Evaluating Vocational Educators' Training Programs: a Kirkpatrick-inspired evaluation model

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Abstract

The aim of the paper is to describe the assessment model adopted by SCINTILLA Project, a project aimed at the online vocational training of young, seriously-disabled subjects and their subsequent work inclusion in smart-work mode. It will thus describe the model worked out for evaluation of the training program conceived for the vocational educators, a sort of transversal model comprising formal, non-formal and informal learning dimensions. The model is inspired by Kirkpatrick's four-level evaluation model.

INTRODUCTION

The SCINTILLA[1] (SCenari INnovativi di Teleformazione per l'Inclusione Lavorativa in LiguriA - Innovative Scenarios of Tele-Training for Work Inclusion in Liguria) project, conducted by the Institute for Educational Technology (ITD) of the National Research Council (CNR) with funding from the Liguria region, neatly fits into this context, aiming to study how network and mobile technologies (NMT) can be used to help training and work inclusion processes for subjects with serious physical disabilities who are confined to their homes (thus often referred to as "homebound").

In previous research projects (Trentin et al., 2013) concerning the training of homebound workers, two key issues linked to the work inclusion of these individuals emerged:

1. The acronym translated means "spark".

- the need to obtain new, more sustainable forms of support for their basic and continuous training, professional qualification and work inclusion, using particularly flexible methods (Ferrucci, 2014);
- the need of the EFPs (Enti di Formazione Professionale - Professional Training Bodies) concerned with work inclusion to educate their operators also in the use of instructional design methodologies (ID) for online training interventions. For these bodies in fact, experimenting with methods based on the use of NMT is a necessary step when dealing with users who might find unique opportunities for education and insertion into the production cycle in online training and smart working (CISCO, 2011; EAC, 2012), opportunities which are moreover tailored to individual needs and thus maximize subjects' social and working potential.

All this is in line with the indications of Art. 26, point 2 of the 2006 UN Convention:

"States Parties shall promote the development of initial and continuing training for professionals and staff working in habilitation and rehabilitation service […]"

Thus the main activities of the SCINTILLA project concentrated on:

- planning and experimenting a training program for educators (based on a mix of formal, non-formal and informal learning)[2], which addresses both online training methods, and smart work;
- working out and implementing an evaluation model for the whole training process.

THE TRAINING PROGRAM FOR EDUCATORS

The main feature of the training program for EFP trainers, as we have said, is its extension over the three dimensions: formal, non-formal and informal (Figure 1).

The *formal stage* was expressed in a basic training course conducted completely online and planned and managed by ITD-CNR staff.

The *non-formal stage* was developed when what had been learnt in the basic course was put into practice in the educators' first experience in (a) educating a group of homebound subjects online with regard to the

[2] It is clear that in a training program extending outside the real or the virtual classroom, there is no clear distinction between moments of formal, non-formal and informal learning. The intention of this article is to detect the preponderance of one type of learning over another in the various stages of the training program, from the basic training to new trainers' total autonomy in managing online training, their interaction with the companies to promote smart work, and finally the accompaniment of their students.

professional technological content required by the firms into which they were to be inserted, and (b) interacting with the firms to favor their students' working inclusion in smart working mode.

By "smart work" (SW) is meant a flexible working method, independent of time and space, which transcends the concepts of "work and office hours" as they have so far been traditionally understood. In fact, where work meets the new technologies, new opportunities are created which cannot be ignored and which imply a change of mentality as to the way of organizing and managing work.

In this stage, the same ITD-CNR staff who had previously supervised the training stage, then took on the role of backstage guides for the newly-trained trainers during their first experience of transferring the knowledge learnt during the course. This second stage is a very delicate one on which the success of the whole training program and also the consequent ROI (Return on Investment) may depend (Phillips, 1998).

