

# *Lifelong Learning Programme 2007-2013*

## Leonardo da Vinci

### SINAPSI PROJECT

#### D 7.2 – 7.3 Assessment & learning methodology, learning evaluation

#### 2 Version

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## Introduction to version 2 of the deliverable

### “Assessment and learning methodology, learning evaluation protocol”

In this document we propose the same methodology framework used in the first Sinapsi trial for assessment and learning activities and also for the evaluation protocol.

We decide to do so, because of the results of the trials, indeed we need a very flexible frameworks to deal with countries main differences and characteristics, and the methodology that we outlined in the first part of the project, works effectively in the management of differences we met.

All the countries involved were able to follow the main methodology guiding lines, thereby respecting the nature of the assessment and training phase. At the same time every nation has customized the phases, adding tools to support activities both in the assessment and training phases. The most common scenario was to manage the debriefing phase using other environment such as skype or messenger or other software for e-comunication.

More details on this topic in the D.6.1 and D.6.2 Evaluation report of the trials (see French and Slovakja experience)

In Italy we maintain all the activities of the Sinapsi project, in the Sinapsi platform for testing any weaknesses of the methodology. The main result is that the methodology works by handling all without any further support. For this reason we maintain the same validated methodology.

The differences are mainly due to different curricula of the participants, i.e different seniority, and first of all to the trainer habits in managing learning groups.

## Definition and Purpose

A learning methodology is a systematic approach to learning that can be applied to the development of a technical system to enhance and expedite and effective learning.

This goal of this document is to describe how the Sinapsi project will embraced training process, focusing on training and assessment.

The goal of the Sinapsi learning methodology is to provide learning knowledge available with innovative and technology based learning tools\*. Learning Methodology accomplishes this by ensuring the development of a robust and flexible learning process. A learning process where training activities reflect the perspectives of two critical contributors: the developers of the tools and methodology and the final users, providing a system that supports the users in effective development of the identified critical individual or team core competencies.

This Learning Methodology Document explores the application of Learning Methodology to the design, development and fielding of a blended simulation on line based training system.

The labour market and training systems have been affected by profound socio-economic, technological and demographic changes. These changes have shown the importance of employability and the need to empower individuals by equipping them with the skills needed to stay in employment throughout their working lives.

\*Sinapsi will use a 2D and 3D on line platform during the assessment and in training phases, in a blended way.

## The Sinapsi learning Methodology pattern

The figure a. Sinapsi general pattern (p.4), show how is designed the entire process, start from needs analysis until learning evaluation results.

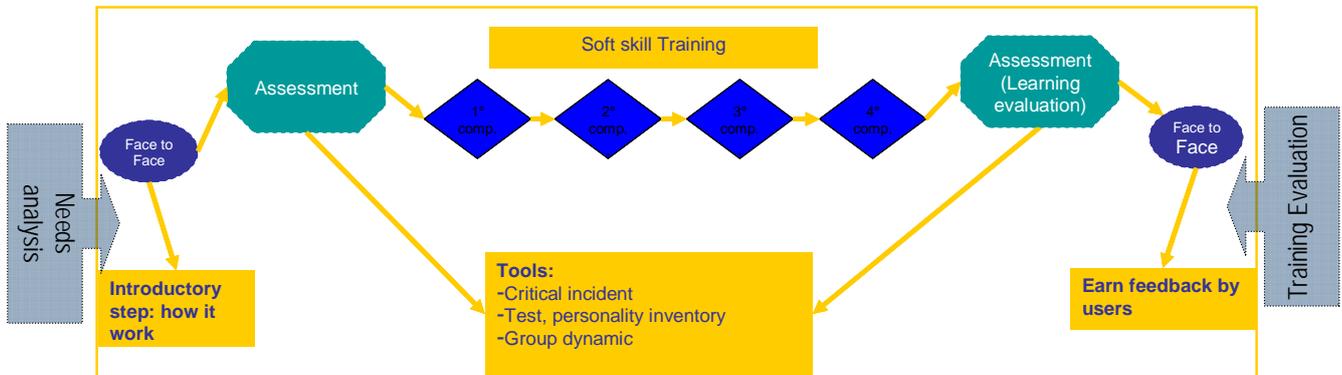
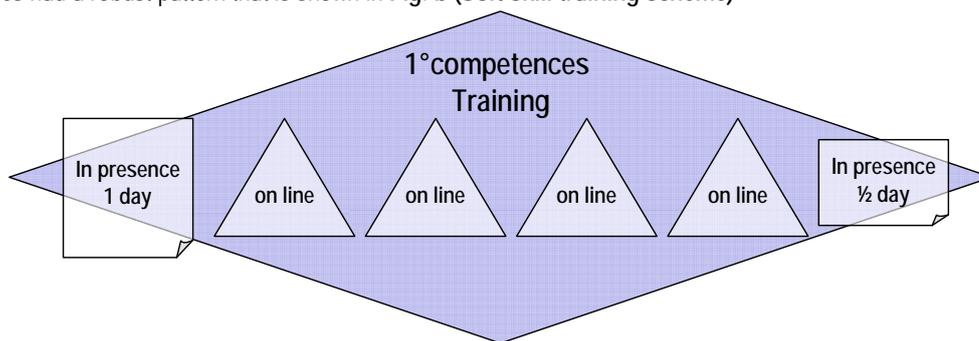


