs about how the mind makes meaning are very important. It is also important to understand how learning objects can make connections between the learner’s experience and the concepts presented in the course in order to achieve learning goals. Learning objects can (if utilised properly) be effective ways to enhance the learner’s self-efficacy and self-concept, as well as to improve the learner’s self-regulation in the quest for effective, flexible, and adaptable learning strategies.

8. **ADA compliance.** This is very critical for implementing learning objects, particularly for users with low vision, low hearing, or cognitive needs.
References


Textbook provision scheme in Brazil


The Basic Education Secretariat (SEB – Secretaría de Educación Básica) is an entity that belongs to the Ministry of Education and is in charge of supporting states and municipalities, which have the lowest level in quality education. It develops programs, makes educational policies, technical guidelines and allots resources, together with other state and municipal systems and with social organisation systems.

The Education Development National Fund (FNDE – Fondo Nacional de Desarrollo de la Educación) is another entity of the Ministry of Education whose mission is to supply and use resources for the development of public education with the aim of enhancing its quality. Among its main challenges, there are the efficiency in the settlement and assignment of budgets for education salaries, the management of financing programs, and the purchase by the government of didactic material, as well as the constant search for alliances and institutional strengthening.

The FNDE’s resources are granted to the states, Federal District, municipalities, and NGOs responsible for basic education in public schools.

Brazil’s National Textbook Program - PNLD

Since 1929, when the Brazilian government created a specific body to rule on textbook policies, the National Book Institute (INL – Instituto Nacional del Libro) has worked to supply didactic and para-didactic textbooks to federal, state, municipal and Federal District schools.

Nowadays, that policy is supported by The National Textbook Program (PNLD – Programa Nacional del Libro Didáctico) and the Secondary Education Textbook National Program (PNLEM – Programa Nacional del Libro Didáctico para la Enseñanza Media).

The PNLD freely distributes didactic textbooks for all students attending any of the eight levels of basic education in the public system.

The PNLD is an initiative of the Ministry of Education and its objective is the enhancement of education quality by means of the acquisition and distribution of Portuguese textbooks and dictionaries to Basic Education Public Schools (grades 1 to 8).

The PNLD is carried out by the Secretariat of Basic Education (SEB- Secretaría de Educación Básica) of the Ministry of Education together with the Education Development National Fund (FNDE- Fondo
In order to assure the quality of the textbooks to be acquired, the SEB coordinates a pedagogical assessment process of the textbooks classified within the areas of Literacy, Portuguese Language, Math, Sciences, History and Geography.

The National Textbook Program (PNLD) was implemented in 1985 with the aim of freely distributing textbooks to students receiving basic education in public schools. The PNLD contributes to universalising and improving learning, promotes the appreciation of guidance when assigning teachers the task of selecting the most suitable textbooks for their task. The textbook must be used during three consecutive years, favouring more than one student in the subsequent years.

The PNLD is carried out in two ways: Centralised (the FNDE is fully responsible for the actions taken) and Decentralised (actions are carried out by the Units of the Federation, by means of a division of the Federal Government resources in accordance with the FNDE).

Sao Paulo is the only state which has chosen decentralisation. For that reason, the FNDE provides financing resources to the Sao Paulo State Secretariat of Education, which is the body responsible for the whole program’s executive process.

Due to its success, the PNLD tried to cover the distribution of Portuguese language dictionaries, Braille books and books for Secondary Education. The Ministry of Education’s objective is to contribute to the creation of citizenship, and to the intellectual and cultural development of students. Since 2003, public schools for special education and private institutions, defined by the school census as communitarian and philanthropic, have been included in the program.

### TABLE 3

<table>
<thead>
<tr>
<th>Process Stage</th>
<th>Responsible Body and Description of Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Annually, the Secretariat of Education and the General Coordination of Studies and Validation of Materials Department issue an edict which sets forth the rules for the inscription of textbooks.</td>
</tr>
<tr>
<td></td>
<td>It is published on the news and posted on Internet, thus, determining a time period for the presentation of the works by the publishing houses which own copyrights.</td>
</tr>
<tr>
<td></td>
<td>The proposals submitted for the bidding must come from several privately-owned publishing houses.</td>
</tr>
<tr>
<td>Selection</td>
<td>In alliance with the Technological Research Institute (IPT – Instituto de Investigaciones Tecnológicas), the FNDE analyses the physical characteristics of textbooks, in accordance with the technical rules of Brazil’s National Standards Association (ABNT – Asociación Brasiler a de Normas Técnicas), ISO regulations, procedure manuals and pre-elaborated essays. In order to analyse the works presented, the requirements of the notice are taken into consideration, and opinions are given with the contribution of the IPT and public universities</td>
</tr>
</tbody>
</table>
hired by the General Coordination of Studies and Validation of Materials Department. The selected textbooks are sent to the Secretariat of Children and Basic Education (SEIF - Secretaría de Educación Infantil y Fundamental), responsible for the pedagogical validation of textbooks. The SEIF selects the experts to analyse textbooks using the criteria defined by it and divulged in the notice. The FNDE and CGEVM put at all interested people’s disposal the Textbook Guide on Internet, and send the printed material to the schools registered in the School Census. By means of a selection process used in the Textbook Guide, headmasters and teachers analyse and select the works to be used as textbooks. Teachers, accompanied by the General Coordination of Studies and Validation of Materials Department throughout the whole process, propose two alternatives:

- The first alternative is carried out throughout Internet. Teachers fill in a form available at the FNDE web page.

- The second alternative is carried out by means of a form sent by mail. (In addition to the Textbook Guide, the FNDE sends, to the schools registered in the School Census, a school form which is filled in by teachers in order to select the works desired.)

### Acquisition

After compiling the data from printed and electronic forms, the FNDE initiates the negotiation process with the Publishing Houses. Acquisition is carried out by a bid set forth under Law 8.666 of 1993, taking into account that the textbook selection is made by teachers. In order to keep uniformity in the assignment of FNDE resources, and to avoid great fluctuations every year, the general purchase for students of grades 2 to 4 and of grades 5 to 8 takes place in alternate stages. In the purchase interval, books which were lost are restocked and/or the stock of books is completed or increased, in case the number of enrolments has increased.

The quantitative definition of the sample books to be bought shall be made based on the INEP’s annual projections on enrolment fluctuations. Book acquisition is performed in a centralised way for all Brazilian states, except the state of Sao Paulo. The FNDE provides resources to the Sao Paulo State Secretariat of Education, which is in charge of the whole process (enrolment, validation, acquisition and distribution).

### Distribution

It is directly carried out by the publishing houses by means of an agreement entered into with FNDE and the Brazilian General Post Office Company (ECT – Empresa Brasileña de Correos y Telégrafos). The process is followed by technicians belonging to the FBDE and to the State Secretariats of Education. Textbooks arrive at schools between October and December of the year prior to the current academic year. In the case of schools in rural areas, textbooks are delivered to Prefecture delegations or to the Municipal Secretariats of Education to be later and directly distributed to schools. Each student holds the right to have a textbook in all core subjects, Portuguese Language, Math, Sciences,
Beneficiaries:
Students of all the schools registered in the School Census carried out on a yearly basis by the National Institute of Educational Studies and Research (INEP – Instituto Nacional de Estudios y Pesquisas Educacionales).

DICTIONARIES: For the academic period of 2001, 20,231,351 dictionaries were acquired for a total amount of US$ 28,910,513. About 38.9 million dictionaries were distributed until the year 2004. The dictionary is property of each student who can share the bibliographic source with his/her family.

BRAILLE BOOKS: Since 2001, the PNLD has extended, freely, the attention period to students who attend ordinary classes in public schools and who suffer from visual deficiencies.

BOOK FOR SECONDARY EDUCATION: On October 23rd, 2003, the Ministry of Education, by means of Resolution CD/FNDE No 38 of the Secondary Education Textbook National Program (PNLEM – Programa Nacional del Libro para la Enseñanza Media), agreed to freely distribute textbooks to secondary students attending public schools. Initially, the program undergoes an experimental stage (experimental project) in which Portuguese Language and Math books must be distributed to students enrolled in public schools located in the Northern and Northwestern regions of the country.

The execution of the PNLEM shall be the responsibility of the FNDE and of the Technological and Secondary Education Secretariat (SEMTEC – Secretaría de Educación Media y Tecnológica), as well as the participation of state and municipal secretariats of education.

Statistical Summary:

Between 1994 and 2003, the PNLD acquired a total of 915.2 million units of books to be used during the academic periods of 1995-2004. These books were distributed at a yearly average to 30.8 million students, enrolled in about 172.8 thousand public schools of basic education. In this period, the PNLD invested almost $3.2 billions Reais.
I. Project description

Uzbekistan inherited a well-developed educational system upon independence from the former Soviet Union in 1991. In basic education, there was almost full enrolment. However, the system was inefficient, expensive, and based on Soviet values and labour requirements of a centrally planned economy, which were ill-suited to post-independence needs of a nation in transition. The economic downturn ensuing after the breakup of the former Soviet Union impacted negatively on the education system and on most budget-supported sectors. As a result, basic education was underfunded and underinvested. Lacking essential inputs and operating basically within the old system in terms of curricula, syllabi, and teaching methodologies, the quality of, relevance, and access to basic education became major concerns of the Government.

Before the Basic Education Textbook Development Project (the BETDP), textbooks were outdated, unattractively designed, and did not meet emerging needs of a transitional economy, reducing learning achievements. The textbook production system followed a central planning approach that was neither efficient nor cost-effective. In 1995, the Government had decided to change from Cyrillic to Latin script, requiring the comprehensive rewriting and reprinting of all textbooks. Improving education quality by providing better designed, more durable, and more widely available textbooks produced more efficiently became a priority for the reform of the education sector.

The BETDP, comprising: (i) a development finance institution (DFI) loan (ordinary capital resources [OCR]) of $20 million to be relent to publishers and printers for upgrading equipment and procuring high-quality paper and cover board; and (ii) a project loan (Asian Development Fund [ADF]) of SDR14.455 million ($20 million equivalent) to be used for other project components, including capacity building and purchase of selected textbooks, was approved on 17 December 1997. The BETDP aimed to improve the quality and relevance of basic education by increasing the quality, durability, and availability of textbooks and other instructional materials, and enhancing the efficiency of the textbook production system. These improvements were to be accomplished by: (i) developing capacity in curriculum development, textbook writing, and publishing; (ii) providing new Latin-script textbooks in key subject areas; (iii) training classroom teachers to use student-centred teaching methods; (iv) reviewing and strengthening the textbook production system; (v) upgrading equipment for publishing and printing; and (vi) providing high-quality paper and cover board for more durable textbooks. At appraisal, it was anticipated that the Loan 1595-UZB (SF) would provide about 7.1 million textbooks, 255,800 teacher guides, 1.68 million library books, and 15,000 kits of classroom teaching aids, and would directly benefit about 3.2 million rural students and 12,000 senior rural teachers.
Additionally, the BETDP included two associated advisory technical assistance (TA) projects to strengthen the monitoring of educational reforms and improve the cost-effectiveness and efficiency of the education system.

II. Evaluation of design and implementation

A. Relevance of design and formulation

The BETDP addressed key concerns of the Government in basic education by (i) strengthening textbook publishing and printing capacity; and (ii) providing more durable textbooks with modern pedagogical content in core education subjects as well as teacher guides, library books, and teaching aids. The BETDP development objective was consistent with the Government’s education reform program and consistent with the Asian Development Bank (ADB) country operational strategy at that time. Project outputs, inputs, activities, and implementation arrangements were clearly articulated and documented. Overall, the BETDP design was relevant and its formulation sound, and improved availability, use and quality of learning materials has had a positive impact on learning and teaching. In retrospect, project design could have included a more rigorous monitoring and evaluation framework.

Soon after loan approval, the Government announced the enactment of three laws affecting the education system, which, in turn, required amendments in the implementation arrangements of the newly approved Loan 1595-UZB(SF): (i) the introduction of the National Program for Personnel Training (NPPT) in August 1997 to guide long-term educational reforms in training of teachers and extending compulsory education to 12 years; (ii) the introduction of state education standards (SES) in August 1999; and (iii) the abolition of free state provision of textbooks in January 1998, which resulted in parents being asked to pay for textbooks from grades 2 to 11. The modifications to the project design (i) strengthened the effectiveness of teacher education; (ii) supported curriculum development and introduced the concept of content integration (learning objectives, teaching styles, and assessment system); and (iii) were instrumental in creating the textbook rental scheme (TRS), which provided for sustainable provision of textbooks for basic education.

The TRS allows parents to pay a fraction of textbook purchase price as rental fees. The scheme is based on three principles: (i) improving affordability—amortising the cost of textbooks over 4 or more years, thus keeping the rental fees low; (ii) strengthening sustainability—fees collected are designated for buying replacement copies of textbooks when due; and (iii) enhancing cost-effectiveness and physical durability by incorporating quality measures in textbook procurement. A pilot TRS was implemented with success in school year (SY) 2001-2002, supplying 1.6 million textbooks and teacher guides to 575 schools (about 6% of total number of schools) in all 14 regions. As a result of the successful pilot implementation, the Cabinet of Ministers approved phased extension of the TRS to the entire country starting from September 2002.

At completion, the BETDP reached and surpassed most of the expected outputs anticipated at appraisal. It: (i) achieved an average ratio of 10.4 textbooks per pupil for primary and lower secondary students; (ii) improved the quality, durability, and availability of textbooks and other instructional materials; and (iii) enhanced the efficiency of the textbook production system. A comparison of targets listed in the project framework with achievements is in Appendix 1.

The rationale for the DFI loan administered by the National Bank for Foreign Economic Activities of Uzbekistan (NBU) was to provide $20 million of revolving credit facilities to domestic publishers and
printers—$9 million to procure equipment and $11 to procure designated paper and printing consumables. This loan addressed two critical issues in textbook development: (i) limited durability attributable to poor-quality paper and binding, which limited the classroom life of textbooks to about 1 year and led to textbook shortages; and (ii) inadequate access to foreign exchange and cost inflation, which prevented publishers and printers from upgrading equipment and purchasing better-quality paper. The annual interest charged to sub-borrowers varied from 35.5% (2002 and 2003) to 21.5% (2004), based on the refinancing rate determined by the Central Bank of Uzbekistan (30% to 16% per annum) plus an annual exchange risk premium of 4% specified by the Ministry of Finance (MOF) and 1.5% profit margin for NBU.3

The two associated TAs supported sector reforms and complemented the project objectives by strengthening data collection and policy analysis capacities of the Social Complex of the Cabinet of Ministers, and identifying strategies for improving cost effectiveness of the education system.

B. Project outputs

The BETDP was implemented from August 1998 to September 2004. The outputs under the six principal components are reviewed below. Achievements are compared with output targets in Appendix 1.

1. Capacity Building in Curriculum Development

The first component aimed to strengthen local curriculum development capacity in six key subject areas and implement the SES by providing in-country and overseas training to curriculum designers, carrying out research studies, improving syllabi for six subjects, and providing new textbooks and teaching materials.

