Course
# CMP-5084-1
## Supplementary Computer Training

## Computer Science

**INTRODUCTION**

The goal of the *Supplementary Computer Training* course is to provide adult learners with the means to use their insight, acquire new knowledge and develop computer competencies beyond the level required in the other courses in the program. Two learning situations are possible.

**Situation 1**

An adult learner may have completed one of the courses in the program (or possess equivalent knowledge) and want to further his or her knowledge in a particular area. This can involve additional training in word processing, electronic spreadsheets, databases or 3D modeling, provided the subject-specific content is in no way covered in the other courses. The subject-specific content must complement at least one course in the Computer Science program in diversified basic education. Note that the *Supplementary Computer Training* course must neither replace nor duplicate the material covered in the other courses in the program.

**Situation 2**

An adult learner may be interested in a particular area or application which is not considered emerging and is not covered by the other courses of the program. For example, an adult learner may wish to develop music competencies and want to learn about digital audio editors or music sequencers. Such a case could be dealt with in the *Supplementary Computer Training* course, provided the adult uses and integrates subject-specific content other than that covered in the other Computer Science courses in diversified basic education or in common core basic education.

By the end of this course, adult learners will have acquired greater knowledge of a given application and a better understanding of how the tools of the application work. They will be able to plan, carry out and evaluate the production of a computer document.

**SUBJECT-SPECIFIC COMPETENCIES**

This course targets the following subject-specific competencies:

- *Interacts in a computer environment*
- *Produces computerized documents*

Thus, it is by activating and integrating these two subject-specific competencies and by using other resources that adults are able to effectively structure their learning.

During the learning situations, adult learners use software resources. They carefully plan their work and adapt their plan as they work. As they carry out a project and upon its completion, they evaluate their efficiency and make any necessary adjustments to their approach.

## PROCESSES AND STRATEGIES

As they learn about computers, adult learners are called upon to use various processes and strategies. These processes and strategies represent the way in which adults go about solving problems, meeting challenges and, in general, carrying out their learning activities.

For the *Supplementary Computer Training* course, the suggested approach is the production process.

| Production process |
| --- |
| • This process consists of two steps: planning and production. Four values are associated with it: communicate clearly; validate the production on a regular basis; maintain ongoing feedback and collaboration; accept the change.<br>• During the planning stage, adult learners must define the work to be done as precisely as possible. Planning must be flexible and allow adjustments throughout the project.<br>• During the production stage, adult learners must complete the project according to the planning established; maintain ongoing feedback and collaboration; accept change, even at the end of the production stage, and respond to change rather than following the initial plan. |

| **Examples of strategies** | - Comparing the current situation with the desired situation<br>- Determining the steps involved in carrying out the work<br>- Drawing up a work schedule<br>- Choosing a work method<br>- Making adjustments to the plan as they work<br>- Analyzing their results |
| --- | --- |

To meet the requirements of the production process, the initial plan must be flexible enough to allow for adjustments throughout the project. Through discussions with the teacher or with their peers, adults learn to reflect on each step in their process and arrive at a result that will differ from their original plan. By applying the above process, they learn to cooperate with others and to accept changes during the course of a project.

## CROSS-CURRICULAR COMPETENCIES

The cross-curricular competencies are not developed in a vacuum; they are rooted in learning situations and contribute, to varying degrees, to the development of the subject-specific competencies, and vice versa.

Several cross-curricular competencies can be useful in dealing with the learning situations in the *Supplementary Computer Training* course. Two are considered particularly relevant to this course: *Solves problems* and *Adopts effective work methods.*

- **Intellectual Competency**

Adult learners who take this course deal with situations that are not covered in the other courses. They must analyze the elements of a situation, test different solutions and adopt a flexible work method. For example, adult learners who construct a table of values for a Canadian mortgage loan analyze the situation and break it down into steps. They find the appropriate calculation method, reproduce it on a worksheet and customize functions. They test solutions for each situation and adopt a flexible work method that will allow them to make adjustments at each step. In this way, they develop the ability to *solve problems*.

- **Methodological Competency**

In order to deal effectively with specific situations requiring the use and integration of supplementary subject-specific content, adult learners must *adopt effective work methods*. They consult the documentation available and get an idea of the desired result. This step allows them to analyze the situation, organize their ideas, determine the necessary resources and draw up a work schedule. As they carry out their project, adult learners follow their plan and make adjustments to it, as needed.