Fig. a. Sinapsi general pattern

Picture a. design the entire sinapsi project

The learning methodology in this document is focused on the soft skills training phase and the training evaluation. The structure of each competence had a robust pattern that is shown in Fig. b (Soft skill training scheme)



### Competence oriented learning process

Fig. b, design a typical competence oriented learning process. The main steps are:

In presence training: the first step begin with a face to face session

On line training: several (2 or 4 time) online training meeting to test new behavior, solutions related to the specific competence aim of the training session. In presence training: at the end, one more face to face meeting for summarize the experience. This point will be deepened in the next paragraphs. The number of the online session required it depends on the characteristics of the core competence trained.

After the competences training, at the end, participants will involved in an assessment session. The aim of this step is to appreciate any competences improvement. This is a core tool of the evaluating process.

## Evaluation phase: Assessment methodology

### ***What are Assessment Centres?***

Essentially, assessment centres are group-based exercises which seek to examine how candidates will behave in group and team situations in the workplace.

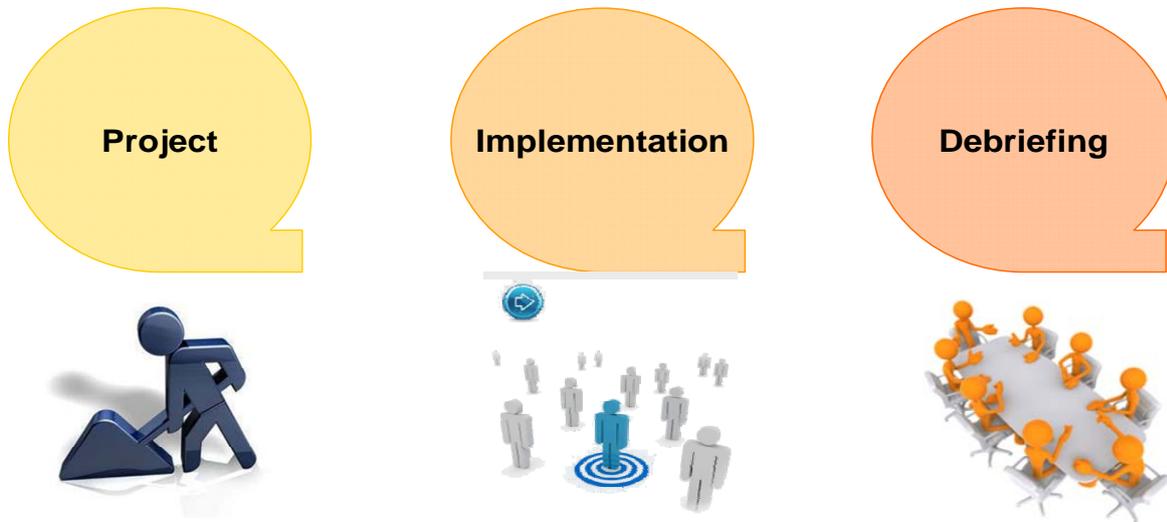
They are a fairly common means of selecting people at all levels within an organisation, and are also used for staff development purposes.