Eighteen senior curriculum and textbook developers, and authors in six subject areas took part in a study tour to the United Kingdom and upon return carried out six research studies on curriculum reforms. Training of 151 district and raion curriculum designers was provided on curriculum design, integration of subjects, redesigning of the curriculum, and preparation of teacher guides. New student books and teacher guides, based on SES, were developed in six subject areas. Student books included a strong cross-curricular dimension, promoted critical thinking and were systematically piloted before publication. Books distributed to schools were well received. In addition, four desktop computers equipped with publishing software were procured and delivered to the Authors’ Centre within the Republican Education Centre.

All output targets were achieved and targets on the number of new textbooks provided to schools and staff trained were surpassed (Appendix 1). Appendix 2 indicates the outputs reached in the production of textbooks, teacher guides, library books, and materials.

2. Improving the Pedagogical Quality of Textbooks

The objective of the second component was to enhance the learning impact of education by improving the capacity of the Ministry of Public Education (MOPE) to design basic education textbooks. Significant outputs included (i) research studies on gender presentation in textbooks, textbook design baseline, and authors’ pay; (ii) capacity building in manuscript development, editing, and evaluation for 122 persons; (iii) training of 22 authors at primary and 40 at secondary levels; and (iv) procurement of desktop publishing equipment and resource materials for school libraries. Targeted outputs were reached, with two exceptions: (i) the number of library books delivered to schools was 0.56 million
against the appraisal estimate of 6.68 million, as MOPE considered textbooks a higher priority than library books (para. 21); and (ii) three short-term overseas working attachments for local publishers and printers anticipated at appraisal were cancelled. In both cases, MOPE decided to concentrate the financial resources available to provide one textbook per subject to all pupils in grades 1 to 9 (para. 21) and supply the balance of reference materials later. This proved to be justified since the quantity of textbooks envisaged at appraisal was not sufficient to provide one textbook per pupil in grades 1 to 9 in rural and urban schools (Appendix 2).

These activities enabled MOPE to assess quality changes achieved by the Project, set a framework for revising publishers’ attitudes to authors’ pay, and provided the publishing industry with a practical guide to textbook design functions. At the end of the Project, MOPE had a cadre of 62 authors and 122 specialists trained in desktop publishing, manuscript evaluation and editing, and gender issues in textbooks.

A sampling of views of teachers and parents from 12 schools conducted by the project completion review (PCR) Mission provided anecdotal evidence of improvements in the pedagogical quality of new instruction materials. Those singled out by teachers focused more on the process of learning; took creative approaches to real-life situations; developed a climate of openness, trust, and concern for others; and expected the learner to actively seek information. Teachers linked improved learning outcome with activity-based learning and increased teachers’ effectiveness.

3. Improving the Use of Learning Materials

This component was intended to ensure that high-quality learning materials were effectively used in the classroom. Two research studies were conducted to survey teaching methodologies and learning skills, and assess needs for in-service training. Based on the findings, the component (i) developed training materials for student-centred learning (SCL) in six subject areas, (ii) trained a cadre of trainers of trainers, (iii) provided in-service training to teachers, and (iv) procured training materials and training equipment for in-service training institutes. All quantitative outputs set at appraisal were reached and some were exceeded (Appendix 1, item 3.3).

The major impact of the activities was the introduction of SCL to the teaching force, and the knowledge and confidence passed on to teachers to carry out SCL. The training materials produced and the cascade system for delivering the training were also important resources for capacity building. Numerous requests for further training in other subject areas emerged from these activities.

4. Improving the Quality and Efficiency of Textbook Production

The fourth component supported improvements in the textbook production system by (i) developing strategies for improving textbook production, and (ii) capacity building for local publishers and educators to implement them. Three research studies on the analysis of textbook sales and provision formed the basis to develop the MOPE textbook policy, which led to the development and adoption of the TRS and a draft charter for establishing a republican textbook revolving fund foundation (RTRFF). A study tour to publishing houses in the United Kingdom for 12 directors and publishing managers of local publishing and printing houses and 6 officials from MOPE and other relevant agencies funded under the project, and in-country training of 29 participants from the printing industry was ground-breaking and strengthened the capacity for textbook production and management. Training in bid evaluation for 75 practicing teachers in various subject areas provided under this component created a pool of trained evaluators for MOPE. A total of 17,482 librarians, teachers, and school directors were
trained in support of the TRS. The short-term overseas working attachments for two local publishers and printers planned at appraisal were not implemented due to a lack of qualified candidates with sufficient knowledge of English.

5. Increasing the Supply of Textbook and Learning Materials

This component aimed to increase the supply of Latin-script textbooks and supplementary learning materials for basic education, especially in rural schools, by providing new Latin-script textbooks and teacher guides, Latin-script Uzbek-language reading materials for school libraries, selected basic education textbooks for non-Uzbek language schools, and kits of supplementary teaching aids. At appraisal, project funding allocated for textbooks was to provide at most 6 books per student (34.7 million books for 5.8 million pupils in grades 1 to 9). During implementation, MOPE and ADB agreed to provide one textbook per student in each subject in grades 1 to 9, and the accompanying teacher guides. MOPE requested revisions in the textbook plan and lists of textbooks and materials. This led to a minor change in scope approved by ADB in October 1999. Accordingly, funds originally planned for library books were reallocated so as to produce more textbooks. Consequently, the Project procured 58.22 million textbooks (an average of 10.4 textbooks per student for 5.59 million pupils) and 1.30 million teacher guides, against the appraisal estimates of 34.69 million textbooks and 525,000 teacher guides. In addition, 755,000 library books were produced against the appraisal estimates of 1.6 million, and 6,600 textbooks for blind children, and 49,000 visual kits of supplementary materials for schools were provided. Textbooks and teacher guides procured under ADB financing are listed in Appendix 2.

This component also included a seminar on textbook marketing attended by 17 local publishers. The seminar was particularly relevant to publishers because in the past they had no need to market their books and therefore had no specialised staff with marketing skills. To further strengthen cooperation among education institutions and publishers, clear and transparent criteria for selecting books against specified technical criteria and commercial terms were developed and implemented.

This component also brought about three unanticipated benefits. The first was the launching of successful competitive bidding for textbook production which opened the way to liberalisation of reform of authorship, educational publishing and printing, and has since been adopted by MOPE as the standard textbook procurement mode. The second benefit was the selection of more authors of textbooks and teacher guides from oblast and local levels, compared with the former preference for authors from cities. The third was the heightened awareness and recognition by headmasters of the importance of helping teachers overcome the anxiety of moving from traditional to more interactive teaching.

6. Improving Textbook Durability

The sixth component aimed to increase the usable life of textbooks to at least four years by upgrading domestic capacity for producing more durable textbooks through the use of high-quality paper and better bookbinding techniques. Funding to modernise and upgrade printing and binding equipment and to purchase high-quality paper was provided through two revolving funds, one for on-lending for importing paper, and the other for printing equipment, established under the DFI loan and managed by NBU.

Twelve sub-loans to procure paper totalling $11.0 million and seven sub-loans for procurement of pre-press and printing equipment for $8.5 million were approved. The two revolving funds provided vital
Activities financed through the project loan under this component were only part of the contribution made by the BETDP to improving textbook durability. Noteworthy was the introduction of TRS, with its requirement for durable textbooks and accompanying competitive bidding procedures, which laid the foundation for institutionalising improvements to physical specifications and production of textbooks. A seminar was conducted on textbook production for 30 publishing directors, printers, and production managers, building upon the experience of the study tour. Other activities completed were a seminar on alternative textbook provision policies, and training of 225 district staff members in book repair. At appraisal, the provision of 250 book-repair kits for raion offices and the training of district staff and librarians in book repairs were planned. After training 225 district staff in book repair and providing repair kits to six pilot schools, MOPE reassessed the cost effectiveness and sustainability of book repair applied to new textbooks, which were made with high-quality paper and had modern binding, and concluded that it was not justified. After consultation with ADB, this activity was dropped in 2001. The first three years of use of new textbooks suggested that the usable life of new textbooks would be four years or more.

### B. Project Costs

At appraisal, the total project cost, including taxes, duties, and service charges, was estimated at $106.9 million equivalent, of which $40.2 million equivalent was the foreign exchange cost and $66.7 million equivalent was the local currency cost. ADB provided two loans totalling $40 million equivalent, comprising (i) a DFI loan (OCR) of $20 million to be lent to publishers and printers for upgrading equipment and procuring high-quality paper and cover board; and (ii) a project loan (ADF) of SDR14.455 million ($20 million equivalent) to be used for other project components, including capacity building and purchase of selected textbooks. The two loans were to finance 38% of total project cost. The Government committed to financing the foreign exchange cost of interest and service charges for $7.1 million and local cost of $59.8 million.

The actual project cost was $111.1 million equivalent, comprising $71.8 million in foreign exchange cost, and $39.3 million in local currency cost. Under the project loan, the Government contribution amounted to $72.7 million and incurred no interest or service charges. The Government contributed $2.0 million (82.8%) of the cost for staff development, compared with the appraisal estimate of $0.37 million (17.6%). Appendix 3 compares appraisal cost estimates and actual costs by category and financing sources. Loan savings under staff development, research studies and incremental recurrent cost of the project loan were reallocated to cover (i) the higher than anticipated cost of consulting services resulting from the implementation of the TRS, and (ii) the printing of larger quantities of textbooks than planned at appraisal.

### C. Disbursements

**DFI Loan.** Disbursements amounted to $19.5 million against $20 million at appraisal. Initial disbursements were slow due to delays in start-up activities including establishing appropriate management structures at NBU (para. 33), late delivery of equipment from suppliers, and an initial lack of demand for sub-loans. In June 2003, after unsuccessful reminders to NBU to submit the outstanding audited financial statements (AFSs) for 2000, 2001 and 2002, the Government’s request for loan extension was not approved by ADB, and the undisbursed balance of the loan was cancelled.
on 30 June 2003, the original loan closing date. The time interval for utilising the loan was 58 months. Disbursement is in Appendix 4 (Table 1).

Project Loan. Disbursements totalled the equivalent of $18.91 million, or 94.5% of the loan amount of $20 million equivalent at the time of appraisal. Actual disbursements during the first two years were low, mainly because of the late recruitment of project implementation unit (PIU) staff, delays in the engagement of consultants, and delayed procurement of new textbooks. Other factors were the adjustments to the curriculum necessitated by the introduction of new SES and changes in Government policy to abolish free-state provision of textbooks in January 1998. Anticipated savings of $0.250 million were initially cancelled on 30 June 2004. The unutilised loan balance of 0.277 million was cancelled on 19 November 2004. Disbursement is in Appendix 4 (Table 2).

The Project was provided with an imprest account ceiling of $1 million, but this was not fully utilised because of low turnover. In 2001-2003, turnover was low because the imprest account was used mainly for PIU operational expenses, local workshops, auditing services, and individual international consultants. In 2004, turnover increased significantly when the imprest account was used to pay for textbooks in advance.

D. Project Schedule

Both loans were approved on 17 December 1997 and signed on 23 June 1998. They became effective on 14 August 1998. Certification of availability of $20 million equivalent ADF resources for the project loan was issued only in June 1998 and caused a six-month gap between the approval and effectiveness of both loans. DFI loan was to be implemented over five years, with physical completion on 31 December 2002, and loan closing by 30 June 2003. Initial project activities were delayed due to slippage in the recruitment of the project manager, limited capacity in the management of the two revolving funds to prepare appraisal reports, and business plans of sub-loans, and a lack of demand for sub-loans. Utilisation of the two revolving funds commenced after an international individual consultant, a printing and publishing specialist, was recruited to help NBU assess appraisal reports and business plans of sub-loans, and procure paper and printing equipment in accordance with ADB guidelines. The first sub-loan was awarded in March 2000. Peak disbursement for the two revolving funds was in 2001. A total of 7 sub-loans were granted for equipment and 12 for paper.

The project loan was to be implemented over five years, with the closing of the loan account by 30 June 2003. The Project was initially delayed by slow recruitment of consultants, and the adoption by the Government of the new SES and the abolition of free textbook provision (para. 5). As a result, the first procurement of new textbooks and materials was deferred to 2000. Subsequently, project implementation proceeded smoothly. Two extensions of loan closing date for a total of 15 months were approved to allow for the introduction of a new generation of textbooks and learning materials over 4 consecutive school years. Appendix 5 compares the appraisal and actual implementation schedule.

E. Implementation Arrangements

DFI Loan. NBU was the executing agency for this loan. The Government re-lent the loan to NBU under a subsidiary loan agreement, and NBU was responsible for on-lending to textbook publishers and printers. NBU managed two revolving funds, one to finance the procurement of paper ($11 million) and the other for printing equipment ($9 million), to be relent to financially sustainable, technically, and
managerially capable publishing and printing firms under the agreed-on relending terms.9 Within NBU, two units managed the two revolving funds separately. High staff turnover contributed to inadequate communications between the two units in reviewing sub-loan business plans and appraisal reports, affecting decisions to approve sub-loans. NBU lacked qualified staff to compile financial statements acceptable to ADB. The external auditor gave a qualified opinion of financial statements of the project accounts for 2000, 2001, and 2002, as it was unable to verify the use of funds transferred to MOF.10 NBU did not calculate its debt service coverage ratio as of 31 December 2000 and 2001 as required by the Loan Agreement. However, the less-than-efficient administration of the revolving funds had no significant negative impact on the production and delivery of education materials. In spite of the problems affecting the management of revolving funds, NBU utilised 97.5% of the loan for paper and equipment.

**Project Loan.** MOPE was the executing agency for this loan. Implementation arrangements were established in line with those envisaged at appraisal. A project steering committee, consisting of heads of relevant ministries and agencies, was established for overall coordination and guidance. The project director, who was responsible for internal coordination within the MOPE and for reporting to the committee, changed three times during project implementation. From April 2003, when the second director resigned, the first deputy minister of MOPE coordinated project activities through to project completion in November 2004. The PIU became operational in June 1999, 6 months behind schedule, due to delays in staff recruitment. To guide PIU staff members in ADB procedures and guidelines and on-the-job training in project management, the Project provided an international project implementation specialist for 6 person-months. Overall, the PIU functioned effectively.

**F. Conditions and Covenants**

**DFI Loan.** Among the 19 major covenants listed in the Loan Agreement and the Project Agreement directly related to project implementation, 15 were fully complied with and 4 partially complied with. Covenants with partial compliance include those related to the regular reporting of funds transferred to MOF, reporting to ADB on operations of the revolving funds including conditions that affect sub-loan performance, subproject performance monitoring, and maintenance of debt–equity ratio. AFSs for 2003 are yet to be submitted. Compliance with covenants is in Appendix 6.

**Project Loan.** Eleven out of 12 main loan covenants were complied with on time. There was a two-month delay in establishing the textbook development working group, causing delayed compliance with the covenant concerned. Quarterly progress reports were submitted on time and regularly with the exception of the first one covering October 1998 to March 1999. Submission of AFSs was generally on time, except for 1998 when submission was delayed by 1 year because there were no transactions during the year. The financial statements for 1998 were audited together with those for 1999. No covenants were modified, suspended or waived. Compliance with covenants is in Appendix 7.

