



**ENGINEERING and INDUSTRY  
INNOVATIVE TRAINING FOR ENGINEERS  
(ENGINEITE)**

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## **IO4-Task 5: Evaluation of the ENGINEITE programme**







Prepared by CUT



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## Task 5: Evaluation of the ENGINITE programme

The evaluation of the ENGINITE Training Programme was based on a set of questionnaires (see appendix).

CUT (P1) in collaboration with CUBEIE (P3) developed 4 different structured questionnaires. In particular, two questionnaires were developed for the evaluation of the ENGINITE Phase A (training programme), one questionnaire was developed for participating graduate engineers and one for the trainers. Likewise, another two questionnaires were developed for the evaluation of Phase B (Internship): One questionnaire was developed for the participating graduate engineers and one for the companies. What follows below is a presentation of each questionnaire.

### ENGINITE Phase A: Questionnaire for the participating graduate engineers

The *Questionnaire for the participating engineers* was comprised from four sections.

**Section 1: Personal info** aimed at collecting demographic information from the participating graduate engineers as follows:

- Name
- E-mail
- Gender
- Age
- Nationality
- Specialization
- Past experience: Participation in other professional programme / seminars
- Expectations from the ENGINITE training programme

**Section 2: Problem-Solving Inventory (PSI)** aimed at evaluating the participating young engineers perceived (a) problem-solving approach/avoidance style, (b) Personal control during the problem-solving process and (c) problem-solving confidence.

**Section 3: Feedback** from the participating engineers about:

- The overall ENGINITE training
- The Employability Enhancement & Managerial Skills courses (ENGINITE courses A1-A4)
- The Technical Knowledge Enhancement courses (ENGINITE courses B1-B4)
- The part of the training that liked the most
- The part of the training that liked the least
- The major challenges during the ENGINITE training
- Their suggested changes about the ENGINITE training programme (e.g., courses, content, duration, training days/times, etc.)
- The training topics/areas that they would like to receive further training
- The skills that they felt that need to develop further

**Section 4: Short testimonials** about the overall training experience from the participating graduate engineers.

## **ENGINITE Phase A: Questionnaire for the trainers**

The *Questionnaire for the trainers* was comprised from three sections.

**Section 1: Personal info** aimed at collecting demographic information from the mentors and trainers as follows:

- Name
- E-mail
- Gender
- Age
- Nationality
- Affiliation and position
- Academic work/background
- Specialization
- Past experience: Participation as a trainer/mentor in other professional programmes/ seminars
- Expectations from the ENGINITE training programme

**Section 2: Feedback** from the trainers about:

- The overall ENGINITE training
- The courses that s/he was responsible
- The part of the training that liked the most
- The part of the training that liked the least
- The major challenges during the ENGINITE training
- Their suggested changes about the ENGINITE training programme (e.g., courses, content, duration, training days/times, etc.)
- The training topics/areas s/he would you like to receive further information/material/additional support to develop their training better
- The main improvements that they identified on students during the enactment and implementation of the courses

**Section 3: Short testimonials** about the overall training experience from the participating trainers.

## **ENGINITE Phase B: Questionnaire for the participating graduate engineers**

The *Questionnaire for the participating engineers* was comprised from three sections.

**Section 1: Personal info** aimed at collecting demographic information from the participating graduate engineers as follows:

- Name
- E-mail
- Gender
- Age
- Nationality
- Specialization
- Company (in which their internship took place)
- Past experience: Participation in other structured internships
- Expectations from the ENGINITE structured internship

**Section 2: Feedback** from the participating graduate engineers about:

- The overall ENGINITE structured internship
- Their overall achievements during the internship
- The most important positive aspects of the internship
- What should be improved and their recommendations about the ENGINITE internship.

**Section 3: Short testimonials** about the overall internship experience from the participating graduate engineers.

## **ENGINITE Phase B: Questionnaire for the companies**

The *Questionnaire for the participating companies* was comprised from three sections.

**Section 1: Personal info** aimed at collecting demographic information from the intern supervisors as follows:

- Name of the intern supervisor
- E-mail of the intern supervisor
- Gender of the intern supervisor
- Age of the intern supervisor
- Nationality of the intern supervisor
- Position of the intern supervisor
- Academic work / Background of the intern supervisor

**Section 2: Company demographics** aimed at collecting demographic information from the participating companies follows:

- Company name

- Company's field of work
- Number of employees
- Type of knowledge and competences specific to the company that the internship supposed to develop
- Methods of knowledge transfer applied
- Technologies that the intern was exposed to
- Professional backgrounds of the employees that worked with the intern

**Section 3: Feedback** from the participating companies about:

- The overall ENGINITE structured internship
- The usefulness of the internship to the intern
- Suggestions for future internships in terms of duration/preparation/structure/students' profile
- Suggestions for the overall ENGINITE training

**Section 4: Short testimonials** about the overall internship experience from the participating companies

## Appendix

### 1. The Problem-Solving Inventory

## The Problem-Solving Inventory [PSI]

A rich line of research has developed around how people appraise their applied problem solving; that is, how they evaluate their problem-solving capacities, and in turn how such an appraisal affects a range of psychological, physical, and vocational outcomes (Heppner, Witty, & Dixon, 2004). This line of research has used the Problem-Solving Inventory [PSI] (Heppner & Petersen, 1982; Heppner, 1988), which is often regarded as the most widely used self-report measures of applied problem solving (Nezu, Nezu, & Perri, 1989).

The PSI is designed to measure adults' perceptions of problem-solving ability.

Grounded on the hypothesis that an individual's appraisal of one's problem-solving skills will affect one's problem-solving performance and the whole problem-solving process, Heppner and Petersen (1982) developed the PSI.