### ***Why run them?***

Organisations are turning to assessment centres for graduate recruitment because they are the best method presently available for predicting how well people will perform at work. Assessment centres are designed to assess candidates' aptitude for a role, or perhaps provide a basis for personal development. Irrespective of the purpose, they have the following characteristics:

1. They involve a group of participants, between four and eight is best, with a realistic minimum of four candidates for each job available or in each group.
2. The candidates are assessed by a group of trained assessors, none of whom is individually responsible for the final decision on any particular candidate. All of the information is shared in a final session, where consensus decisions are reached on all candidates.
3. The candidates undertake a number of assessment 'instruments' (eg. group exercises, presentations, in-tray exercises and role-plays), normally over a lengthy period (between one and four days, with a typical centre being two days long).
4. Each candidate is assessed against a number of pre-defined, objective, job-related behavioural scales or competencies.

## Main bricks:



Picture a. design the entire Assessment Process

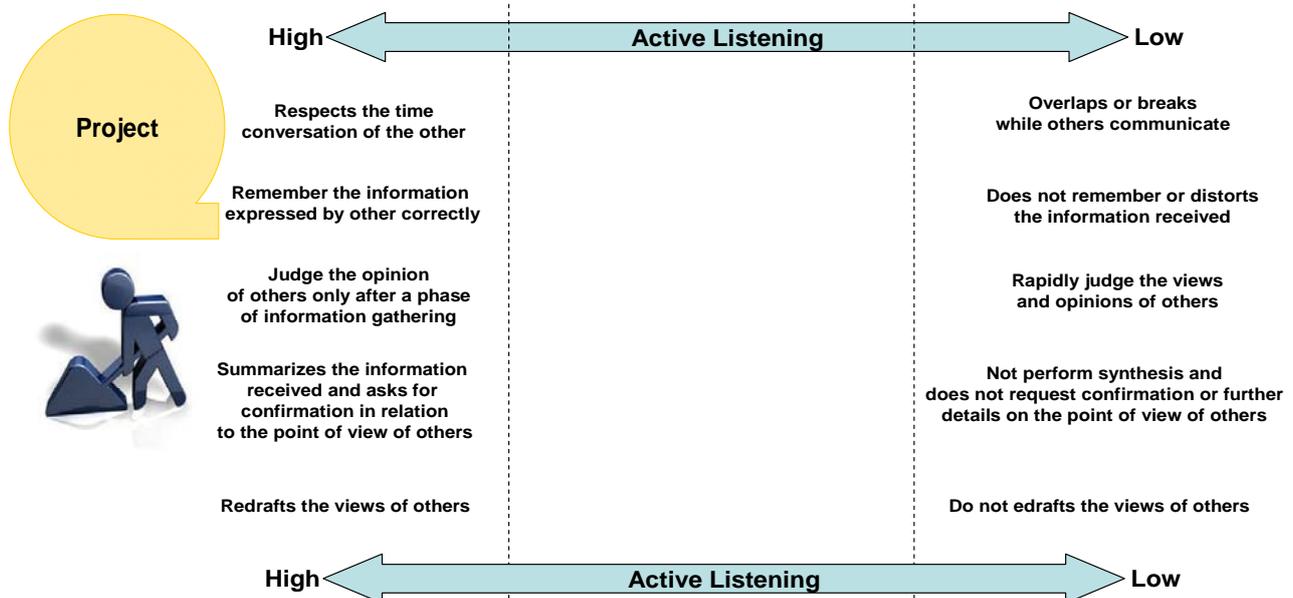
An Assessment Center is a comprehensive evaluation approach that allows candidates an opportunity to demonstrate their skills in a number of different situations. Its primary purpose, however, is to evaluate skills and abilities