**G. Related Technical Assistance**

Two advisory TA projects were associated with the BETDP. TA 2947-UZB developed a functional education reform monitoring system that provided relevant and timely reports to policy makers, a database containing updated information on key indicators, and conducted a series of seminars to examine the status of reforms. Main lessons learned include the importance of providing long-term support to achieve institutional change and lasting impact, including changes pertaining to information sharing and transparency. The TA was rated as partly successful. The TA completion report is in Appendix 8.
TA 2948-UZB identified strategies for improving the cost-effectiveness and efficiency of the education system. It carried out a review of public spending on education, assessed the financial sustainability of the NPPT, recommended funding strategies and contributed to strengthening the financial management and policy analysis skills of key personnel. Capacity building activities included the introduction of economic concepts used in modern education planning, training a core of national experts in methodologies and techniques for data processing, and analysis and provision of international exposure to senior officials in education reform processes. The TA was rated as successful. The TA completion report is in Appendix 9.

H. Consultant Recruitment and Procurement

Consultant Recruitment. Consulting services were provided for all six components of the BETDP. Selection and engagement of the consulting firm and individual consultants was carried out in accordance with ADB’s Guidelines on the Use of Consultants. The value of the consulting contracts exceeded the budget allocated at appraisal and required reallocation of funds. In February 2002, following a Government decision to implement the TRS and refocus expert services toward fewer subjects, variations were introduced to the main contract. A total of 160.9 person-months of consulting services, comprising 56.9 person-months of international consultant and 104.0 person-months of domestic experts, were utilised compared with the 116.0 person-months planned at appraisal. The increase was mainly due to the introduction and implementation of TRS, which was not anticipated at appraisal.

One short-term individual consultant, a specialist in project management, and monitoring and evaluation (6 person-months), was recruited under the project loan to assist the PIU. Anticipated and actual consultant services are compared in Appendix 10.

Training. The BETDP envisaged training of 12,777 teachers, school principals, curriculum designers, authors, publishers and printers, school librarians, and district staff members. Three times as many (38,831) were trained. Quantitative outputs for in-service teacher training were 160% the appraisal estimates. Staff development activities are in Appendix 11.

Procurement of Goods. Procurement of goods under DFI loan was done in compliance with schedule 2 of the Loan Agreement, which covers, among other things, the eligibility of goods, reasonableness of prices, and reliability of goods. All procurement contracts were awarded through transparent competitive bidding, and approved by a procurement tender committee as was the case for Loan 1595-UZB (SF).

Procurement under the project loan was carried out in accordance with the appraisal plan and ADB’s Guidelines for Procurement. While the Loan Agreement stipulates local competitive bidding for textbook procurement, MOPE took significant steps to introduce a broader competitive textbook procurement system by adopting international competitive bidding procedures. Measures introduced by MOPE include (i) the introduction of royalties and fee negotiations of authors’ remuneration, including for example a fixed sum for manuscript preparation; (ii) open competition between publishers for manuscript preparation; and (iii) adoption of competitive bidding for printing and publishing work. Appendix 12 compares the appraisal plan with actual procurement. Inefficient Government approval procedures and inadequate interagency coordination resulted in substantial delays in preparing bidding documents and bid evaluations. There were no other significant problems with procurement during implementation.
I. Performance of Consultants, Contractors, Suppliers, and Sub-borrowers

Consultant performance under the DFI loan was satisfactory. Consultants fulfilled their terms of reference in helping NBU assess appraisal reports and business plans, manage revolving funds, and procure paper and printing equipment in accordance with ADB guidelines.

Sub-loan performance was generally satisfactory. To date, one of the seven sub-loans funded by ADB under the revolving fund for equipment is in delinquency. The total overdue payments, including interest and principal, amounted to $1.93 million against total loans of $8.5 million. Of the 12 sub-loans funded by ADB under the revolving fund for paper totalling $11 million, one is in delinquency, with $0.27 million in overdue interest and principal payments. Reasons for late repayment of sub-loans include (i) sub-borrowers’ mismanagement, (ii) increasing competition in the printing industry, and (iii) late delivery of equipment by the supplier.

The performance of consultants under the project loan was highly satisfactory, particularly with respect to their work organisation, timeliness of delivery, quality of outputs, and work relationship with counterpart staff and MOPE. The support to introduce the TRS was greatly appreciated by the Government, and facilitated the effective technical transfer of expertise to MOPE staff members responsible for the TRS.

The performance of printers and publishers of textbooks as well as suppliers of paper and printing equipment was considered satisfactory. In some instances, late delivery of learning materials was penalised. The funds recovered were reinvested in additional learning materials.

J. Performance of the Borrower and the Executing Agency

DFI Loan. The Borrower substantially met its financial obligations. NBU took longer to reach the expected level of performance. In spite of shortcomings in project management practices, staff retention, preparation of financial reports, and monitoring of financial covenants, both revolving funds were almost fully utilised and provided vital and intended support to printers and publishers through sub-loans. At the closing of the loan in June 2003, NBU had granted 7 sub-loans for equipment ($8.5 million) and 12 for paper ($11.0 million). The revolving fund was kept operational and up to date, and five more sub-loans for paper were granted totalling $4.8 million, using the funds paid back from sub-borrowers. The overall performance of NBU was considered partly satisfactory.

Project Loan. The Borrower implemented the project loan on time despite initial delays. MOPE’s performance was highly satisfactory as exemplified by its innovative introduction of the TRS in response to a changing policy environment. Compliance with loan covenants, including submission of progress reports and AFS, was satisfactory. Throughout implementation, the Borrower, MOPE, the PIU, and consultants coordinated closely with each other. Considering their initial lack of familiarity with ADB guidelines and procedures, and the complexities of the BETDP, PIU staff members, with the support of consultants, performed beyond original expectations. MOPE, particularly toward the second half of project implementation, demonstrated strong commitment to the project purpose and objectives, as well as leadership in implementation. The delivery of textbooks and learning materials and the training of teachers exceeded appraisal targets.
K. Performance of the Asian Development Bank

ADB’s performance was satisfactory. During project implementation, from October 1998 to September 2004, ADB fielded six review missions, including inception and midterm review missions. The focus of ADB supervision was on implementation progress, identification and resolution of problems, and general project management issues. Toward the end of the Project, there was a gap of 19 months in field supervision due to staffing constraints. During this period, more intensive support was provided through telephone and electronic mail. The assistance provided by ADB missions and the Uzbekistan Resident Mission, especially during the recruitment of consultants, approval of the TRS, and resolution of implementation issues, contributed significantly to successful implementation. ADB maintained a cordial working relationship with MOPE and NBU, which provided a good basis for policy dialogue on capacity building and sustainability issues.

III. EVALUATION OF PERFORMANCE

A. Relevance

The objectives of the BETDP were consistent with the education sector’s most urgent priorities and with ADB’s assistance strategy for Uzbekistan and the ADB’s education policy August 2002. The Project has significantly improved textbook provision and paved the ground for establishing a sustainable and affordable system of textbook provision, thus contributing to effective schooling from the perspective of teachers, pupils, and parents, and the Government’s reform priorities. The BETDP’s design proved to be robust, in that it was able to accommodate, without major changes in design and implementation arrangements, changes necessitated by the Government’s abolition of free textbook provisions. However, the project design could have emphasised monitoring and evaluation more. In retrospect, MOPE’s decision to implement the TRS, and to provide additional resources to the Project was appropriate and enhanced the relevance of project design. The DFI loan was also designed to address urgent issues facing the publishing and printing industry. Based on these considerations, the BETDP is rated as highly relevant.

B. Efficacy in Achievement of Purpose

The BETDP is rated efficacious. It addressed major concerns of basic education and attained its goals. By project completion, new textbooks and better teachers’ guides were made available for the core curriculum in sufficient numbers and at affordable cost to teachers and pupils in all schools. Through the TRS and the proposed creation of a foundation to handle its administration, the BETDP established a financially and institutionally sustainable basis for a system for provision of affordable textbooks. The introduction of a transparent and competitive textbook procurement process stimulated the development of local textbook publishing capacity, and the market conditions for continuing development of new and better textbooks. This capacity to get learning material to schools in a timely, comprehensive and efficient manner will substantially facilitate on-going efforts to improve education quality, including implementation of continuing curriculum reforms.

In-service training under the BETDP equipped teachers with a new didactic form of teaching and gave them confidence by providing new syllabi for six subjects, new textbooks, and teacher guides. There is now widespread recognition of the need for changing approaches to education, not only in terms of structures and regulations, but more fundamentally, concerning what goes on in schools and classrooms. Moreover, through exposure to international practices and its own experimentation, MOPE has greatly increased its evaluation capacity. The BETDP helped MOPE learn and acquire
considerably better knowledge and skills to steer and manage the on-going sector reforms, and MOPE has a better understanding of the need for strategic thinking and monitoring of implemented policies. Finally, training provided under the Project helped broaden the pool of experts within the education system who are available for education reform work and advising schools on how to cope with the new expectations.

MOPE especially benefited from the knowledge and skills relating to its advisory and regulatory function of textbook authoring, publishing, and distribution and professional development of teachers. Project activities, including those relating to curriculum improvement and new teaching methodologies, combined to foster a gradual but visible change in attitudes, which is of long-term significance. At project completion, many teachers supported, and had an understanding of the need for, curriculum development, and MOPE officials refer to curriculum reform as a key means to transform education to meet the needs of a modern society. These combined are expected to have had a positive impact on learning and teaching outcomes, although specific statistics on these outcomes are not available. Institutionalised competitive bidding helps to ensure that textbook production and quality meet emerging demands. The DFI loan helped publishers and printers produce quality textbooks and other learning and teaching materials.

C. Efficiency in Achievement of Outputs and Purpose

The BETDP is rated as efficient in attaining its intended outputs and purpose cost effectively. This was accomplished through substantive improvements in the quality, durability, and availability of textbooks, and efficiency in textbook production and supply system, which considerably reduced costs. Other tangible outcomes were strengthened policy and institutional frameworks and knowledge through experimentation in developing a responsive education system. The project scope, outputs, and activities remained unchanged during implementation, with the exception of support for the introduction of the TRS, which was not anticipated at appraisal.

Financial and human resources were efficiently utilised for capacity building in curriculum development, improving the availability and quality of textbooks, using learning materials, improving the quality and efficiency of textbook production, and increasing the supply of textbooks. NBU almost fully utilised the DFI loan, although its administration of revolving funds did not show adequate fund management capacity. The Project significantly increased textbook supplies, averaging 10.4 textbooks per pupil nationwide at project completion, as compared with two or three students sharing one textbook before the Project. Similarly, printing and distribution costs for textbooks were considerably reduced. At appraisal, the estimated unit cost of a printed book and the distribution cost as a percentage of production cost were $1.63 per copy, and 11%, respectively. In SY2004 the average unit cost of textbooks for grades 1–9 dropped to $1.35 and the distribution cost was reduced to 8.4% of production cost. The Government provided, out of its own resources, an additional $8.09 million for textbooks and learning materials and $1.66 million for staff development.

D. Preliminary Assessment of Sustainability

The BETDP is rated most likely sustainable for the following reasons:

Financial Sustainability and Fiscal Impact. The introduction of TRS under the Project laid a solid foundation for sustainable provision of affordable textbooks to all students in basic education. Experience indicates that the basic design of TRS is financially sound, which makes rental fees affordable to most parents. This is reflected in the high collection rate of rental fees. On average,
about 15% of students are unable to pay the rental fees. These students are financed by the Government from its budget. Four years of Government and donor investment in start-up textbook rental stock will create the fee income needed to maintain the TRS on a sustainable basis. This is estimated to save the Government around $230 million in total at current costs over the period of loan repayment. The subsidy to the 15% poor students at about $2 million a year amounts to less than 0.3% of total Government expenditure in the education sector, with no significant fiscal impact. The financial sustainability established laid the foundation for, and will be further strengthened by, the Second Textbook Development Project (STDP) supported by ADB (footnote 5), which has been under implementation since November 2004. Financially, the DFI loan is most likely sustainable due to its revolving nature.

**Policy Reform.** The policy reform process initiated with the BETDP is considered sustainable. The policy measures envisaged at appraisal were achieved, and the BETDP has been an important link in the chain of education reforms in the country. Among the key achievements are ensuring the availability of affordable textbooks, and the introduction of transparent competitive bidding for education materials, which was subsequently institutionalised. TRS innovations provided a firm foundation for institutional changes that affect education officials at all levels, parents, pupils, publishers, authors, and distributors. The knowledge acquired by MOPE through experimentation with new models and ideas in developing the education system considerably strengthened the education sector reform and its institutional framework. The STDP is benefiting directly from these improvements and will carry them forward. With regard to the DFI loan, policy reforms were slower and further progress in liberalising the publishing and printing industry would be desirable.

**Institutional Arrangements.** The BETDP has laid the foundation for a sustainable, institutionalised system of nationwide provision of textbooks. The system includes textbook production based on competitive bidding, wider sourcing of authors, and a pool of trained textbook evaluators in most subjects. At the core of the system is the TRS that has proved to be institutionally appropriate, effectively managed and financially sound. A draft charter for the RTRFF has been prepared and will be registered upon issuance of a Government resolution on establishing the foundation. The RTRFF will significantly strengthen TRS as an institution based on transparency, accountability, participation (especially by schools and parents), and financial prudence. A fully functional RTRFF under these principles constitutes the cornerstone of the STDP, and will be further strengthened by it.

**E. Environmental, Socio-cultural, and Other Impacts**

The impact of the BETDP is rated as substantial. The BETDP had no adverse impact on the environment. On the contrary, the BETDP contributed to capacity development in environmental education through workshops for teachers and authors, including holding a national water-saving competition for schools to raise awareness among teachers of environmental education. The BETDP contributed to the education of ethnic minorities by making available a total of about 0.7 million new textbooks in Kazakh, Kyrgyz, Tajik, Turkmen, Russian, and Karakalpak minority languages, which is about three textbooks for each minority language pupil in grades 1 to 4 nationwide. Outside the school environment, the Project promoted market-oriented authoring, publishing, and distribution operations.

**IV. OVERALL ASSESSMENT AND RECOMMENDATIONS**

**A. Overall Assessment**
The BETDP is rated highly successful (Appendix 13). It was well conceived, comprehensive in its approach, successfully implemented as designed, and supported the successful introduction of the TRS in response to a changed policy environment. Project implementation followed the concepts developed at appraisal and improved on them. It produced a satisfactory impact in the education sector which is likely to sustain and support ongoing reforms. Virtually all quantitative targets (teachers trained, new curriculum developed, number of textbooks, teacher guides) were achieved, and some exceeded. The Project introduced new thinking and practices in MOPE, which has continued to benefit ADB operations in basic education as well as contribute to cumulative progress in the education sector reforms.

B. Lessons Learned

A particular strength of the Project was that the objectives were firmly based on Borrower’s priorities and on stakeholder assessment conducted during the preparatory phase and considerable direct consultation with beneficiary groups. Related to this was the demonstrated strong Government commitment to the purpose and objectives of the BETDP. Project ownership was evident among the senior management of MOPE and MOF and helped resolve implementation problems and ensure its success.

The BETDP did not provide for the systematic gathering and analysis of data on the project impact, including effectiveness of teaching and learning in schools before and after the intervention. For future projects, a system to collect and maintain data, and to monitor and analyse quantitative and qualitative outputs and impacts should be built into project design.