The PSI is a widely used instrument which assesses perceived problem-solving competence, as a review of over 120 studies has shown (Heppner, Witty, & Dixon, 2004). It measures perceptions of one's problem-solving ability, also including behaviors and attitudes associated with problem-solving styles (Heppner & Baker, 1997).

It yields three underlying dimensions, Problem-Solving Confidence, Approach-Avoidance Style, and Personal Control. Not only are these factors intercorrelated, but they have been proven to be distinct dimensions.

The cultural validity of PSI, as well as its internal consistency, have been supported by many studies which have been conducted in Italian high school students (Nota, Heppner, Soresi, & Heppner, 2009), Mexican American high school students (Huang & Flores, 2013), adolescents in Hong Kong (Cheng & Lam, 1997) and Nigeria (Salami, Oyesoji, & Aremu, 2006), college students in Midwestern USA (Heppner & Petersen, 1982), Turkish college students (Sahin, Sahin, & Heppner, 1993), South African college students (Heppner, Pretorius, Wei, Lee, & Wang, 2002), African American college students (Neville, Heppner, & Wang, 1997), French Canadian adults (Marcotte, Alain, & Gosselin, 1999) and Greek educators (Kourmoussi, Xythali, Theologitou, & Koutras, 2016).

The Problem Solving Inventory (PSI) (Heppner & Petersen, 1982) is a 32-item instrument that measures the individual's perceptions regarding one's problem-solving abilities and problem-solving style in the everyday life. As such, it measures a person's appraisals of one's problem-solving abilities rather than the person's actual problem-solving skills.

It consists of three factors, thus yielding three separate subscales.



Problem-Solving Confidence (11 items) assesses self-perceived confidence, belief and self-assurance in effectively solving problems (e.g., “I am usually able to think up creative and effective alternatives to solve a problem.”).

Approach-Avoidance Style (16 items) assesses whether individuals tend to approach or avoid problems (e.g., “When a solution to a problem was unsuccessful, I do not examine why it didn’t work.”). Higher scores reflect a style of avoiding rather than approaching problems.

Personal Control (5 items) assesses elements of self-control on emotions and behavior (e.g., “I make snap judgments and later regret them.”). Higher scores on PC reflect a more negative perception of personal control on one’s problems.

All items are scored on a six-point Likert scale, ranging from 1 = Strongly Agree to 6 = Strongly Disagree. A total score can be calculated as a general index of problem-solving appraisal that ranges from 32 to 192. Lower scores on each factor and on the total PSI score are considered more functional.

## The Problem-Solving Inventory [PSI] items

|  | Strongly disagree | Disagree | Somewhat disagree | Somewhat agree | Agree | Strongly agree |
|--|-------------------|----------|-------------------|----------------|-------|----------------|
| 1. When a solution to a problem was unsuccessful, I do not examine why it didn't work.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 2. When I am confronted with a complex problem, I do not bother to develop a strategy to collect information, so I can define exactly what the problem is.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 3. When my first efforts to solve a problem fail, I become uneasy about my ability to handle the situation.  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 4. After I have solved a problem, I do not analyze what went right or what went wrong.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 5. I am usually able to think up creative and effective alternatives to solve a problem.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 6. After I have tried to solve a problem with a certain course of action, I take time and compare the actual outcome to what I thought should have happened. | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 7. When I have a problem, I think up as many possible ways to handle it as I can until I can't come up with any more ideas.                                  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 8. When confronted with a problem, I consistently examine my feelings to find out what is going on in a problem situation.                                   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 9. I have the ability to solve most problems even though initially no solution is immediately apparent.  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 10. Many problems I face are too complex for me to solve.  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 11. I make decisions and am happy with them later.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 12. When confronted with a problem, I tend to do the first thing that I can think of to solve it.  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 13. Sometimes I do not stop and take time to deal with my problems, but just kind of muddle ahead.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 14. When deciding on an idea or possible solution to a problem, I do not take time to consider the chances of each alternative being successful.             | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 15. When confronted with a problem, I stop and think about it before deciding on a next step.  | 1                 | 2        | 3                 | 4              | 5     | 6              |

|  | Strongly disagree | Disagree | Somewhat disagree | Somewhat agree | Agree | Strongly agree |
|--|-------------------|----------|-------------------|----------------|-------|----------------|
| 16. I generally go with the first good idea that comes to my mind.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 17. When making a decision, I weigh the consequences of each alternative and compare them against each other.                                  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 18. When I make plans to solve a problem, I am almost certain that I can make them work.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 19. I try to predict the overall result of carrying out a particular course of action.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 20. When I try to think up possible solutions to a problem, I do not come up with very many alternatives.                                      | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 21. Given enough time and effort, I believe I can solve most problems that confront me.  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 22. When faced with a novel situation I have confidence that I can handle problems that may arise.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 23. Even though I work on a problem, sometimes I feel like I am groping or wandering, and am not getting down to the real issue.               | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 24. I make snap judgments and later regret them.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 25. I trust my ability to solve new and difficult problems.  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 26. I have a systematic method for comparing alternatives and making decisions.  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 27. When confronted with a problem, I do not usually examine what sort of external things my environment may be contributing to my problem.    | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 28. When I am confused by a problem, one of the first things I do is survey the situation and consider all the relevant pieces of information. | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 29. Sometimes I get so charged up emotionally that I am unable to consider many ways of dealing with my problems.                              | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 30. After making a decision, the outcome I expected usually matches the actual outcome.  | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 31. When confronted with a problem, I am unsure of whether I can handle the situation.   | 1                 | 2        | 3                 | 4              | 5     | 6              |
| 32. When I become aware of a problem, one of the first things I do is to try to find out exactly what the problem is.                          | 1                 | 2        | 3                 | 4              | 5     | 6              |

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