### First Brick: The Project

1. **A job analysis** of relevant behaviors must be conducted to determine the competencies (dimensions, attributes, characteristics, qualities, skills, abilities, motivation, knowledge) or tasks that are necessary for effective job performance and to identify what should be evaluated by the Assessment Center.
2. **Define core competencies and the rating scale.** A rating scale is a set of categories designed to elicit information about a quantitative or a qualitative attribute. In the social sciences, common examples are the Likert scale. (for further information [http://en.wikipedia.org/wiki/Likert\\_scale](http://en.wikipedia.org/wiki/Likert_scale))
3. **The instruments (= Scenario)** used in the Assessment Center must be designed to provide information for evaluating the competencies. (What kind of Scenario we would prepare? How many Scenario would we use to assess that competences?)
4. **Share the evaluating dimension, scale and criteria with the Assessors:** (1) how to observe and record behavior; (2) how to classify behavior into assessment competencies; and (3) how to rate (or evaluate) the behavior pertaining to each competency.
5. **Define logistics and organizational matters**

6. **Multiple assessors** used for each candidate: there should be one assessor for every two candidates. Please see the document “Assessment Center Process” attached, for further details.
7. **Multiple observations made for each dimension**, it means multiple Scenario for each competences (max 3 scenario cad.)

### Focus on: defining and rating dimension



### Sample scale for rating dimensions

- 5: Much more than acceptable: Significantly above criteria required for successful job performance
- 4: More than acceptable: Generally exceeds criteria relative to quality and quantity of behavior required for successful job performance
- 3: Acceptable: Meets criteria relative to quality and quantity of behavior required for successful job performance
- 2: Less than acceptable: Generally does not meet criteria relative to quality and quantity of behavior required for successful job performance
- 1: Much less than acceptable: Significantly below criteria required for successful job performance

## Second Brick: Implementation

The following represents a common implementation of an Assessment Center Session:

- **Presentation of the assessor**
- Presentation of the **purpose and methodology** of the Assessment
- **Candidates participate in a series of exercises** that simulate on- the job situations (Scenario)
- **Other tools** i.e. questionnaire, test...
- **Assessors** carefully **observe and document the behaviors** displayed by the participants. Each assessor observes each participant at least once
- **First debriefing** with all the candidates at the same time: stock the experience. Use open question to investigate i.e. how did it go? How did you work? There where alternatives available?
- **Output timing and regards**

## Third Brick: Debriefing

1. **Assessors individually write evaluation reports**, documenting their observations of each participant's performance
2. **Classifying Behavior:** The basis for rating candidates in an Assessment Center is the behavior that they demonstrate with regard to the critical assessment competency being evaluated.
3. **Rating Behavior:** Assessors must make judgements about the degree of the competency demonstrated through the behavior; they must rate the effectiveness of the behavior in terms of the competencies. It is essential that assessor ratings be consistent and reliable. Therefore, it is advisable to require that all assessor ratings be within one point where a five-point rating scale is used.
4. **Integration Round:** The integration session refers to the “pooling” of information and observations by assessors to determine candidate scores. Assessors share the information they have collected to develop an overall, comprehensive picture of each candidate. Assessors integrate the data through a consensus discussion process, led by the center administrator, who documents the ratings and decisions

5. **Final Output: fill the report!** Once set the final score for each competences, the Assessor have to summarize all the information in a report.

### **Focus on report: Report carry some strategic information**

1. Biographic information (name, age, role)
2. Definition of each competences with the score assign by the commission (quantitative information)
3. Qualitative comment: at least 20 lines describing the candidates behaviour for that competence.
4. A short list made with bullet point of strenghts and weaknesses
5. Only if questionnaire or test were used: text comment or a graph that summerize results.

For further details see report in document attached (**Report AC: Evaluation Board for Assessor**)

### **Training phase: the objectives**

The goal of training phase is to develop the competences highlighted through the assessment phase. For each of competences emerged from the assessment will be necessary design specific training modules to be executed partly in presence and partly online. In broad terms we can distinguish 8 main steps respect to the design of a training program:

1. Determine participant's needs
2. Define purpose of the training and training audience
3. Define training goals and objectives
4. Outline training contentes
5. Define instructional activities, tools and instruments
6. Plan the didactic activities
7. Define the metodological approach
8. Prepare evaluation forms

Respect to SINAPSI project the first two items listed are held during the assessment. Through a process of analysis, training needs are defined in terms of competences. Point '3' is very important for a good training design. An objective is an intent communicated by a statement describing a proposed change in the learner. The statement should describe the behavior the trainee will demonstrate at the end of the training. Training objectives must follow a definite format to be useful. According to this approach must contain three elements:

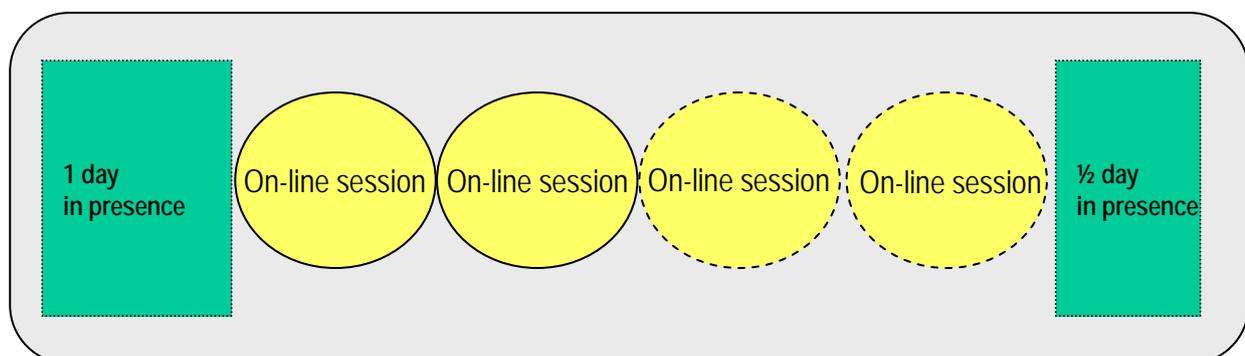
- 1 – The Terminal Behavior (define the capabilities intended to achieve to the end of the training)
- 2 – The Conditions (the circumstances under which the terminal behavior must be evident)
- 3 – The Standards (the performance level or quality expected to be achieved)

*Example:*

“At the end of the course participants will be able to independently pursue trade negotiations with different types of customers, while remaining within the margins of discounts and ensuring a positive customer service feedback”

### **The training brick:**

The design of the training courses will be based on specific training modules described below. Regardless of the competence concerned the training will be conducted in accordance with the following model that represents the 'training brick' of the project. The structure of each training module is represented in the picture below.



As shown in the picture, each module includes a first day in presence; from two to four sessions online and a half day closing in presence. The objectives of the different phases of the training module are:

- The first day will address two goals (a) sharing objectives and methodology (b) transfer models and tools to developing the competence addressed.
- The on line sessions will be devoted to practice the models and tools shared in the first day. Participants will be asked to solve cases and exercises specially designed. Through the support of a tutor who will provide feedback to participants on the cases it will be possible to work in the specific competences.
- The last ½ day in presence will address two goals: (a) verify the learning level achieved against objectives set (b) assess the level of approval of the module and analyze the strengths and limitations.

The following are the main steps of the **first day in presence**:

- Definition of the topic and sharing goals
- Presentation of reference models in respect to the competence addressed
- Contextualization of the models compared to the experience of participants
- Testing of models learned
- Sharing of the online methodology

1 day  
in presence

And the following are the main steps of the **last ½ day in presence** terminating module

- Summary of contents
- Participants self-evaluation respect to the learning path
- Feedback of the tutor on the level of learning of the group and the dynamics inside the team involved in the training
- Individual Feedback (possibly made through a conversation face to face)
- Evaluation of the module by the participants

½ day  
in presence

**The online sessions** are a very important part of training modules. The didactic approach followed during these phases will be inductive: starting with a series of cases that the tutor will submit to the participants will be able to perform analysis and exchange feedback. The reflection on the cases undertaken, in the light of shared models, will highlight the strengths and limitations of the participants and allow to identify new behavioral strategies, new possible solution to the problem. These new behavioral strategies can then be tested by participants in subsequent simulations. Through this process of assimilation and accommodation, facilitated by the feedbacks of the tutor, the new behavioral responses will be integrate in the of skills of participants.