The introduction of SCL is a paradigm shift in Uzbekistan. Given the former rigid educational environment, which focused on learning facts rather than acquiring skills, the understandable scepticism among teachers and trainers about SCL and the relative inexperience of counterparts with hands-on experience on SCL are changing. Ideas of interactive learning methods discussed during in-service training sessions were far more often referred to by teachers than the actual improvement of selected syllabi as primary outcomes of the Project.

At appraisal, it was not foreseen that a large amount of paper would need to be imported using foreign exchange. In reality, about 50% of total costs of textbook production was attributable to the cost of imported paper. As a result, the Government shared significant project funding in foreign currency (Appendix 3). Future project design should ensure accurate estimates of the need for foreign exchange and avoid unnecessary burdening of the Government with foreign currency financing.

C. Recommendations

DFI Loan. The Government should be encouraged to continue the revolving fund modality instituted under the Project to benefit printers and publishers of textbooks and learning materials in the procurement of paper and equipment. Considerable macroeconomic changes, including the unification of the exchange rates, have taken place over the past few years. It is necessary to review the design of the funds to reinvigorate sub-borrowers’ interest, and make on-lending competitive and sustainable, as well as to incorporate lessons learned in strengthening fund management.

It is recommended that ADB (i) closely monitor the submission to ADB of AFSs for 2003, which were outstanding at the time of the PCR mission, and which NBU committed to submit by July 2005; (ii) closely monitor the functioning of the revolving funds, given that the effective functioning of the
revolving funds is essential to the successful development of the textbook sector; and (iii) incorporate the review of the revolving funds as part of the midterm review of the STDP, currently under implementation.

**Project Loan.** MOPE should prepare indicators for monitoring the qualitative impact on learning and teaching effectiveness and update them regularly with agreed-on intermediate and process benchmarks. These indicators should be used for evaluating the effectiveness of the new textbooks and other training materials.

To further reduce the costs of textbooks and learning materials, MOPE should introduce unrestricted and transparent competitive bidding for delivery of education materials to schools as a matter of priority.

MOPE should give continuous support to train talented practicing teachers in design and content of new teaching syllabi and manuscript development, editing, and evaluation.

**General.** To support the Government’s institutionalisation of competitive bidding for education materials, ADB should provide periodic training to members of various procurement committees in design of bid documents, bid evaluation criteria, bidding and evaluation of bids, and the management of the competitive bidding process.

To further improve quality and reduce costs of education materials production, targeted actions are required by the Government to update legislation regarding copyrights, and further liberalise publishing, printing, and distribution industries.
Adopting a Textbook Rental Scheme means giving to schools the responsibility and authority to manage the textbook needs of their pupils. Under a Rental Scheme, schools issue and collect school-owned textbooks, collect rental fees from pupils/parents, record and bank the fees, maintain records of all transactions and monitor the use and care of the rented textbooks to achieve a maximum book life (four years average). The accumulated funds are used to purchase replacement textbooks at the end of the four-year period.

A Revolving Fund is the fund in which the textbook rental charges are accumulated until replacement textbooks are required. Usually, the collected monies are held in bank accounts in the school's name, which are controlled by a school-based committee. Over a period, the revolving fund will become a permanent school textbook fund, which is replenished regularly to cover the cost of all textbook replacement. Schools thus become the purchasers of most of the new textbooks they require on an annual basis.

Unwaged or disadvantaged parents cannot afford to pay rental fees for their children's books. To maintain the fund and to ensure these children are supplied with textbooks, the Ministry or local education authority makes an appropriate financial contribution to the fund, which is accumulated along with parental contributions. Teacher's own copies and Teacher's Guides may also be funded in this way. Otherwise, the rental charge on parents who are not disadvantaged has to be increased.

Pre-requisites of a rental scheme:

1. There should be a complete initial stock of textbooks supplied to the schools in the scheme free-of-charge (start-up capital).
2. Legal authority is given to schools to deposit (and withdraw) funds in a dedicated bank account.
3. Facilities in the school library or classrooms are needed for the storage of textbooks.
4. A School Textbook Board needs to be in place in each school in the Scheme with the appropriate authority and constitution.
5. The regional Education Office of the Ministry needs to have the authority to inspect the operation of the fund.
6. The Librarian or other senior teacher/head teacher needs to agree to supervise and carry out the day to day operation of the scheme and to have these responsibilities written into their job description.

Administration: Draft but detailed documents and forms can be made available to cover: the administration of a scheme, including the issuing, checking and collection of textbooks; the collection, recording and banking of fees; and the safekeeping and maintenance of the books themselves. Any
scheme also requires the careful calculation of the fee to be charged, the timing of its levy and any other supplementary funds to be collected. Such calculations should initially be done by the Ministry and based on the average cost of textbook replacement plus inflation. The Ministry will also be responsible for training in the scheme, information transfer and publicity as well as monitoring and evaluation. All these functions carry a cost.

The aim of a rental scheme is usually to achieve complete cost recovery of a given set of textbooks over a period of four years. To achieve this, an average of 27.5% of the original cost of the textbooks needs to be levied each year over the four year life of the book. This is above the expected level of 25% and takes account of some unrecoverable loss and replacement of books during the four year period plus a provision for inflation when the new textbook is purchased. This calculation does not include the replacement cost of textbooks for socially unprotected children.

A rental scheme as applied in Macedonia

In the World Bank loan-funded textbook component covering language and mathematics in Grade IV, it was envisaged that a pilot rental scheme in 40 primary schools would be organised around the free-of-charge provision of around 5000 copies of the new textbooks when they were published in September 1999. These textbooks would form the basis (or the textbook ‘capital’) for a scheme in which an annual rental charge of 50 Denars would be levied on each book over a four-year period. The objective was to test whether such a system was acceptable and workable with parents and teachers. An evaluation of the first year’s experience of the scheme may have been sufficient to prove the robustness of this system of income generation, and in turn may have been sufficient to inform the Ministry as to whether or not to proceed with a countywide scheme. As it was, the rental scheme part of the project was not implemented.

There still exists the opportunity of putting in place a similar pilot scheme, but based on copies of textbooks recently distributed from the remnant World Bank funding disbursed at the end of 2000. Alternatively, some of the textbooks supplied free-of-charge by the Ministry to schools in September 1999 could form the basis of a much larger and more serious income-generating pilot. This second option is more contentious and may not be acceptable for a number of reasons: the books are already two years old and have been lent free of charge to date with no fee to parents; their life span would not be sufficient to generate enough income for their replacement. A further alternative would be for the Ministry to fund the supply of a number of copies of textbooks especially for the pilot.

Whichever option is chosen, the MOE must recognise that while the pilot may achieve its objective in testing the system, in itself it will have only a small impact on the long term issue of how to generate enough income to fund the whole primary level textbook requirement. It is only when the piloted system is applied to all primary schools in Macedonia that serious cost recovery will result and a true revolving fund established.

But for a full scheme to be implemented, the Ministry still faces the problem of how to provide the start-up capital of free-of-charge books for the scheme. There are only two alternatives: (a) the books are purchased by the Ministry, or (b) loan funding is sought as part of a new education reform plan.

For a pilot rental scheme to be in place in schools in September 2001, plans need to be laid in February 2001 and an implementation timetable and action plan agreed with the implementing bodies as soon as possible thereafter.
It is proposed that a Planning Forum be held in early March to review the proposed implementation of a rental scheme. The MOE regional organiser in Bitola should be invited to this Forum to present the experience of implementing rental schemes in that region.
Principles and processes for publishing textbooks and alignment with standards: a case in Singapore

Abstract: Mainly drawing on the author’s experience in textbook development for Singapore schools and research in this area, this paper presents six principles and discusses relevant processes for developing mathematics textbooks. These principles include curriculum principle, discipline principle, pedagogy principle, technology principle, context principle, and presentation principle. For each principle, the author briefly explains what it means, why it is important, and how it can be implemented for the development of mathematics textbooks.

Key Words: Singapore mathematics; Mathematics curriculum; Textbook development

Over the last 15 or so years, Singapore students’ outstanding performance in mathematics in large-scale international comparative studies has generated considerable interest among educational researchers and policy makers in its approaches to school mathematics education. Its modern mathematics textbooks, as a most important resource in support of teaching and learning in mathematics classroom, have also received much attention. In fact, Singapore school mathematics textbooks, considered to some extent as exemplary ones, have been adopted, with or without modification, in quite a number of economies over the last decade (e.g., see Quek, 2002). Having said this, I must add that, as researchers have found, there is still much room in Singapore mathematics textbooks for further improvement (e.g., see Ng, 2002; Fan & Zhu, 2007).

In this paper, I shall propose six inter-related principles and discuss relevant processes for developing (publishing) mathematics textbooks. For brevity, these basic principles are termed curriculum principle, discipline principle, pedagogy principle, technology principle, context principle, and presentation principle, respectively, as shown in Figure 1 below. For each principle, I shall briefly explain what it means and/or signifies, why it is important, and how it can be implemented for the development of mathematics textbooks. The discussions are mainly based on relevant research work I, and my co-researchers, have done (e.g., see Fan & Zhu, 2000, 2002, 2007; Ng, 2002; Lee & Fan, 2004), and personal experiences I gained as consultant/editor- in-chief for both primary and secondary mathematics textbooks over the last ten years. In particular, when it is helpful I will draw on examples in the new series of secondary school textbooks, New Express Mathematics (see Fan, Cheng, Dong, Leong, Lim-Teo, Ng, et al., 2007, 2008), to illustrate my discussion.

It should be noted that Singapore is an island city-state and has a highly developed economy with a GDP per capita of US$38,904 in 2008 (Source: Singapore Department of Statistics). It has a population of about 5 million and an area of about 700 square kilometers. Chinese, Malay, Tamil, and English are all official languages, but English is the most widely used working language and the medium of instruction in schools. Singapore adopts a highly centralized education system.

**Principle 1: Curriculum Principle**

The curriculum principle requires that textbooks must be developed for the implementation and realization of intended curriculum.

In a broad sense, curriculum is a course of study, or all the experiences a student will have and achieve in school. School textbook developers (or authors/writers) must have certain “intended” curriculum, explicitly or inexplicitly, in their minds before they develop their textbooks.

In modern societies, because of a variety of reasons and needs, many (if not all) economies have developed so-called national curriculum (syllabus or standards) for school mathematics. In Singapore, like in many other Asian economies, national mathematics curriculum (syllabus) is developed and issued by the Ministry of Education (MOE), and all schools are required to follow the syllabus in teaching, learning, and assessment. Accordingly, textbooks must align themselves with the syllabus. Below is the well-known Singapore mathematics curriculum framework, also known as pentagon framework, stated in the national syllabus (MOE, 2006a, 2006b).
To align textbooks with the curriculum in terms of the coverage of contents, as roughly reflected in “Concepts” and “Skills” in the pentagon framework and detailed in the syllabus, is important and, relatively, easy. What is more challenging is for textbooks to reflect other aspects that the curriculum intends to achieve, for example, developing students’ high-order thinking skills, critical thinking skills and creativity, and positive attitudes towards mathematics, etc. In fact, Ng (2002) found that the whole series of primary textbooks developed by CDIS (see below) only introduced 11 out of the 14 problem solving heuristics listed in the syllabus. Similar inconsistency was also found in secondary mathematics textbooks for the lower grade level, i.e., Grade 7 and Grade 8 (Fan & Zhu, 2007).

As textbooks are essentially textbook developers’ own interpretation and reflection of the intended curriculum in the process of textbook development, they must study and hence establish good knowledge of the curriculum, and more importantly, work together and get information and feedback from curriculum developers.

With regard to the alignment of textbooks with national curriculum, as pointed out by Kho, who is a most senior curriculum specialist of MOE, during an interview conducted as a preparation for this paper, an exceptional case in Singapore was that in the 1980s and early 1990s, all the primary mathematics textbooks and a set of secondary mathematics textbooks were developed by two specially appointed teams who also developed the syllabus in the Curriculum Development Institute of Singapore (CDIS) under MOE (Kho, personal communication, Jan. 31, 2010). In other words, the curriculum developers are also textbook developers.

Since the mid 1990s, due to a number of reasons the development and publication of textbooks have been decentralized in Singapore. Nevertheless, the curriculum developers have always maintained
very close working connection and interaction with the textbook developers though a variety of activities and channels, including curriculum briefings (e.g., see Mathematics Unit, 2004, 2005), seminars, and meetings. More importantly, all school textbooks in Singapore must be reviewed and approved, primarily based on the curriculum, by an evaluation committee appointed by the Ministry of Education before they can be published and used in schools, and understandably, the curriculum developers have always played a leading role in the evaluation committee. In addition, the textbook developers must revise their textbooks according to the feedback given in the review report. I think these practices have worked very successfully in Singapore and are worth recommendation.

**Principle 2: Discipline Principle**

There is no doubt that mathematics is a very mature and well-established scientific or academic discipline. The discipline principle requires that school mathematics textbooks must provide a solid foundation for the students to understand, apply, and study mathematics in their daily life, further learning and workplace. In terms of content, textbooks must correctly present mathematics knowledge (including mathematical concepts, facts, and methods, etc.). Furthermore, also more challengingly, textbooks should properly represent and reflect the nature, the structure, and epistemology of mathematics as a discipline.

The importance of the discipline principle in developing textbooks is easy to see, but to implement it is not as easy as people might think. Many studies on textbooks have indicated a surprisingly large number of cases in which the textbooks presented the content improperly or incorrectly (e.g., see Levin, 1998).

My own experiences in textbook study and development also suggest that many problems found in textbooks are technical and can be corrected easily, but there are still many which are non-technical or conceptual and they pointed to the problems or weakness in the knowledge base of the textbook developers.

Just to give one case, I shall use an example in the topic of synthetic division in algebra. Many advanced school and college algebra textbooks explicitly stated that this method is only applicable to a divisor in the form of \( x-a \), and it cannot be extended to a divisor being a polynomial with degree higher than 1 (e.g., see Larson & Hostetler, 1997), which is incorrect.

In connection with this topic, to introduce the long division as shown below, some textbooks place the quotient at the top of \( 0x^3+2x^2 -7x-10 \) instead of \( 5x^5 +13x^4 +0x^3 +2x^2 \). Although either way will produce the correct answer at this level, the former will hinder students' further learning about how the method can be generalized for other kinds of divisors with degree more than 1, and hence latter expression should be used (for more details about the synthetic division and its generalization, see Fan, 2003).
From the fact that numerous studies have consistently revealed that many mathematics teachers don’t have sufficient knowledge for effective teaching of mathematics (e.g., Carpenter, Fennema, Peterson, & Carey, 1988; Fan, 1998; Ma, 1999), the situation here is not surprising, although it should be noted that virtually no study has been done about what knowledge textbook developers need and have. This is worth attention from researchers as well as policy makers.

With regard to the discipline principle, it is clear that textbook developers must have a sound knowledge base in mathematics as a discipline. It is also very helpful, whenever possible, to have mathematicians in the textbook development team, particularly for secondary and higher level textbooks. In fact, in a latest series of secondary mathematics textbooks (of which I served as chief editor), 10 of the 16 my fellow developers (authors) are trained mathematicians, holding PhD degrees in mathematics from reputable universities. It makes us have more confidence in claiming that one of the key features of the textbooks is, “content is mathematically sound” (Fan, et al., 2007, 2008).