## SUBJECT-SPECIFIC CONTENT

The subject-specific content consists of knowledge and cultural references.

## KNOWLEDGE

- ***Context associated with specific situations requiring the use and integration of subject-specific content that complements that of the other courses in the program***

- ***Conceptual schemes involved in dealing with specific situations***

  - Main concepts, objects and properties of objects

  - Functions and procedures

  - Tools and commands

  - Input and output

- ***Understanding the necessary commands and functions***

  - Identifying the possibilities of the application

  - Identifying the commands and functions required for the project

  - Using the necessary documentation and resources

- **Dealing with specific situations**

  - Using the commands and functions and, if applicable, creating and modifying objects

  - Reviewing the product or process

  - If applicable, disseminating the final product

## CULTURAL REFERENCES

The following cultural references will help adults understand some of the factors that influenced the development of computer science. These references give a cultural dimension to instruction, expand the adult learners' knowledge and make their learning meaningful. The teacher, with input from adult learners, may choose other references that are more appropriate to the task at hand.

- **Events and chronology**

  - Evolution of specialized software addressing the issues associated with the situation

  - Genealogy of families of computer applications

- **Heritage objects**

  - Old objects used to address the issues associated with the situation

- **Regional or national references**

  - Employers

  - Anecdotes

  - School-related elements

## FAMILIES OF LEARNING SITUATIONS

The goal of the *Supplementary Computer Training* course is to help adult learners develop the means to use their insight, acquire new knowledge and develop computer competencies beyond the level required in the other courses in the program. This course gives adult learners the opportunity to produce quality computerized documents.

The shaded cells in the table below provide specifics about the contexts in which the prescribed families of learning situations are applied in this course.

| Subject-specific competencies | Families of learning situations related to . . . | | |
|---|---|---|---|
| | Information | Creation | Critical thinking |
| **Interacts in a computer environment** | Interacts by interpreting signals he/she receives and using input and output peripherals | Discovers what computers can do by consulting documentation and by experimenting | Critically examines computerized communication tools by applying evaluation criteria |
| **Produces computerized documents** | Communicates by using computerized services | Creates by correctly using the appropriate functions | Evaluates his/her work by setting quality standards |
| **Adopts behaviours that reflect a concern for ethics, safety and critical thinking** | Communicates respectfully, using the conventions of a given medium | Acts prudently by adopting safe behaviours | Validates information by using validation criteria |

First, adult learners discover what computers can do by consulting documentation and by experimenting. For example, they may determine what is feasible or choose the right tool to carry out a project.

Then, adult learners create documents by correctly using the appropriate functions and thus work more efficiently. They take the time to evaluate their work by setting quality standards, or by taking into account the standards that have been set for them, in order to get an accurate sense of the results of their efforts.

## BROAD AREAS OF LEARNING

The broad areas of learning deal with major contemporary issues. Ideally, the situations to be studied should be selected in keeping with the educational aims of the broad areas of learning, since these areas of learning provide a broader context for the learning situations and thus serve to make learning more meaningful. Two broad areas of learning are considered particularly relevant to this course: Career Planning and Entrepreneurship, and Citizenship and Community Life.

▪ **Career Planning and Entrepreneurship**

By developing computer competencies, adult learners increase their overall employability. A learning situation that helps adult learners become aware of the importance of continuing education in the workplace meets the educational aim of the BAL Career Planning and Entrepreneurship.

▪ **Citizenship and Community Life**

The Computer Science program gives adult learners the opportunity to experience the principles that are the basis of equal rights in our society. A learning situation that makes adult learners aware of networks that can help them further develop their competencies meets the educational aim of the BAL Citizenship and Community Life.

## EXAMPLE OF A LEARNING SITUATION

All learning situations, no matter what broad area of learning is targeted, place adult learners at the heart of the action. Learning situations promote the development of subject-specific and cross-curricular competencies, the acquisition of computer knowledge and skills and the mobilization of various resources that are useful in carrying out the tasks at hand.