The following are the main steps of the **online session**:

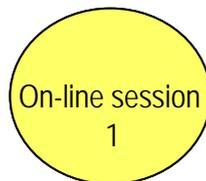
- Admission of participants in the system
- Sharing of **case and rules** to be followed during the exercise
- Resolution of the case by the participants
- Possible **events** produced by the tutor
- Possible **feedback** by the tutor during the exercise
- Conclusion and analysis of the results in plenary
- Writing the **personal feedback** from the tutor for each participant
- Sending of the personal feedbacks to the participant



## The personal feedback

**The personal feedback** is a specific powerful tool to be used by tutors to facilitate learning. It consists of a summary document which the tutor compiles after each online session and submit to participant. The use of personal feedback is described below.

After each session, the tutor fills out a document that provides feedback to participants on their performance. The document has a structure like that shown below.



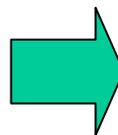
**Personal feedback**

What I have observed:.....

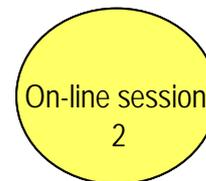
What I liked :.....

You should :

- Behavior 1
- Behavior 2
- Behavior 3
- Behavior 4



The next session is handled in the same way. After the exercise the tutor compiles personal feedback...



**Personal feedback**

What I have observed:.....

What I liked :.....

You should :

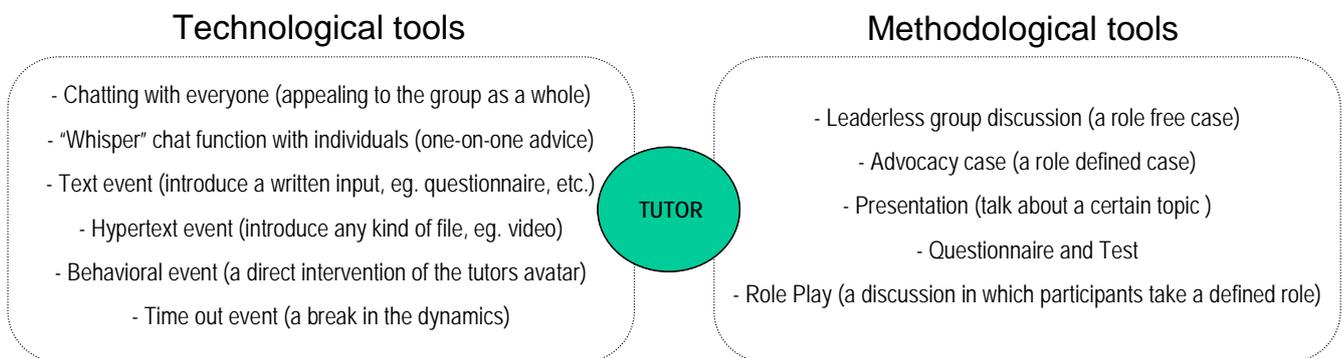
- Behavior 1
- Behavior 2
- Behavior 3
- Behavior 4

the observations are related to the behavior of the participant. In the next the participant session will follow at least 2 suggestions provided by the tutor.

Even in this case is asked to participant to use 2 or more suggestions in the next session. The modeling process is repeated in subsequent sessions.

## The tools

Within the online sessions the didactic is linked to the tools that the tutor has left. We must distinguish between and methodological tools. The former are related to specific functions that the platform provides the tutor to interact with participants. The latter are related to teaching methods, that is specific content designed to elicit a particular response. The following picture resume both the kinds of tools.



Will then be up to the tutor to use the two kinds of tools considering the characteristics of the scenario and its goals. Subsequently are some indications for design of scenarios

## The Scenario:

The scenario is the situation when participants are asked to interact during the online sessions. The scenario has two main components: a context and one or more goals. The first is the description of the situation in witch participants will act. In this way we can distinguish between: contextualised and not-contextualised contexts. The first concern of problems related to the real work experience of participants. The second are problems of fantasy distant from the experience of participants. The choice to use one or the other will be made from time to time in the design phase. The objective are the goals the participants are asked to achieve. In any scenario will always be an overall objective, that is assigned to the whole group. In some scenarios may be individual goals, that is assigned to each participant. In this case another important component of the scenario will be the definition and the attribution of a specific role to the participants.

The scenarios used in training has different objectives than those used in assessment. However, some of the considerations applicable to them are useful for the scenarios of training. Here are some design guidelines derived from tests performed.