Another relevant point is that textbook developers must carefully collect feedback from the teachers and students after they have used the textbooks. Many times, the problems and mistakes in textbooks cannot be totally detected until they are really used in schools. It implies that textbook development should be ideally an ongoing process.

Having textbooks reviewed, especially by mathematicians and school teachers, is also important in terms of this principle. In Singapore, as Kho pointed out, being mathematically correct is one of the basic criteria for the reviewers to make recommendation for the approval of the textbooks (Kho, personal communication, Jan. 31, 2010), and the textbook developers must correct the mistakes and address the concerns, if any, raised by the reviewers in this aspect.

**Principle 3: Pedagogy Principle**

The pedagogy principle requires that textbooks must be developed to facilitate the teaching, learning, and assessment in mathematics.

As Fan and Kaeley (2000) indicated, textbooks as a learning tool or resource can convey different pedagogical messages to teachers (and students) and provide them with an encouraging or discouraging curricular environment, promoting different teaching (and learning) strategies. In fact, available studies have consistently revealed, textbooks can, to different extent, affect not only what to
teach, but also how to teach, which will ultimately affect students’ learning in mathematics (Zhu & Fan, 2002; Fan, Chen, Zhu, Qiu, & Hu, 2004).

In usual, the pedagogical orientation can be provided in the textbooks implicitly, but sometimes it is helpful to make some pedagogical messages explicit. For example, in New Express Mathematics, the authors labeled some sections with headings such as “Let us try”, “Looking back”, “In-class activity”, and “Project task” to make the message about the learning and learning process more explicit. For assessment, the textbooks classified mathematics questions into Group A, B, and C. Journal writing tasks and other kinds of so-called alternative assessment tasks are also provided in the textbooks (Fan, et al., 2007, 2008).

Regarding this principle, as found in the case of Singapore, textbook developers are often given more room to be flexible in pedagogical matters. It is important that textbook developers keep abreast with the new development of the practice, theories, and research in pedagogy and learning. It is also very helpful to have mathematics educators and mathematics teachers in the textbook development team, particularly for developing the textbooks for students at lower grade levels. While mathematics educators have strengths in pedagogical theory and research, school teachers often know better the practices and needs of teachers and students in schools. In New Express Mathematics mentioned above, all the other authors are mathematics educators, and most of them have school teaching experiences (Fan, et al., 2007, 2008).

It is worth mentioning that in the process of developing the primary mathematics textbooks by CDIS in the 1980s, as said earlier, all the content and activities designed by the project team, which was led by Kho, were piloted in classrooms in a number of schools which volunteered to participate in the trial, and then revised according to the feedbacks from the try-out before they were finalized and published. According to Kho (personal communication, Jan. 31, 2010), this process was unique and very effective for the developers to make sure that the textbooks being developed would be suited to the needs of teaching and learning in classrooms.

Having textbook reviewed by mathematics educators, or pedagogical experts, and school teachers before the textbooks are published and listening to teachers’ feedback after publication is also important for improvement with respect to the pedagogy principle.

**Principle 4: Technology Principle**

The meaning of technology in mathematics education has expanded over the time, from calculator, to calculator and computer, and now more commonly to information and communication technology (ICT).

About 15 years ago, I criticized, with good intention, that mathematics education including textbooks in China was largely isolated from modern technology and there was virtually no existence of technology in the mathematics textbooks (Fan, 1995). I must say that this criticism is no longer valid, as China has made dramatic progress in this aspect in the new wave of curriculum reform, most visibly in the new textbooks developed. In Singapore, much progress has also been made over the last decade or so.

Undoubtedly, the advent of modern technology has produced significant influences on our modern society. In the field of mathematics education, technology has affected what to teach and how to teach, and moreover, why to teach. In relation to this, technology must be reflected and, more importantly, embedded into the teaching and learning of mathematics. Textbooks, as a most important
pedagogical resource, must integrate technology to support and facilitate the teaching and learning of mathematics. With the rapid development of technology, it appears apparent that technology will play an increasingly important role in the next generation of mathematics textbooks.

Let me briefly share some examples in the case of New Express Mathematics to illustrate how the technology principle is, to different extents, reflected in the textbook development. The first example is, in the older mathematics textbooks of which I was also a consultant/general editor, the approximate value of \( \pi \), most commonly not the case in the new textbooks, because all students are expected to use calculators, in which keying in 22/7 is not only redundant and less accurate, but also less efficient than directly keying in the symbol "\( \pi \) or \( \text{pi} \)" (similar idea applied).

Another example is that, as all students in Singapore are expected to have access to ICT including calculators, computer and internet, the textbooks developers have developed more authentic and challenging problems including investigative and project tasks. In working on these problems, students will focus more on conceptual understanding, information gathering, logical reasoning and data analysis, and so on, rather than tedious calculation, complex algebraic manipulation, or time-consuming drawing, etc. By doing so, technology can make mathematics teaching and learning not only more efficient, but also more effective. In fact, many questions in the textbooks that are targeted to develop students' high-order thinking and problem solving abilities are ICT-embedded.

In addition, many topics covered in the textbooks, especially those in geometry (e.g., for measuring and construction) and statistics (e.g., for statistical diagrams, graphical representation and data analysis), were introduced with the use of available mathematics software to facilitate students' learning (Fan, et al., 2007, 2008).

The technology principle requires that the textbook developers be familiar with the development of technology. In particular, having experts in the use of ICT in mathematics teaching and learning on board would be most helpful in this aspect. In addition, feedback from teachers and students is also helpful with regard to this principle.

Finally, I shall very briefly mention context principle and presentation principle. Although I think in some sense they are less important and more technical compared to these described earlier, they are still worth reasonable attention in textbook development.

**Principle 5: Context Principle**

School mathematics textbooks are not research publications for pure mathematics, which can be almost completely abstract. School mathematics is often contextualized, and cannot be free from the social and cultural background, under which school education takes place.

The context principle requires the textbook developers provide adequate cultural, social and even historical contexts when introducing mathematics concepts and contents. This principle is particularly important when application of mathematics is concerned. In the case of New Express Mathematics, many examples and problems use Singapore's local context as background. For example, they use authentic information about Singapore's geography (e.g., for distance, speed, and time), demography and economy (e.g., for statistics), architecture (e.g., for geometrical shapes), and society (e.g., social welfare and public housing system for financial mathematics). The contextualized information is provided to motivate and engage students in their learning of mathematics as they are familiar and can make connection with the contexts. In this sense, as it is found in the case of Singapore mathematics
textbooks, modification or localization of the textbooks is necessary when they are developed in one economy but used in other economies.

The context principle requires the textbook developers have reasonable knowledge of local contexts. Having local mathematics education experts and school teachers in the development team is important in this aspect. Searching information from local newspapers and other sources can also be very helpful.

**Principle 6: Presentation Principle**

This principle requires that the presentation of the contents in textbooks must suit the level and needs of teaching and learning. This principle is meaningful in the textbook development as well-designed presentation can make the reading and use of textbooks easy and pleasant, and facilitate teaching and learning.

The principle is more about the technical aspects of developing and publishing a textbook, “design and physical features”. In Singapore, the mathematics unit of the Ministry of Education once recommended the following four aspects for textbook developers/publishers to consider: 1. Real-life pictures and realistic drawings, 2. Clear layout and illustrations, 3. Use of colors, and 4. Simple language. (Mathematics Unit, 2004).

Largely consistently, in developing the series of New Express Mathematics, the developers’ guidelines in this aspect were “1. Use clear and concise language to describe mathematics concepts and process, so it is easy for students to understand; and 2. Use diagrams, pictures, and other visual representations, whenever possible, to make the textbooks more interesting and visually appealing to students and hence enrich and enhance students learning experiences in mathematics” (New Express Mathematics Project Team, 2004).

To implement this principle, textbook developers and publishers should work together (and share the strengths and responsibilities), have experts or specialists in relevant areas, and most importantly, pay reasonable attention to the aspects as highlighted above.

The following table provides a summary of the principles and process/recommendations for developing mathematics textbooks, as presented and discussed in the article. Readers are reminded again that they are based on my own experience and mainly with a Singapore context.
Table 1. A Summary of Principles and Processes for Publishing Mathematics Textbooks

<table>
<thead>
<tr>
<th>Basic Principles</th>
<th>Processes/Recommendations</th>
</tr>
</thead>
</table>
| **Curriculum Principle**: Textbooks must be developed for the implementation and realization of intended curriculum. | 1. Textbook developers have good knowledge of the curriculum.  
2. Textbook developers closely work together and have interaction with curriculum developers.  
3. Textbooks be reviewed by reviewers including curriculum developers. |
| **Discipline Principle**: Textbooks must provide solid foundation for the students to understand, apply, and study mathematics | 1. Textbook developers have a sound knowledge base in mathematics.  
2. Development team include mathematicians.  
3. Textbook developers collect ongoing feedback from the users.  
4. Textbooks be reviewed by reviewers including mathematicians and school teachers. |
| **Pedagogy Principle**: Textbooks must be developed to facilitate the teaching, learning, and assessment in mathematics. | 1. Textbook developers have good knowledge in pedagogy.  
2. Developer team include mathematics educators and school teachers.  
3. Textbook developers collect ongoing feedback from the users.  
4. Textbooks be reviewed by reviewers including pedagogical experts and school teachers. |
| **Technology Principle**: Textbooks must integrate technology to support and facilitate the teaching and learning of mathematics. | 1. Textbook developer be familiar with the development of technology.  
2. Developer team include experts in the use of ICT in mathematics teaching and learning.  
3. Textbook developers collect feedback from the users. |
| **Context Principle**: Textbooks must provide adequate cultural, social and even historical contexts when introducing mathematics concepts and contents. | 1. Textbook developers have good knowledge of local contexts.  
2. Development team include local mathematics experts and school teachers. |
| **Presentation Principle**: Textbooks must suit the level and needs of teaching and learning. | 1. Textbook developers and publishers work together.  
2. Development team include experts in relevant areas. |
References


Fan, L., Cheng, W., K., Dong, F. M., Leong, Y. H., Lim-Teo, S. K., Ng, W. L., Quek, K. S.,


Fan, L., Cheng, W., K., Dong, F. M., Leong, Y. H., Lim-Teo, S. K., Ng, W. L., Quek, K. S.,


Indicators of quality textbook

According to Hussain & Mahmood (2002), intensive utilization of textbooks results in impressive expectations from the materials utilized in them especially with respect to: a) “comprehension in term of content and pedagogy; gradually ascending vocabulary; ambiguity free sentence structures” (p.36); b) “relevant, attractive and self-explanatory illustrations; nature and pleasant design, horizontal and vertical coordination” (p.37), etc. These seem key features of quality textbook. There is also a general perception that most of the textbooks are usually selected on the basis of their easily accessible surface features (Donovan & Smolkin, 2001; Peacock & Gates, 2000; Shymansky, et al 1991). Apart from the surface features, Project 2061’s evaluation organized the instructional characteristics of effective materials (textbooks) into broad categories that include;

Taking account of student ideas

Textbooks should help teachers in attending the ideas that students already have and to help students gain a better understanding of key concepts and skills. This will help in concept building. Concepts are key building blocks for the structure of knowledge of various academic disciplines. All concepts possess at least four components i.e. attributes, examples, definitions and hierarchical relation (Tennyson & Park, 1980).

Engaging students with relevant contexts, experiences, and phenomena

Textbook should use a variety of contexts-from visual models to symbolic representations of hands-on activities and first-hand experiences-to build formal ideas and skills.

Promoting student thinking about phenomena, experiences, and knowledge

Textbooks should help students make sense of their experiences and ideas. Textbooks that provide carefully chosen and sequenced questions and tasks can help students reflect on, clarify, and explain their reasoning and ideas.

Developing and using scientific and mathematical ideas

Textbooks should provide a wide range of problem-solving and practice tasks to help students see the link between concepts and skills.

The review of the above-mentioned three cases and literature suggested eight basic indicators for a quality textbook and these include: a) conformance of the textbooks with curriculum policy, b) text reliability and validity, c) appropriate vocabulary, illustrations and format, d) alignment of the text within
the book and across the series of the subject, e) text encourages critical and creative learning, f) assessment and evaluation, g) teacher guide and other learning material, and h) bias free text. Later on, during meetings with experts four more indicators were identified and these are; i) encourage use of technology, j) acceptability, and k) environment.
Stage 1

The Textbook Approval Board (TAB) will receive and review all bids to ensure that they qualify for the competition.

The TAB will first instruct the Technical Specifications Panel to evaluate the technical specifications of the dummy submitted for each bid.

The TAB will then instruct the relevant Subject Specialist Panel reporting to it to evaluate the students’ book title of each qualifying bid in terms of pedagogic quality, presentation and illustration, using the Factors 1-7 below. The quality of the accompanying Teacher’s Guide will be evaluated using Factor 8.

Each of the factors will be allocated a number of points from 1 to 5, thus:

1 = unacceptable
2 = poor
3 = acceptable
4 = good
5 = excellent

As certain factors are given greater weight than others the score for these factors will be doubled as indicated below:

<table>
<thead>
<tr>
<th>Factors</th>
<th>Maximum number of points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Conformity to the Curriculum:</td>
<td></td>
</tr>
<tr>
<td>• Does the material conform to the requirements of the current curriculum?</td>
<td>5</td>
</tr>
<tr>
<td>2 Content:</td>
<td></td>
</tr>
<tr>
<td>• Is the factual content of the manuscript accurate and appropriate?</td>
<td>5</td>
</tr>
<tr>
<td>3 Level of Language:</td>
<td></td>
</tr>
<tr>
<td>• Is the level of language used in the text accessible to the pupils of the Grade for which the text is intended, and</td>
<td></td>
</tr>
<tr>
<td>• does it also help to improve pupils’ understanding and use of language?</td>
<td>5</td>
</tr>
</tbody>
</table>
### Pedagogical Method:
- Is the pedagogical method appropriate to classroom circumstances and pupil needs, and
- are the exercises, tasks, and evaluation and testing materials based on the text equally useful?

### Presentation and design:
How high is the quality of the following in relation to:
- the pedagogic needs of the text and the motivation of the pupils
- Page layout
- Size and style of type used
- General 'readability'
- Spacing, margins, signposting, clarity of impression?

### Illustrations:
- How high is the quality of the illustrations, and how relevant are the illustrations to the content and pedagogical intent of the text?
- Standard of illustrations
- Accuracy of illustrations
- Style of illustrations
- Relationship between text and illustrations

### Sensitivity:
- To what extent does the book portray persons and events positively and objectively?
- Are national groups and minorities represented in a way that is fair to them and their beliefs?
- Are males and females portrayed as equals?
- Are equal opportunities present in employment and family situations?

### Teacher Support (Teacher’s Guide):
- To what extent does the accompanying Teacher’s Guide:
  - relate the textbook to the aims of the syllabus
  - provide guidance on the teaching methodology
  - give background information and sources of information
  - supply extra student activities and ideas for projects

### TOTAL POINTS

---

**NOTE:**

The technical quality of the items in the bid (represented by the dummies) will be evaluated by The Technical Specifications Panel. All dummies will need to achieve the minimum technical specifications (see Section G) to qualify for Stage 1 of the Evaluation.

