

e-Textbook Writing Guidelines for the Technology Education Key Learning Area Curriculum (Secondary 1-3) – Design and Technology (Knowledge Context)

1. Introduction

The purpose of this set of guidelines is to familiarise interested e-textbook publishers with the curriculum aims and objectives, guiding principles for writing e-textbooks, etc. of the Technology Education Key Learning Area (TEKLA) curriculum (S1-3) - Design and Technology (Knowledge Context) in a bid to ensure that the e-textbooks are written in accordance with the specific requirements of the curriculum and “The Seven Learning Goals for Secondary Education” (www.edb.gov.hk/en/curriculum-development/7-learning-goals/about-7-learning-goals/secondary.html) (For details, please refer to *Secondary Education Curriculum Guide* (2017)). For the general principles and requirements for writing textbooks, publishers should refer to the latest edition of the *Guiding Principles for Quality Textbooks* available from the Education Bureau’s Textbook Information website (www.edb.gov.hk/textbook).

2. Curriculum Aims and Objectives

The broad aims of the TEKLA curriculum - Design and Technology (Knowledge Context) are to enable students to:

- 2.1 be aware of the modern technology and its impact on society;
- 2.2 understand the relationship between technology and other disciplines;
- 2.3 design with consideration of related design factors;
- 2.4 explore the characteristics of different kinds of materials and their influences to the environment;
- 2.5 solve problems logically and creatively, through hands-on and exploratory design and make activities;
- 2.6 master basic skills in the safe use of materials, tools and machines; and
- 2.7 retrieve, process, present and communicate information and ideas using information technology tools whenever appropriate.

3. Guiding Principles

3.1 Content

- *The Technology Education Key Learning Area (TEKLA) Curriculum Guide* was published in 2002 and has been implemented in schools since then. It has been reviewed and the learning elements at junior secondary level were enriched in 2017 for schools' reference. For details, please refer

to Education Bureau website at <http://www.edb.gov.hk/tc/curriculum-development/kla/technology-edu/curriculum-doc/index.html>.

- There is no change on the TEKLA curriculum framework, which comprises six knowledge contexts, namely Information and Communication Technology, Materials & Structures, Operations & Manufacturing, Strategies & Management, Systems & Control, and Technology & Living. Only the learning elements under the six knowledge contexts have been reviewed and elaborated, to explain the breadth and depth of the TE knowledge context. It aims to facilitate schools in providing a broad and balanced curriculum to help students lay a solid TE foundation on completion of junior secondary education.
- Modular approach is proposed in the TEKLA curriculum through 16 core learning element modules and 10 extension learning element modules. Schools should plan for their school-based TE curriculum by selecting a combination of modules according to schools' own strength including teaching staff, equipment available in schools, and the curriculum time allocation.
- For learning element modules and examples of implementation related to the TEKLA curriculum - Design and Technology (Knowledge Context), please refer to the "Supplementary Notes" of the TEKLA curriculum which has been uploaded on the TEKLA website.
- Materials for the e-textbooks should be so scheduled to adequately cover the content and attain the aims and objectives stated in the TEKLA curriculum - Design and Technology (Knowledge Context). Information/data included should be accurate, systematic and relevant.
- In order to arouse students' interest in learning Design and Technology and to facilitate effective learning, materials in the e-textbooks should, as far as possible, be linked to real life situation, technological applications, social issues, and students' daily experiences so as to help students in realizing the importance and relevance of the concepts being discussed. Furthermore, local examples should be cited wherever appropriate.
- Learning materials should be arranged in an appropriate sequence, e.g. from easy to difficult, from concrete to abstract. It must also be emphasized that the sequencing of topics in the curriculum is for reference only and should not be taken as the only way in organising the topics.

3.2 Learning and Teaching

- The TEKLA curriculum - Design and Technology (Knowledge Context) emphasises on learning through real-life situation. Authentic learning activities should be included to facilitate the study of technological

applications and to develop students' generic skills such as problem solving skills, effective communication skills, creativity.