- Duration of the scenario between 20 and 30 min (less than 10..)
- Number of participants between 4 and 6
- Importance of the initial phase of information sharing (situation, objectives, roles)
- Importance of the tutor who has three main functions: technical assistance; methodological supervision; learning facilitation

The role and the competences of the figures involved in the training processes are discussed below.

## Professional profile involved

### Training designer

**ROLE:** Identifies and analyses the needs of the learners and design packages, which might contain a set of instructional brief or script for a training course, along with the handouts and training aids. At simpler level the designer might design the broad structure of necessary training, including the overall objectives, the pass to the responsible trainer the detailed programme. In designin training programs, keeps in mind:

- the needs analysis output
- the times available for the training

### The output of the training design:

1. definition of the macro objectives to reach;
2. definition in detail of the individual sessions of training:
  1. Objective
  2. Micro Arguments to treat in
  3. the Material to use
  4. Time for every form of the session
  5. Checks

**SKILL:** The designer knows the behavioral psychology and the theories on the learning of the adults, the formative process in its systemic variables to analytic level, the theory of the

Training design as well as the tools, the methodologies and the formative technologies adequate to the different phases of the formative process.

**TIPS:** Works closely with clients and employees to gain feedback on existing and future training programs and delivery method

## **Trainer**

### **ROLE:**

1. deliver the contents
2. orientate the motivation and the attention of the participants, managing adequately the climate of classroom and favoring the participation and the interaction. He/She re-elaborates, therefore, the contents in function of the participants with clarity and property of language, using the supports and the subsidies traditional and advanced and respecting the teaching planning in the times and in the contents.

**SKILL:** expert specialist of contents in the formative process, that knows to integrate adequately the actual personal skills/professional with the requirements of the formative route, to reach the definite objectives. The trainer knows the formative process in its systemic variables, the contents and the organizational management. It garrisons besides the formal procedure of planning, accomplishment and evaluation of the teaching unit and the variable of the dinamycs of group and to the interpersonal relations.

### **TIPS**

- Providing positive reinforcement and motivation
- Demonstrating effective presentation and communication skills
- Demonstrating effective questioning skills
- Responding appropriately to learners' needs for clarification or feedback

## **E- Tutor**

**ROLE:** manage of e-learning and simulation lessons using a variety of development tools, being able to orientate the teamwok, providings advice, shares knowledge and experiences, and teaches using a low pressure. He/she:

- motivate trainees,
- promote, facilitate and re-direct their learning,

- establish co-operation and interaction between the trainees
- evaluate the acquisition of knowledge.
- Monitors the discussions sincrone to maintain the standard established

## **SKILL**

- The E-Tutor has consciousness of the dynamics involved in distance learning
- He/she knows how to use pages web for supply focal points for the information on the course, and to make respect the rules of netiquette on all the tools of communication used.
- Knows to open and to curb in effective manner the topic to maintain the standard established

**TIPS:** declaring how will manage all the communication via web

## Didactical Approach

“Many skills are often intangible and therefore not easily taught in a traditional classroom setting of books and lectures. An education methodology based on **constructivism** has proven to be more effective for “instructing” many soft skills. Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Each of us generates our own "rules" and "mental models," which we use to make sense of our experiences. Learning is simply the process of adjusting our mental models to accommodate new experiences. Constructivism calls for the elimination of a standardized curriculum. Instead, it promotes using course content customized to the students' prior knowledge. Also, it emphasizes hands-on problem solving.

The instruction team will use integrated course content incorporating Learning, Elearning and Workshops in order to help participants acquire the variety of skills they need. That is learning methodology designed to guide the learner towards a certain skill and/or content. The process of learning is focused on the learner and the **instruction** team is responsible only for guidance and management of the final initiative. The overall goal of the process is to drive the learner to develop a habit of self-education and create a culture of independent learning. PBL gives learners an opportunity to apply their knowledge in a virtual project through the assistance of a tutor. The **Tutor** provides advice, shares knowledge and experiences, and teaches using a low pressure, self-discovery approach. The tutor is both a source of information/knowledge and a Socratic questioner. Through this approach the learners gain hands-on skills, internalize what they have learned and then apply it to change their lives. Through that approach they will also be able to pass their knowledge on in a simple, clear and effective way to others; thereby becoming intermediaries of information use themselves and a source of lateral learning for their peers. This approach is a dynamic process that isn't full predetermined but rather evolves over time through a continuous dialog with stakeholders in order to properly align the program with the needs and realities. It has the learner focus on a problem that concerns him/her. The general idea is to build the specific skills the learner needs in order to solve a certain problem that he or she has identified.”