In order to successfully pass Stage 1, each student's book title in a bid must receive a minimum of 64% of the total number of points (or 32 out of 50). This is the **Quality Score** for the bid.
In the case of a bid which contains more than one title, the scores for each title are totalled and divided by the number of titles in the bid to arrive at the **Quality Score**.

**Stage 2**

With regard to price, each bid which has successfully passed Stage 1 will be evaluated on the basis of the price of the Pupils' Book title in each bid Lot as indicated in the Price Schedule.

The title with the lowest price receives 10 points (100%) which is the **Price Score** for that bid. Each other bid is awarded points to arrive at a **Price Score** on the basis of the formula below:

\[
\text{Price Score } E = \frac{TBP \_ L}{TBP \_ E} \times 10
\]

Price Score \( E \) = the number of points awarded for Price to the bid under evaluation  
\( TBP \) = Total bid price  
\( TBP \_ L \) = the bid price of the lowest evaluated bidder  
\( TBP \_ E \) = the bid price of the bid under consideration

**Stage 3**

The **Quality Score** from Stage 1 is now added to the **Price Score** from Stage 2 to arrive at a **Total Score** for each bid.

**Stage 4**

The **one** bid achieving the highest **Total Score** will be considered as suitable for Contract, and the books of which it is the subject will be recommended on the official textbook list.
Criteria for evaluation of technical quality of textbooks in Romania

There are eight factors on which technical quality will be judged:
1. Curriculum Coverage
2. Quality of Content
3. Language Level
4. Pedagogical Approach
5. Quality of Presentation and Design
6. Illustrations
7. Originality
8. Quality of Printing Materials

Each factor is allocated points ranking 5, 10 or 15 Points. The maximum points that may be awarded to a textbook title for technical quality is 65 points. In order to qualify for the next evaluation stage (Stage 2), the textbook must receive: (i) a minimum of 40% of the total points under each of the 8 criteria/factors; and (ii) an aggregate of 45 points (69% overall) for technical quality.

Proposals that fail to meet these minimum thresholds will be eliminated for non-responsiveness. The points for quality will be awarded in the following manner:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Factors with 5 points</th>
<th>Factors with 10 points</th>
<th>Factors with 15 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unacceptable =</td>
<td>1</td>
<td>1, 2</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Poor =</td>
<td>2</td>
<td>3, 4</td>
<td>4, 5, 6</td>
</tr>
<tr>
<td>Acceptable =</td>
<td>3</td>
<td>5, 6</td>
<td>7, 8, 9</td>
</tr>
<tr>
<td>Good =</td>
<td>4</td>
<td>7, 8</td>
<td>10, 11, 12</td>
</tr>
<tr>
<td>Excellent =</td>
<td>5</td>
<td>9, 10</td>
<td>13, 14, 15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factors for Technical Quality</th>
<th>Maximum No. of Points For Grades VI - VIII</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Curriculum Coverage</strong></td>
<td></td>
</tr>
<tr>
<td>• Does the manuscript sample meet the appropriate themes?</td>
<td>5</td>
</tr>
<tr>
<td>• Does the synopsis cover the curriculum?</td>
<td></td>
</tr>
<tr>
<td><strong>2. Value of the content</strong></td>
<td>15</td>
</tr>
<tr>
<td>• Correctness and clarity of information</td>
<td></td>
</tr>
<tr>
<td>• Quality of examples, maps, grids, readings etc</td>
<td></td>
</tr>
<tr>
<td>• Quality of the practical activities (exercises, questions, etc)</td>
<td></td>
</tr>
<tr>
<td>• General and specific educational quality of the content</td>
<td></td>
</tr>
<tr>
<td><strong>3. Language Level</strong></td>
<td>5</td>
</tr>
<tr>
<td>• The language is correct, level is adequate to the subject and accessible to the pupils</td>
<td></td>
</tr>
<tr>
<td>• The model of language contributes to developing the vocabulary of the pupils</td>
<td></td>
</tr>
<tr>
<td>• The length of the sentences and of the paragraphs and the frequency of the new terms is appropriate</td>
<td></td>
</tr>
<tr>
<td>• The assimilation of new terms is ensured by the frequency with which they are practiced</td>
<td></td>
</tr>
<tr>
<td><strong>4. Pedagogical approach</strong></td>
<td>15</td>
</tr>
<tr>
<td>• Organisation and gradation of the scientific content</td>
<td></td>
</tr>
<tr>
<td>• The way the scientific approach is backed up by examples and practical activities</td>
<td></td>
</tr>
<tr>
<td>• The contribution of the text and of the applications to form and develop certain skills and to stimulate pupils’ creativity</td>
<td></td>
</tr>
<tr>
<td>• The possibilities of graded approach</td>
<td></td>
</tr>
<tr>
<td>• The pedagogical quality of the ways of assessment and/or of the ways of revision</td>
<td></td>
</tr>
<tr>
<td><strong>5. Quality of presentation and design</strong></td>
<td>5</td>
</tr>
</tbody>
</table>
### 6. Illustrations

- The variety and the technical quality of the drawings/pictures
- The illustrations are functional and adequate to the objectives
- The artistic quality of the illustrations and colour harmony
- The balance text/illustrations; how the illustrations fit in the text

### 7. Originality

- The content of the subject is expressed in an original way; (selection of texts, of the language, of the examples, of the experiments etc.)
- The way the text, the illustrations, the exercises and the tests create situations of learning
- Developing cognitive interest as well as interest for the protection of the environment and of the human life
- The capitalisation of the connections between the subjects and between the components of the subject
- Originality in using illustration and design

### 8. Quality of materials

- Quality of the text paper (opacity, weight, percentage of white)
- Quality of the cover (weight finishing and binding)

### TOTAL POINTS

65
Gender issues in Polish school textbooks


Research focused on the question: does school prepare future citizens differentially depending on their gender? [...] Data collected in six Polish Schools (primary and middle) [...] show presence of stereotypes connected with gender images presented in textbooks and during lessons. The presence of those stereotypes should also be considered as a result of the decisions made about the structure and the content of the national curriculum. [...] It would be erroneous to treat textbooks as a collection of facts and opinions important at a certain time and from a certain perspective. They are carefully chosen and easily accessible sets of messages, ideas and philosophies, supplementary to curriculum. Textbooks are also guides for teachers, whose influence is not limited to the classroom but also to daily life. Textbooks are excellent objects for those who want to know the character of the hidden curriculum implemented in school. Textbooks play an important role in shaping behaviour or attitudes, but are also important for promoting stereotypes about gender roles and images of women and men.

Numerous elements of the hidden curriculum on gender streaming might be found in school textbooks. They are usually carriers of ideology, morality, values, lifestyles and attitudes. Textbook content is a transfer of many intended ethical messages, but also possible for manipulation and matching facts to the prevailing ideology. Many cultural stereotypes, including gender, are strengthened by the content of textbooks, sometimes unintentionally. A previous analysis of textbooks indicates that they show the world in gender stereotypes; no matter which cultural circle they belong to.

Textbooks, besides information and data connected directly to a given subject, distribute certain values and announcements, creating and modelling attitudes and values of students. Unavoidably, this creates a system or net of announcements that define gender behaviour. Apart from explicit descriptions and evaluations, a big part of an announcement is transferred in a veiled way. Is a certain activity socially important and appreciated? Is it connected with creativity or dependence? Does it require intelligence or manual skills? How can we value simultaneously a well-done birthday cake and a heart transplant? Is it even possible to do?

Research methodology

Six primary and middle schools were researched during three stages from March to May 2004. The first stage of the research was based on analyses of textbooks used in those schools (math, chemistry, biology, preparation for family life, civic education and integrated education for early childhood). Altogether, sixteen different textbooks were analysed. It was decided to focus on three categories of analyses: the specific traits of men and women, the main interests of men and women, and the typical roles of men and women.
Chemistry textbooks

Looking at chemistry textbooks, not only are men and women described differently, but men's features are the ones that are commonly perceived as positive ones; not an obvious effort, but still, it is easy to find clear distinctions in how men and women are presented. Men are more active, focused on the common good and the development of science, and women may learn in their shadow, they need to be reprimanded not to harm their health and the health of their children.

Chemistry textbooks use well-known models of gender differentiation to inform the readers about the character of men and women's activities - one active and one passive, one that achieves success and the other that benefits from the effects of the work of the first. Certainly, it would be absurd to require the censorship of history or the creation of unlikely stories, as believed that increasing and changing the character of women's presence in textbooks may result in. But this does not mean an agreement on the status quo - a gender-sensitive author - would be able to introduce changes that would help girls identify with chemists (language, case studies, and illustrations).

A great difference in the number of male and female characters in chemistry textbooks must be stressed. In the first textbook, there are twenty famous scientists and inventors, and none of them female. The only woman that is introduced in a text is a wife of one researcher and her serving and supporting role is underlined. A significant procedure that cannot be historically explained (as explained in a previous example) is that in the pictures illustrating chemical experiments in one of the textbooks, there is only a boy, in another a crazy male-scientist, and in a third, a required symbol within the text shows a boy wearing a school cap. To illustrate human organs sensitive towards radioactivity, a picture of a female body was used.

In all chemistry textbooks, a masculine narration is used, and for comments, the first singular person is used (look at, define) in the masculine (not translatable). In math textbooks, the masculine narrative is used most often. When the exercise is about a female character, she is called Sophie or Kate, whilst the male characters are called Mr. Nowak or Mr. Smith. Girls present in pictures are usually younger and smaller than male characters accompanying them. On pictures with numerous characters, as a rule, there are fewer girls.

Math textbooks

In math textbooks, the majority of characters are male. Men and boys are more interesting, more diverse and interested in the world, while girls are "duller", toned, and neat. There are almost no announcements ascribing values to genders, but there is something "attractive" tied to men's characters. Their attractiveness is based on their typical activity. Girls are rather passive.

Analysed math textbooks very often use 'real life' examples as illustrations for mathematical exercises describing people in action. Analysing those descriptions, we may discover visions of the world of textbooks' authors and debate about the information that children using that particular textbook will receive. Adults and children presented in textbooks take part in different activities, which in a sense may enable students to place particular individuals in social structures and create images about them.

There is a difference in the way adults and children are described - men and women differ more than boys and girls. Men, more often than women, tend to behave irresponsibly and inconsistently. These
behaviours may include gambling (one of the male characters loses his bequest in this way) or playing cards. If a character does not lose his money on cards, he is trying to win in the national lottery. Boys solve mathematical problems, and girls do not. They know how to build a PC, dream about computers, give advice and pass exams. Girls spend their time differently - eating sweets, writing poems, collecting buckeyes, saving money to buy chocolates, listening to music. Absolutely different interests are visible in these examples, additionally indicating different abilities.

**Preparation for family life textbooks**

Amongst all analysed textbooks, ‘preparation for family life’ textbooks are the ones that stress most strongly (and most often) psychological and intellectual differences between genders. The role of the parent as a kind of priestess caring for the home is reserved for a woman. Amongst professions chosen by women, we may find jobs such as a kindergarten teacher, a policewoman, and a nurse. These textbooks do however mention contemporary, but not very popular, trends of changing family roles, resulting in the woman being the breadwinner. It is treated as a surprise, something untypical, when women choose "male" professions. In this statement, there is a clear conviction that there is an emphatic division of work according to gender and that the modern phenomenon of overlapping these two work categories is not desired. Girls are to be mothers, and their main goal in life is to get married and start a family. What is interesting is that the model for boys is no different, that they should plan to be a husband and father, and nothing else.

Early childhood textbooks present the world and its residents in a traditional way, simply copying existing divisions of roles and the way of thinking about genders. But, it is worth stressing that there are attempts, not very numerous, of breaking stereotypes in some of them.

However, once again, men are the ones who perform activities commonly perceived as important ones, they are presented at work as professionals - people that are responsible "for something". They work, so they deserve leisure time; they are often showed in situations in which they either actively rest or are very tired and do nothing because of that. Such an activity and responsibility is however connected with the fact that they are making mistakes from time to time. This is often a symbol ascribed to farming - although farmers are a social minority, they are one of the main characters in textbooks. Men rarely fulfil themselves in activities that are perceived as typically feminine; men usually think that these activities are dull, and not worth performing (see e.g. a course in sewing). The only activity that men share with women, to a certain extent, is taking care of children.

Women work in spheres of little importance or strategic meaning. They are not very often described in their professional world, but when they are, they are performing jobs that have traditionally been reserved for women. Mostly, women are described as playing social roles such as mothers, wives, grandmothers, daughters. Women's activities are mostly about serving the family (like cooking), including bringing up the children according to the future gender roles they are to play in society. From the many examples that illustrate this, there exists an example in which a mother leaves her children a note asking her daughter to peel potatoes, and her son to heat an already prepared dinner from the fridge. It is characteristic that while men very rarely act in typically "female" spheres, women more and more often take men's roles. Unfortunately, it is very often followed by the author's comment depreciating the value of a woman's activity, or showing men as controllers of quality. Through the description of activities, the praise of dependence as a woman's virtue is concealed.

In textbooks on "preparation to family life", a traditional perception of men and women's roles in a society is dominant. Taking care of the home and children are women's duties, while men are
assigned the role of the breadwinner. Women’s professional work is perceived as a danger to the proper functioning of families. Boys’ and girls’ activities show a model of a family typical in a patriarchal culture. Girls play at home. At school, they take care of dolls and animals, thus they are only interested in playing the roles in which they may show their maternal features. Boys choose games connected to movement, strength, skills, they are interested in computers, and as they age, they develop their growing intellectual abilities. Girls of the same age think only about their beauty, and what to do in order for boys to like them more. When they start a family and there is a new baby at home, it seems that only the mother has new duties. Authors almost never mention the active role of a father in taking care of a baby as a toddler.

These textbooks are another reason why gender stereotypes are so well established in Polish culture. The world presented in textbooks is dichotomous, male - female; language and culture noticeably differentiate those two worlds, not only in terms of conjugation or pronouns. It is underlined that women perceive and live the world differently than men, and distinction between femininity and masculinity carries a great meaning.
1. The Evaluation System

Contents of this docket are intended to raise an awareness of bias and to provide the evaluator with guidelines to judge the quality of textbooks. It is also our intention to challenge you to judge sensitively and to think critically about the content presented to you. Each of the 6 factors will be allocated a number of points from 1 to 4, namely:

1 = Unacceptable
2 = Needs major revision
3 = Needs minor revision
4 = Recommended

The following classification may be used to arrive at the assessment.

- Does the content of the textbook include all groups of people who can reasonably be represented?
- Does the material promote only one point of view, either a personal one or that of a specific group?
- Is the viewpoint appropriate and reasonable from a pedagogical point of view?
- Is diversity recognised and substantially included?
- Are the text, illustration, exercises and level of language used suitable for the intended age group?
- Is the information presented clearly and accurately?
- Are the text and illustrations used in the textbook modern and appropriate?
- Is the text free of discriminatory or inappropriately value-laden language?