The table below shows the elements that need to be considered when developing a learning situation and highlights those selected for the learning activity described on the following page.

| ELEMENTS REQUIRED IN LEARNING SITUATIONS | |
|---|---|
| **Broad area of learning** (targeted)<br>- Contextualizes learning to make learning more meaningful | • Career Planning and Entrepreneurship |
| **Subject-specific competencies** (prescribed)<br>- Are developed in action and require the active participation of adult learners | • Interacts in a computer environment<br>• Produces computerized documents |
| **Families of learning situations** (prescribed)<br>- Group together situations appropriate to the course, based on issues drawn from reality<br>- Promote the acquisition of computer knowledge and skills | • **Creation**<br>  o Discovers what computers can do by consulting documentation and by experimenting<br>  o Creates by correctly using the appropriate functions<br>• **Critical thinking**<br>  o Evaluates his/her work by setting quality standards |
| **Cross-curricular competencies** (targeted)<br>- Are developed in context together with the subject-specific competencies | • Solves problems<br>• Adopts effective work methods |
| **Knowledge** (prescribed)<br>- Includes computer knowledge and skills that adult learners must acquire in the course | • Conceptual schemes involved in dealing with specific situations<br>• Planning and dealing with specific situations requiring the use and integration of subject-specific content that complements that of the other courses in the program |

This section provides an example of a learning activity. It includes a context that serves as a common thread throughout the activity; however, it is not formally spelled out. Although they may not be explicit, the learning situation includes the elements identified in the previous table: the broad area of learning, the subject-specific competencies, the families of learning situations, the cross-curricular competencies and the prescribed knowledge. To promote learning, these elements must be structured in a coherent and meaningful way.

Teachers can target any element as a focus of learning, be it actions related to the subject-specific or the cross-curricular competencies or the prescribed knowledge that adults must acquire.

## EXAMPLE OF A LEARNING SITUATION

**Mortgage or personal loan**

**Task:** Using an electronic spreadsheet, produce a file to accurately calculate monthly payments for a Canadian mortgage and a personal loan, based on two functions created by adult learners.

To start off the activity, the teacher explains that, although most electronic spreadsheets contain a financial function for calculating reimbursement payments (PMT), this function does not yield the same results as those of Canadian financial institutions. This is because, in Canada, mortgage interest is calculated semiannually, whereas interest on a personal loan is calculated monthly. It is therefore more appropriate to create two new functions to calculate these two types of payments.

In this activity, adult learners use an electronic spreadsheet mainly to create macros or new functions and integrate them into a worksheet. They plan their project in advance and, in collaboration with the teacher or their peers, analyze their results at each step, regulating their approach based on the requirements of the situation.

To carry out the activity, adult learners must draw on their existing knowledge. They are not expected to master all of the course content before they start their project; rather, they will construct their knowledge as they work, using the means at their disposal: the documentation provided, planning, communication with peers (when the situation permits), and reflection and review.

## END-OF-COURSE OUTCOMES

This course deals with the context surrounding specific situations requiring the use and integration of subject-specific content that complements that of the other courses in the program, the related concepts, the planning involved, and the treatment of these specific situations.

When adult learners *discover what computers can do*, they familiarize themselves with the main concepts of the application by consulting the program's documentation, the tutorials and any other relevant source of information. They explore the capabilities and limitations of the application's tools and commands by using these in concrete activities. In this way, they develop strategies that they can apply in their project.

When adult learners *create*, they analyze the current situation and determine the additions or modifications they will make to obtain the desired result. After the analysis, they develop an approach, determine the steps involved in carrying out the work, identify the necessary resources and draw up a work schedule. They mobilize their knowledge and skills, and use the application's commands and functions appropriately. They adopt a flexible approach that allows them to make adjustments as they carry out their project.

When adult learners *evaluate their work*, they analyze their results and determine the improvements to be made and the means of doing so. They take stock of their ability to produce computerized documents by recording their observations, and set quality standards that they will be able to apply in future projects.

Throughout the learning process, adult learners develop competence in the following computer knowledge and skills: they define the objectives of the work to be done, plan their project, and use the application's commands and functions appropriately. In addition, they do not hesitate to consult various resources to obtain help when difficulties arise.

## EVALUATION CRITERIA

### Interacts in a computer environment

- Use of appropriate strategies to interact and to troubleshoot

### Produces computerized documents

- Thorough planning of the work

- Appropriate formatting based on document type

- Application of appropriate tools and functions

- Rigorous compliance with the constraints identified