- Activity-based and project-based approach should be included in the teaching of Design and Technology.
- A number of case studies should be included in the e-textbooks, which covered the contents of the modules. The authentic cases should relate to students' daily experience, and they can learn through investigation, analysis, and applied these technologies. The case studies should include relevant background information, together with a variety of learning activities and projects, so that their learning experience can be enhanced.
- A variety of activities such as design projects, hands-on practical work, case studies, discussion, role-play, debate, investigation, survey, library search, Internet search, etc., should be included as appropriate.
- Learning activities and exercises should be so designed to develop various types of student competence at appropriate levels, including their higher order thinking skills, such as application, analysis, synthesis and evaluation, critical thinking and creative thinking, problem solving, sensitivity to the environment, etc. Student-centred and interactive approaches are highly recommended, as they are useful in providing suitable learning experiences for stimulating and developing higher order thinking. The skills to be developed in a particular-activity should preferably be identified for teachers' reference.
- Activities and exercises must be categorised as basic, extension and enrichment to allow teachers using flexibly to cater learners' diversity.
- Exercises should be so designed to help students learn how to locate and process important information in the text. They should help students focus on important learning objectives and check their own progress. Stimulus materials, such as newspaper cuttings, extracts from articles, flow-charts, photos, videos, diagrams, statistical tables or graphs, Internet web sites, etc., should be provided so that students can have some concrete materials to base on, some food for thought and incentive for attempting the exercise.
- Bias and discrimination should be avoided in the selection of contents, examples, illustrations, activities, etc. Furthermore, information should be provided to help students in understanding an issue from different perspectives.

3.3 Structure and Organisation

- Concept clarity is an important aspect affecting students' learning. New concepts should be introduced at an appropriate pace and when needed during the development of the text. Effort should be made to help students connect new concepts with the concepts already learned.

- Structure of text should be readily apparent to students as evidenced by chapter titles, headings, outlines, introductions and conclusions.
- The text should be coherent at a local level. For instance, pronouns should have a clear referent and the relationship between ideas should be explicit and obvious.
- Illustration should be appropriate and effective, of proper size, suitably labelled and explained. Graphics and colours should be clear, accurate and attractive. Illustrations should be numbered for ease of reference. Scales should be included wherever appropriate.

3.4 Language

- Publishers should refer to the [Design and Technology glossary](#) provided by the Education Bureau (EDB) in developing e-textbooks. The latest version can be downloaded from the EDB website.
- The interspersing of languages (e.g. English followed by its Chinese translation or vice versa) in the text is undesirable.
- Pinyin should be adopted for Chinese names and places.
- The language used should be clear, fluent, accurate and easy to understand.

3.5 Pedagogical Use of e-Features

- Appropriate multimedia - video, audio and/or animation, should be included in layout according to the aforesaid requirements, and with captions / labels / synopsis where available.
- Glossary in multimedia format on essential technological terms for the learning of material properties, structures, electronic components, mechanical device/part, tools machines, work procedures, etc. to illustrate the concept and information.

3.6 Technical and Functional Requirements

- Refer to the latest edition of the *Guiding Principles for Quality Textbooks* for the relevant requirements.

4. Others

- 4.1 When writing e-textbooks, publishers have to ensure that the contents and information provided in the materials should be correct, complete, up-to-date, objective and impartial. The source and the date of the information should be provided as appropriate. The information in the illustrations and images should avoid showing brand-names of commercial items unless it is necessary.

- 4.2 Publishers should avoid putting excessive hyperlinks in the e-textbooks so as not to violate the self-containment principles. The contents of the hyperlinks should be placed in the teacher's handbooks or the publisher's online learning platforms as far as possible for teachers and students' reference. The hyperlinks should link to the websites with high credibility, such as the official websites and the websites of academic institutions, and avoid linking to commercial or social media platforms.
- 4.3 It is incumbent on the publishers to ensure that all proof-reading work, including the electronic functions, language, information, punctuation, illustration, pagination, etc., is completed and accurate before submitting the e-textbooks for review.
- 4.4 Publishers should clear all copyright issues of the e-textbooks as appropriate.
- 4.5 Publishers should pay attention to the curriculum time allocation suggested in the curriculum documents of this subject to ensure that the learning contents are designed with an appropriate quantity and level.
- 4.6 If publishers submit other versions (such as Chinese version or printed version) of the same textbook title for review at the same time, they should duly check the consistency of the contents among all the versions. If another version will be submitted at a later stage, the suggestions in the review reports for the previous submitted version should be thoroughly followed before submission.

Technology Education Section
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Education Bureau
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