2. The Types of Bias

a. Appearance Bias

- Are people ridiculed because of their colour or shape?
- Are the successful people always depicted as elegant?

b. Belief System Bias (Religious Bias)

- Is the content critical of people’s beliefs or worship?
• Are religious icons referred to with disrespect?

c. Ethno-Cultural Bias

• Are some ethnic groups portrayed as being superior to the others?
• Are activities of one group commended, while the contribution made by another is ignored?

d. Gender Bias

• Are women depicted as subservient?
• Do illustrations or text depict men as being more talented than women?

e. Disabilities Bias

• Are people with disabilities laughed at?
• Are old people treated with contempt?

f. Social Bias

• Are children from broken homes treated as inferior?
• Are the examples chosen referring to things generally familiar to the affluent people?

3. Marking System

• The entire textbook will be evaluated to determine the existence of subtle and overt biases
• The Sinhala and Tamil textbooks will be treated as separate items and will be evaluated independently.
• The ‘The Teacher’s Guide’ will be treated as part of the textbook.
• In order to successfully pass, textbooks in either language must receive a minimum of 3 marks (which corresponds to ‘needs minor revision’).
• Whether the textbook is recommended or not, a brief comment on each criterion explaining your rationale for the score allocated will be most welcome.

4. Ways to handle learning material with identified bias

a. Consider the impact they will have on the students, both as individuals and as members of a group.

b. Help students think critically about the material presented to them. The book should:

• Identify and explain terminology and its use.
• Explore beyond surface meanings and without accepting things at face value.
• Look for gaps in perspectives, voices, and experiences that are not represented.
• Explore the past and present from more than one viewpoint.
• Provide a safe environment in which students feel comfortable.
• Encourage students to question the values and opinions expressed in the textbook.
• Point out the bias and put it into the context in which the information is used.
• Provide relevant background information and other points of view.
• Encourage discussion about the bias and related concerns.
UNESCO-IBE
Training Tools for Curriculum Development

- Make students aware that they should respect the response of those victimised by the bias.
- Help students recognise the opportunities that exist for positive change.

5. Bias Detection Criteria for Textbooks

a. Appearance Bias

1 Unacceptable
- People are referred to by the colour of their skin.
- People with impairments are ridiculed.
- Smoking and drinking are depicted as macho behaviour.
- Inappropriate attire is utilised to depict persons.

2 Needs Major revision
- 50% of Unacceptable

3 Needs Minor revision
- 50% of Recommended

4 Recommended
- The text and the illustrations refer with respect, to people from diverse backgrounds, colours and shapes.
- The pedagogical methods used help students develop decision-making abilities, social participation skills, and a sense of political efficacy needed for effective citizenship.
- Individual and group activities are designed to foster positive interactions among staff, students and students’ families.
- The content is developed to help students respect good qualities of individuals and groups as opposed to their physical appearance.

b. Belief System Bias (Religious Bias)

1 Unacceptable
- Distorted text is utilised to depict some beliefs as primitive.
- Dogmatic treatment of subjects associated with faith.
- Insensitivity in discussing religious viewpoints.
- Badly chosen illustrations for text/age range.

2 Needs Major revision
- 50% of Unacceptable

3 Needs Minor revision
- 50% of Recommended

4 Recommended
- The text and illustrations contain images of people from diverse cultures and religions.
- All religious teachings are discussed with respect and understanding.
The textbook provides opportunities for all students and staff to participate in anti-bias education programs that promote awareness of personal biases and provide opportunities to develop skills to challenge bias.

Illustrations reflect social situations appropriately and avoid stereotyping

c. Ethno-Cultural Bias

1 Unacceptable
- A group of people are described as being superior to others.
- Stereotyping of some ethnic groups.
- Historical events are distorted to disgrace ethnic groups.
- Controversial Ethno-Cultural topics are discussed in a prejudicial manner.

2 Needs Major revision
- 50% of Unacceptable

3 Needs Minor revision
- 50% of Recommended

4 Recommended
- The textbook includes imagery of diverse people engaged in everyday dress and activities, as opposed to ancient or ceremonial dress (for example, a Vedda in Western dress working at a computer, rather than in ceremonial Amude with an axe).
- The textbook fosters students’ learning of other languages, including sign language, a legitimate means of communication.
- Students will find themselves, their families, and/or their race or ethno-cultural groups represented in the learning materials.
- The content promotes understanding of diverse perspectives, including the values, attitudes and behaviours that support cultural pluralism.

d. Gender Bias

1 Unacceptable
- Text involves rude terminology that is disrespectful of women and children.
- Male domination is justified.
- Text and illustrations show only men engaged in vital jobs (The doctor is always a male while the nurse is a woman).
- Boys are portrayed as superior to girls.

2 Needs Major revision
- 50% of Unacceptable

3 Needs Minor revision
- 50% of Recommended

4 Recommended
- The content presents the contribution made by both sexes in achieving certain objectives (Fathers involved in caring for the children and helping in household activities).
The content includes images that counter gender stereotypes (for example, women demonstrating physical strength and men performing domestic tasks or caring for children).

The content recognises the contribution widows make in their struggle to bring up a family against social discrimination.

Content recognises the contribution of women in social development.

e. Disabilities Bias

1 Unacceptable

- People with deformities and disabilities are depicted as amusing.
- War victims are portrayed as a liability to society.
- Old people are portrayed as weak and absent minded.
- The material does not present a variety of positive role models.

2 Needs Major revision

- 50% of Unacceptable

3 Needs Minor revision

- 50% of Recommended

4 Recommended

- The content of the textbook includes images of people with a range of different abilities and body types engaged in a variety of activities.
- The teaching strategies reflect a variety of learning styles.
- The content of the textbook provides equal opportunities and maintains high expectations for all students.
- The textbook contains descriptions of people from diverse backgrounds and different age groups.

f. Social Bias

1 Unacceptable

- Poor children are depicted as being engaged in menial activities.
- Orphans are referred to as cursed children.
- Text and illustrations show children working as domestic servants.
- War is shown as patriotic while peace is portrayed as cowardice.

2 Needs Major revision

- 50% of Unacceptable

3 Needs Minor revision

- 50% of Recommended

4 Recommended

- The text and illustrations depict people from diverse backgrounds interacting with one another.
- The physical environment includes images of many different kinds of family compositions and socioeconomic groups.
The author successfully demonstrates the geographic diversity of family dwellings, neighbourhoods, and communities, such as urban, rural, and suburban.

Lessons are built up around many different kinds of family compositions and social economic groups.

WORKSHEET

<table>
<thead>
<tr>
<th>Evaluation marks for individual criteria</th>
<th>Selection panel:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Evaluator’s name:</td>
</tr>
<tr>
<td>Respect for diversity</td>
<td>Date:</td>
</tr>
<tr>
<td></td>
<td>Bid package No</td>
</tr>
<tr>
<td>Book title</td>
<td>Grade</td>
</tr>
</tbody>
</table>

1. Mark the elements of 4. Gender Bias by circling one number: e.g. 3

1) Appearance bias  1  2  3  4
2) Belief system bias (religious bias)  1  2  3  4
3) Ethno-cultural bias  1  2  3  4
4) Gender bias  1  2  3  4
5) Disabilities bias  1  2  3  4
6) Social bias  1  2  3  4

Comments:

2. Total the marks of 1+ 2 + 3 + 4 + 5 + 6 =

3. Divide the Total by 6 = (to nearest whole number) = Criteria Mark =

Evaluator’s signature:
<table>
<thead>
<tr>
<th>Evaluator’s name</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>TOTAL SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL SCORE =

OVERALL SCORE out of 4 ( = Total score divided by the number of evaluations) =

Comment:
E-Learning in Japan

Introduction: What is e-learning?

E-learning is instruction delivered electronically online, using new multimedia technologies (CD-ROM or DVD) and the internet/intranet to improve the quality of learning. E-learning can be delivered through web-based portals where teachers, students and others can find many resources online, including curriculum resources and teaching and learning materials, and where they can collaborate with others – ‘anytime, anywhere’. It covers formal and non-formal education without borders of time, people and place. The sharing of learning objects, interactive communication, the sharing of learners’ experiences and opinions, mass media, empowered multimedia that include broadband, mobile phones, televisions that work as monitors, and multimedia integration allow synchronous and asynchronous learning as a component of e-learning. It creates a new type of in-classroom learning environment, and allows to learn and link globally (students can link to world knowledge even in the classroom). In order for e-learning to be implemented, appropriate infrastructure has to be provided.

Rationales for e-learning

E-learning is considered to be a rapidly emerging strategy to help reduce the digital divide in the Asia Pacific Region. In Japan, while the digital divide between rural-urban areas or rich and poor settings may not be so acute, it is apparent between older and younger generations, and between men and women.

E-learning is seen as an instrument for facing the challenge of globalisation. The potential for learning standardised content via e-learning can help learners in economically-challenged countries. By developing globally competitive human resources, the economic growth of developing countries would be enhanced.

E-learning also provides the opportunity to bring quality learning to more people in different places at different times. E-learning has the great potential to provide access to quality education to various learners.

Flexibility is an attribute of e-learning, which helps address the learning needs and respond to the various learning styles of education clients. It is also flexible in that it could be updated easily, in terms of content, methodology and processes.

Interactivity is another attribute of e-learning, which makes it a potentially effective delivery strategy.
E-learning in Japan: the current situation

1. Existing policy

There are facilities (faculties) and institutes for policy and management for e-learning all over Japan. The National Information Centre of Education Resources (NICER) is a central website providing all kinds of information on educational resources in Japan. It also provides various kinds of support systems for learners and educators. NICER's mission is to support teachers and students in various ways and provide them with the information they want and need.

The development of NICER is the responsibility of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), jointly with the Ministry of Economy, Trade and Industry (METI), and the Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT). In this project, the three ministries joined forces to improve educational content for teachers and develop a system that effectively supplies the content. The goals of the project are to establish Information Technology (IT) environments in schools, improve teachers' competence through the use of this IT, and promote the utilisation of IT in lifelong learning. It is hoped that the information and support provided by NICER will help everybody to increase their achievement levels and the quality of their learning.

In addition, the National Institute for Multimedia Education (NIME) supported by the MEXT includes e-learning centres, especially in universities. They emphasise the importance of education such as e-learning which is leveraged through Internet technologies. NIME also plans to emphasise the research and development of information networks that enable contents such as materials and courses for higher education at universities to be shared via the Internet. We hope that such research and development will eventually realise more advanced utilisation of educational contents by universities and other higher education institutions.

2. Curriculum

The NICER web page contains over 100,000 digital clips (teaching materials, teaching contents) on curriculum integration (E-Case, IT NAVI). NICER collects all kinds of resources on Japanese education and learning from the Internet and systematically organises them. In the future, NICER will also include commercial digital teaching materials developed by private companies.

3. Teacher training workshops

NICER web pages provide “Integrate IT into your class” video clips.

4. Assessment in curriculum process

5. Learning areas - Japanese language, social science, math, science, English, etc.

6. Target - Teachers, students, parents and others.

NICER aims to develop a system that can provide educational and learning resources to preschoolers, students of lower and upper secondary schools, college students, working adults, lifelong learners, teachers, and educational personnel. The system under development enables both students and teachers to choose and display exactly what they are looking for.
7. **Partners** - Teachers, students and parents.

8. **Examples of practices**

At Gifu University, collaborative learning emphasises the use of the Internet, BBS, Web-chat, and cell-phones to access the BBS. It is comparatively easy to introduce e-learning systems into educational activities at the university level, especially with small groups such as laboratories or individuals. However, problems emerge when the introduction of the e-learning system is planned as a policy of the entire university. In the case of Gifu University, the Information and Multimedia Centre have tried to integrate existing media services as ‘AIMS-Gifu’ (Academic Instructional Media Service Gifu) starting in 2002 [http://guaims.cc.gifu-u.ac.jp/](http://guaims.cc.gifu-u.ac.jp/). On AIMS-Gifu, many media services (i.e. Video Conference System for Satellite Classrooms) are integrated under Learning Management System (LMS: Blackboard Learning System ML). Through our work, we found that introducing new e-learning systems was very difficult work. For example, recently the university created a personal affairs’ database or educational affairs’ database. These databases are designed and implemented as individual, isolated systems. If we use these systems’ data for e-learning, existing systems may be changed. Therefore, introducing an e-learning system is not only about the design and implementation process of hardware and software, but also about the process of changing the existing systems.

**Issues/challenges in e-learning**

Policy gaps (issues and problems) have been identified in the following areas:

1. **Bandwidth issues** - Learners are impatient with slow technologies. The issue needs to be addressed by the governments and other stakeholders.

2. **Regulations on e-learning** - Intellectual Property Rights (IPR) – IPR regulations need to be reviewed so that they do not interfere with or pose constraints to the use of e-learning in education. The need to facilitate e-learning on the one hand and the need to protect intellectual property on the other is a challenge that Japan faces at present.

3. **Integrating e-learning into the overall educational policy measures** - Policy measures are needed to either make e-learning an in-syllabus strategy or a complementary/enrichment strategy. At present, it is still quite difficult to promote the concept to the educators who are used to the conventional mode of teaching. Sometimes, teachers who are familiar with the technology are given more tasks. There are too many tasks for the ICT specialists because of a lack of human resources (number of ICT specialist). Moreover, there is still a strong resistance to using computers among many teachers in Japan.

**Challenges**

1. **Curriculum Integration** - Content development and materials production are important components in promoting the use of e-learning. If materials are available, teachers are encouraged to use them in the classroom. Capacity-building of school leaders and teachers is an important component in developing competencies in curriculum integration of e-learning concepts and tools.
2. Training of teachers - Advocacy to accompany this paradigm shift is recognised as an important requisite in promoting e-learning, especially among teachers and school heads:

“Teachers should realise that they are not the sole sources of knowledge”

“Learning to learn (from knower to learners) is important - Learners should be trained on how to learn the elements of e-learning”

There should be training programs/teacher courses on the use and practice of e-learning. The pre-service curriculum needs to be reviewed/revitalised/renewed in order to include e-learning concepts and tools. At present, there is a mismatch between e-learning concepts and courses offered by many teacher education institutes and those offered in various in-service training programs for teachers or those seen as most relevant for the current and future needs of schools. In addition, the school heads, managers and supervisors also need be trained or given in-depth orientation on e-learning. As a response to this issue, some projects, such as Intel Teach to the Future, undertake capacity-building projects which develop e-learning competencies of both teachers and school managers.

3. Assessment in the Curriculum Process

As far as assessment is concerned, summative evaluations need to be undertaken in a conventional manner; however, formative evaluation tasks may be integrated into the e-learning strategy.

- The quality of learning, not just what students are learning (not only factual topics but more importantly, the higher order thinking skills), should be looked into.

- Evaluation should focus on two dimensions: (1) Skills development relative to the use of the technology, and (2) learning content via the use of technology. There is a concern in Item 1 because of the different platforms (some are Macintosh while others are Microsoft platforms).

Schools/universities are generally autonomous and the evaluation activities are institution-bound. A possible strategy is to develop consortium-type arrangements and other types of partnerships so that schools may have common evaluation and assessment instruments that will allow students to take examinations recognised by participating schools/universities.

4. Utilisation in various learning areas

E-learning may be used in almost all subject areas but it will never substitute or replace the teacher. It is best used as a complementary strategy to enrich learning. The computers are often put in the classrooms as tools to improve and enrich learning.