## Learning Evaluation

### Training Effectiveness Evaluation

One of the most critical components of the Learning Methodology is measures of effectiveness. How do we evaluate whether the blended tool is achieving its original objective: training? And how do we determine how well it is providing an effective learning environment? The following provides a framework for applying this part of the process to large scale training simulation systems and discusses the criticality of determining evaluation procedures before the build stage begins.

### Overview

This section develops and describes a proposed training effectiveness evaluation framework for large scale simulation training systems. First, it explores the rationale for evaluating training systems

### Rationale

Why Evaluate? Evaluations are conducted for a number of different reasons; obvious ones are to:

1. Satisfy milestone requirements
2. Assure that Sinapsi performance standards are met
3. Demonstrate cost and training effectiveness
4. Identify and correct developmental deficiencies
5. Identify and correct deficiencies in the management and use of training systems
6. Monitor competencies to support planning and execution of training events

All of these are sound reasons to evaluate. From a purely training standpoint, however, the focus shifts to reasons 2, 3, and 4: 2 and 3 because they show that the system works well and justifies its cost in some relatively mature end state; 4, because evaluations can help identify system shortcomings that can be corrected during development.

Many different dependent variables have been used in evaluating training. To date, no set of variables has gained universal acceptance. Thus, it is necessary to start from basics.

Kirkpatrick (1976) recommends that training programs be evaluated at four levels: **reaction, learning, behavior, and results**. Data gathered at each of these levels answer different questions about the effect of the training program on its students:

- Reaction - How well did users like the program?
- Learning - What did users learn while participating in the program?
- Behavior - How did job behavior change after the program?
- Results - What were the tangible results after the program in terms of reduced cost, improved quality, improved quantity, etc.?

Note that reaction and learning data are gathered during training and (behavior and results are gathered after training. Typical ways to gather data for each of these levels would be reaction (post-course questionnaire), learning (in-course tests), behavior (post-course supervisor performance evaluations), results (post-course productivity/quality of the student's work center).

### **When Should I Evaluate? (Timing)**

Evaluation is a lengthy process that should start before the system exists. Some purposes of evaluation at this phase are:

- Estimate perceived need for and training potential of system Define/refine training content
- Assure adequate learning environment

These questions can be addressed using analytical and opinion-based analyses; it may be possible to use extrapolation.

Later, during system development, software capabilities will be built, in stages, and it will become possible to evaluate these fledgling capabilities. Some purposes of evaluation at this phase are:

- Demonstrate training effectiveness of functioning systems
- Assess/refine design
- Estimate user acceptance

These questions can be addressed based on opinion (user acceptance) and simple experiments (functionality tests, user in-device learning experiments).

## Proposed Evaluation Framework:

Table 1. Proposed Evaluation Framework

Illustrating Purpose and Evaluation Methods by Evaluation Phase

Description Evaluation Phase	Prospective	Developmental	Milestone	Follow up
<b>When</b>	Before system exists	During system development	At major developmental milestones	After system becomes operational
<b>Purpose</b>	Estimate perceived need for and training potential of System. Define/refine training content. Assure adequate learning environment	Demonstrate training effectiveness of functioning subsystems Assess/refine design Estimate user acceptance	Demonstrate training effectiveness of total system · Assess/refine design · Determine user acceptance	Estimate transfer of training · Determine effects of training on readiness, use of resources, & overall performance
<b>How</b>	Analysis (functional analysis) · Analysis (survey) Opinion	Opinion (user) · Experiment (pre-) · Experiment (test)	· Opinion (user) · Experiment (quasi-)	Assessment Opinion (user) Experiment (ex post facto)

## Evaluation Board

Biographic information	<i>Surname</i>		
	Name		
	Date of birth		
	Role		

### - Assessor-

	<b><i>Name Surname</i></b>
First Assessor	
Second Assessor	

<b><i>Place and Date</i></b>	
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**Development notes**

Max. 10 lines