E-learning is emerging as a strategy to deliver learning in various areas, to different educational clients.

E-learning is seen to have little value added to the existing education system.

Lessons learned
1. Collaboration between and among institutions and countries can help reduce redundancies, prevent pitfalls and eventually make e-learning more efficient. These groups can collaborate on the processes and how they do things that could serve as a basis for doing their own individual activities.

2. Benchmarking is a corollary activity. Models and best practices by some e-learning projects are good examples, which can provide insights to others in planning their own projects.

3. The need for common platforms needs to be addressed in order to enable users in different places/countries to use the e-learning materials.

4. Partners may include business, parents, the community, and other stakeholders. Partnership between the education and training sectors (schools, universities and vocational education), and partnerships between different governments help work in e-learning and the government also works with the multimedia industry to strengthen it and improve its skills.

5. Targets clients include: teachers, school managers, supervisors, school inspectors and other stakeholders.

Suggested additional readings and websites


http://www.nicer.go.jp/
http://www.nime.ac.jp/
http://www.u-gakugei.ac.jp/~crsep/
http://gauge.u-gakugei.ac.jp/apeid/apeid.html
Study on the use of ICT in school education

Context of the study

Fostering the utilisation of information technology in education is one of the missions assigned to the Office of the Deputy Director for Information and Communication Technologies in Education (SDTICE).

Under the impetus of the Ministry, through the intermediary of decentralised services at the Region and Department levels, the introduction of information and communication technology in education (ICTE) in primary and secondary schools has been completed as regards the installation of technical facilities. Local authorities have invested significantly in equipping schools and classrooms with state of the art technology.

At the same time, content has been enriched and restructured to facilitate accessibility by teachers. For example, the PRIMTICE project¹, launched in 2004, made it possible to develop a library of teaching scenarios classified by discipline and by topic as a tool for school teachers. This resource is available on Educnet's national website, as well as sites developed by decentralised services (i.e. academic regions and inspectorates). For the secondary level, the EDU "Bases"² database proposes lists of academic teaching practices which can be searched according to level of education, subject within the curriculum, type of activity and the B2i domain concerned.

It is also important to mention the efforts made with regard to the training of students and teachers in information and communication technologies. In the case of teachers, it was important to foster the realisation that their role is being progressively transformed by the use of ICTE both with regard to teaching (e.g. by facilitating interactivity) and classroom organisation.

Objectives

Within this context, the SDTICE noted the diversity of systems installed in educational institutions, which is due to the rapid evolution of the available technology proposed to local authorities. Added to this are the many different types of support provided by decentralised services: the manner in which the means dedicated to ICTE are organised (e.g. correspondents, download times, etc.) varies from one academic region to another.

² [http://www2.educnet.education.fr/secondaire/usages/edubases/](http://www2.educnet.education.fr/secondaire/usages/edubases/) [in French]
Accordingly, the objective of the study was to “take stock of the practices and perceptions with regard to the use of ICTE by teachers and students and how it is perceived by them within their institutional context. Particular attention will be paid to certain specific tools, for example, the interactive white board and the mobile classroom”.

The definition used with regard to ICTE technology was “computer equipment used in the classroom, either alone or in combination”.

**Definition of the problem and methodology**

ICTE use is a complex, multidimensional subject, involving questions related to technology, discipline and support, to mention a few. An observational approach of a “monographic” kind contains significant biases (e.g. observation time in the classroom vs. impact of ICTE over an entire year), one of which is that of basing the analysis and conclusions on a single case, no matter how relevant it may be within its context.

For this reason, the approach that was adopted focused on gathering teachers’ perceptions by means of a questionnaire, on the assumption that teachers are the players who have accumulated a sufficient wealth of relevant observations and experiences.

By grouping the perceptions thus gathered and listing them in order of importance, it is possible to identify avenues of reflection and adaptation in which all stakeholders are prepared to invest in order to take the implementation a step further towards generalised use.

The study's perimeter involved four volunteer academic regions: Clermont-Ferrand, Créteil, Nantes and Nice. Each region selected 10 elementary schools and five secondary schools.

**Outcomes**

1. Sample
   We received 204 questionnaires; we entered and analysed 202 of them. There were 157 ICTE users and 45 non-users.

   This sample included:
   - 105 respondents at the primary level and 92 respondents at the secondary level;
   - 120 women and 77 men;
   - 28 persons having an ICTE function;
   - 19 math teachers, 14 teachers of technology and of living languages, 12 in humanities, 9 in physical education, history and geography, and 7 in life and earth sciences.

   We were able to observe in particular that the respondents reported being especially well-provided for in terms of equipment. This is due to the fact that the study was carried out in educational establishments already equipped in ICTE technology. Because of this, coupled with the sample size, it is not possible to consider this analysis to be scientific in nature.

   Indeed, it is important to bear in mind that the sample is not intended to be representative. This study is simply a collection of opinions on which other larger studies could be based. It reveals certain
trends which would be of interest for identifying courses of action, but in no way does it yield figures which are representative at the national level.

2. Analysis of the overall outcomes – teacher-users
For the majority of teachers, the exercise was primarily the logical extension of their own personal utilisation of ICTE. It constituted also a response to the generalised utilisation of ICT in society.

Over half of them think that it is an institutional requirement. The reasons that led to its utilisation, in order of importance, were:

- a project in which ICTE was used;
- a vocational training course;
- a colleague;
- extension of an initial training course.

The first observation is that the responses show that the experience of users with ICTE is globally positive, both with regard to the advantages that it affords and its limited number of disadvantages.

- **The impact of ICTE on student participation**

Respondents have a very positive impression with regard to ICTE’s capacity to create a motivating environment, facilitate assistance, and increase student autonomy.

The responses were also extremely favourable with regard to two aspects in particular: it facilitates concentration and enhances participation. Then come a number of characteristics which indicate a “value added” effect of ICTE: it makes learning more meaningful, it contributes to the social development of students, it facilitates the acquisition of working techniques and allows greater freedom in the organisation of each student’s work. It should be noted that with regard to these aspects some respondents had no opinion.

Only a minority felt that ICTE led to greater fatigue on the part of students and that it failed to develop a sense of effort, because it was too recreational. Teacher-users saw this as only a minor disadvantage, which confirmed their commitment in favour of ICTE (and/or a certain lack of objectivity with regard to its utilisation).

- **The impact of ICTE on classroom organisation**

The vast majority of respondents agree on two positive effects of ICTE: it facilitates a differentiated form of organisation, thus facilitating the organisation of activities simultaneously, and, to a lesser extent, it makes it possible to have students carry out a greater number of activities.

For slightly over half of the respondents, the constraints with regard to the utilisation of ICTE were significant:

- More detailed instructions are required.
- Several hours of training are required before students become autonomous.
- Sequences have to be decomposed into smaller parts.
- A supplementary element of complexity is added.
- Mastery of a module by students is made more difficult.
In extreme cases, it was felt that mastering the tools pre-empted the learning of subject matter and removed a certain amount of flexibility in the flow of a lesson. These two responses probably correspond to a fringe group of teachers who experience difficulty in mastering these tools.

**Educational objectives**

First, the goal is to make students aware of new technologies, to carry out a specific learning project, and to allow for a greater amount of initiative on the part of students in the learning process.

With regard to aspects with greater educational value-added—assisting students in difficulty, introducing a new concept and individualising a sequence according to each student’s level—the responses are markedly less positive.

The same applies to assessment: testing knowledge and identifying students in difficulty. There is, therefore, under-utilisation of ICTE, including among users. This confirms reactions recorded during the pilot phase of the questionnaire: it was at that time that certain teachers became aware of the great potential of these tools.

**Impact on knowledge acquisition**

Responses to this question are far less clear-cut, frequently consisting in “rather”, and the number of “no opinion” was relatively high. This is no doubt indicative of the fact that respondents do not have a clear view of the utilisation of ICTE for knowledge acquisition.

A large majority of them consider that it facilitates the carrying out of certain assignments by students, as well as broad access to information, and that it makes it possible to deal with errors rapidly.

A smaller proportion of respondents feel that the tools facilitate remediation and memorisation, introduce a greater degree of reality into the classroom, and make it easier to repeat an earlier sequence and to decompose sequences of logical reasoning and actions.

Nonetheless, the results reveal both a great lack of understanding of the possibilities offered by ICTE and probable under-utilisation of it.

With regard to knowledge assessment, the findings indicate there is resistance. Indeed, the number of positive and negative responses is equivalent.

The majority of respondent do not experience difficulties in using ICTE. It should be noted, however, that some of them feel it widens disparities between students and assume that it creates dependence on technology.

Within the framework of a plan to disseminate these approaches, it will be necessary to ascertain on which experiences and on which notions these responses are based. This could be carried out within working groups given the task of analysing these findings in the light of professional practices.

Only a minority think that ICTE creates a greater distance from reality.
Activities carried out using ICTE

This question confirms the first elements of the analysis. Use is made “episodically” to carry out a project or look for an illustration; uses with educational “value-added” are less frequent.

Indeed, ICTE is used by respondents essentially to carry out a specific learning project, to facilitate the illustration of a comment, or to obtain information. Less than half the respondents use it for individual or group exercises.

Even fewer respondents rely on ICTE to analyse an experiment, test knowledge, give instructions, provide remedial assistance, perform simulations or carry out computer-assisted tutorials.

Remedial work is of particular interest, for we find that the majority of respondents regard ICTE as a remedial tool, but less than one third use it for this purpose.

This gap between positive perception and actual utilisation indicates a need to identify and broadly disseminate the elements concerning this specific topic which would “reassure” teachers with regard to the implementation of this application.

Value of ICTE from a personal point of view

Responses to this question are positive overall and clear-cut, indicating that the generalised introduction of ICTE needs to be accompanied by communication focused on these topics. ICTE ensures better mastery of computer technology, the possibility of creating new and more creative sequences, and breathes new life into the profession and professional practices.

It also facilitates group work: interdisciplinary activities, expanded collaboration among colleagues and overture towards other schools and establishments. Fewer respondents feel ICTE enhances the status of teachers. ICTE use is demanding, requiring prior mastery of the tools and a great deal of preparatory work.

Several factors that hamper generalisation of ICTE use

The main reason cited by respondents is the lack of time. This is followed by the idea that ICTE use will radically change teaching practices and its “demanding” aspect.

Some feel these tools are ill-adapted to their teaching and fear being less performant if they use them.

A minority of respondents are not sure of the educative value of ICTE and are opposed to its utilisation.

This question revealed various levels of resistance and indicated the number of respondents at each level: fears for the profession, lack of understanding of the educative potential, rejection of the tools.

Support measures

A large majority is satisfied with the facilities put in place, including the availability and choice of equipment. It should be recalled that this non-representative sample consisted of establishments that were already equipped.
Although most respondents are satisfied with the support provided within their establishments, they are less satisfied about training both with regard to the material aspects and pedagogical training. Above all, they are unfamiliar with the scenarios presented to them and, among those who are familiar with them, the number satisfied is equivalent to the number dissatisfied.
In Indonesia, as it is indicated in the Education Law (2003, Article 35), educational resources and facilities are a part of the education standard for quality improvement. Thus, the access learning resources need to be standardised. Learning resources may include the availability and variety of non-print materials. This includes library, laboratories, school garden, sport hall, room for religion practice, health corner, audio visual, educational kits, teaching-learning aids/equipment, computers, courseware and multimedia learning resources, and the directory of resource person for local content and life skills. The involvement of resource persons is measured as a contributing factor to school-based management and school quality.

In general, textbooks have improved in terms of quantity and quality. The textbooks autonomy policy has resulted in greater access to textbook provision, localisation and diversification of content. However, the access to textbooks at school varied. In primary schools, the access to language textbooks ranked the highest (85.30%) compared to that of Mathematics textbooks (82.87%), and Science (57.43%) in the academic year 2000/2001. In Junior Secondary School, the access to Indonesian language textbooks reached 90.25%, access to mathematics textbooks was 89.35%, and access to Science, English, and Social Science was respectively 53.92%, 75.24% and 77.04% in the academic year 2000/2001. Generally, the ability to provide textbooks varies from one province to another. There are provinces which possess a collection above the national average and there are also provinces which have lower access to textbooks. Therefore, the access to non-print learning materials is significant. The various types of non-print materials can be seen in the following diagram and table.
<table>
<thead>
<tr>
<th>No</th>
<th>Non-print materials</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>People</td>
<td>People are the most accessible non-print materials. These include children themselves. In learning science, a child can learn about senses, pulse, growth, differences and similarities of human characteristics. In mathematics, children can measure their heights, hands, hair, and use their fingers for calculation. In social studies, they can learn about consumption, family, habits, and traditions. Resource persons include other children, parents, experts, local leaders, technical person, traders, etc</td>
</tr>
<tr>
<td>2</td>
<td>Events</td>
<td>Events include parties, cultural ceremonies (birth, married), official ceremonies (raising flag, independence day), election, etc.</td>
</tr>
<tr>
<td>3</td>
<td>Natural Phenomena</td>
<td>Natural phenomena include weather, rain, clouds, sunrise, sunset, flood, earthquake, typhoon, etc.</td>
</tr>
<tr>
<td>4</td>
<td>Procedures</td>
<td>Procedure includes school regulation, timetable, administrative procedure for homework submission, record card, library system, laboratory system, safety rule, traffic system, student meeting, game rules, etc</td>
</tr>
<tr>
<td>5</td>
<td>Artefacts and man-made materials</td>
<td>Artefact include human made materials, art products, paintings, maps, sport or art merchandises, mascots, statues, food products, fabrics, etc.</td>
</tr>
<tr>
<td>6</td>
<td>Collections</td>
<td>Collections include for example collection of stamps, currencies, coins, phone cards, post cards, stones, beads, etc.</td>
</tr>
<tr>
<td>7</td>
<td>Tools</td>
<td>Kitchen utensils, automotive tool kits, gardening tools, etc.</td>
</tr>
<tr>
<td>8</td>
<td>Nature</td>
<td>Mountains, lakes, seas, rivers, soils, minerals, stones, air, water, land, natural environment, plants, and animals.</td>
</tr>
<tr>
<td>9</td>
<td>Information and Communication Technology</td>
<td>This includes hardware and software, internet, audio and visual aids. ICT materials are an application tool when used to assist the learner in learning task, and a tool to facilitate communication when used to send, receive and share various forms of information among students.</td>
</tr>
<tr>
<td>10</td>
<td>Places</td>
<td>This includes laboratories, libraries, school yards, sport halls, museums, bank, offices, post offices, markets, etc.</td>
</tr>
</tbody>
</table>

Communities can support the availability of non-print learning materials that are relevant to their own needs and potential; for example, rural communities can provide resource persons in agriculture or aquaculture, salt production, crops, traditional market, etc., and urban communities can provide expertise in many fields such as business and commerce, information and technology, etc. Enterprises may support to provide computers, food products and other tools. The pictures below are example of non-print materials that can be used in learning activities.
1. Salt production is a useful learning material in coastal communities

2. Dried fish can be used as learning materials for productive field trips
3. A traditional market is a good project to explore

4. A religious ceremony also offers a wealth of resources for learning
5. A resource person tells a story in a school yard using learning resources.