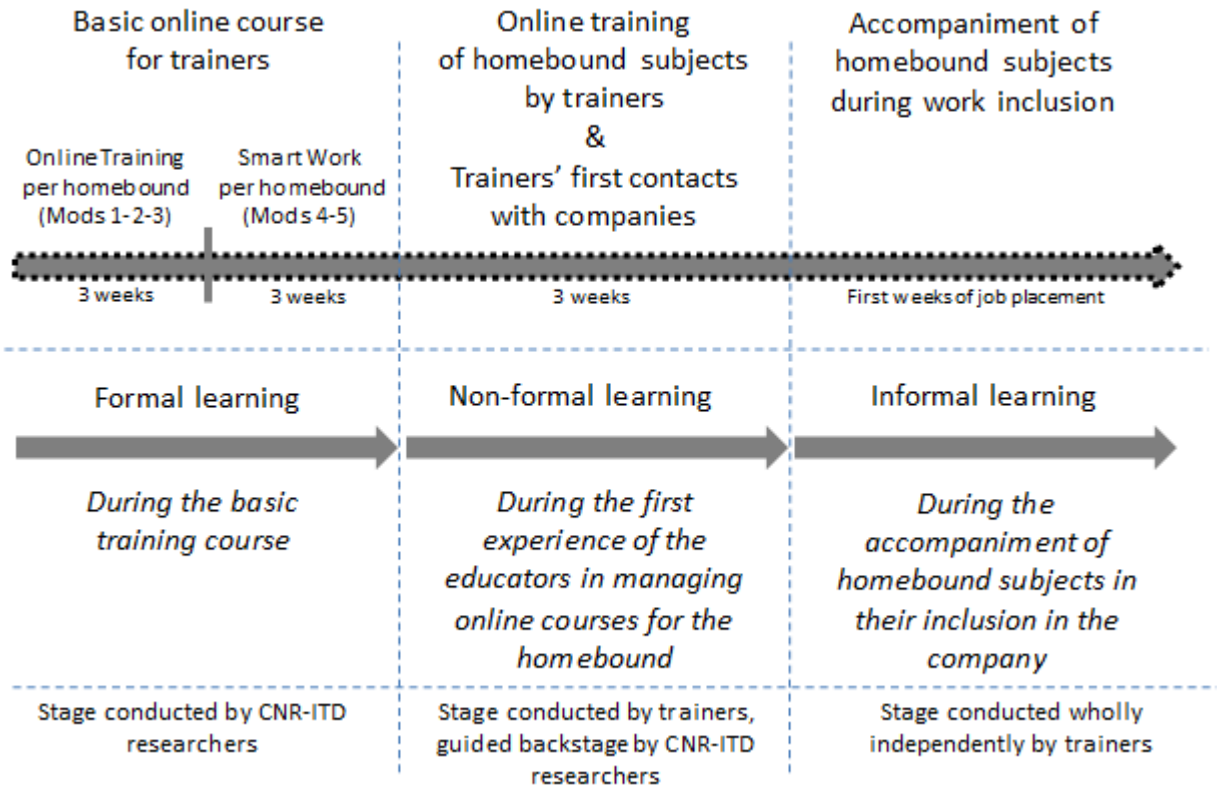

Figure 1. Development of the training programme over the formal, non-formal and informal dimensions.

The *informal stage* consisted of accompanying[3] the homebound subjects during the work inclusion process; an informal type of learning deriving from the periodical search for solutions in the delicate initial

[3] Speaking of seriously disabled subjects with great difficulties of movement or no mobility at all, who have however normal cognitive abilities, the "accompaniment" provided by their trainers obviously refers to the "process of insertion/inclusion in the

stage of work inclusion, when young homebound subjects' needs and those of the companies willing to take them on board need to be harmoniously matched.

The evaluation process for the whole training process was inspired by the model of Kirkpatrick (1998), which is divided into four levels (reaction, learning, behavior, result), each of which has a direct bearing on the following ones.

THE EVALUATION MODEL FOR THE TRAINING PROGRAM

In our proposal, Kirkpatrick's four evaluation levels (reaction, learning, behavior, result) were interpreted as follows:

Level I - Satisfaction and ideas for application (reaction)

This consists of measuring the degree of satisfaction of participants in a specific training course, as well as the ideas for application that this course suggests to them.

Although the first level is important, a favorable reaction on the part of the participants does not ensure learning of the contents and/or skills which are the training goals. A training intervention might in fact seem very useful and enjoyable to its users but be difficult to apply to their working context on a practical level.

Level II - Learning of the course contents (learning)

This addresses what the participant has learnt during the course; to establish this, tests, practical activities (project development), role-plays, simulations and other assessment strategies can be used.

However, positive results at this level still do not guarantee that participants are able to correctly apply what they have learnt. The literature abounds in examples of the gap which often exists between "knowing" and "knowing how to do" (Broad and Newstrom, 1992).

Level III - Practical application of what has been learnt (behavior)

There are several methods for follow-up analysis (Willen, 1981; Trentin and Vallarino, 2008), that is to say ascertaining how participants transfer the lessons of their training course into their professional context. One of these is direct observation of how newly-trained subjects apply the knowledge they have learnt and/or the skills they have acquired.

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production/working cycle" of the company which takes them on board and not to a physical accompaniment in the company production areas aimed at the start of an onsite job.

However, even if the assessment of the capacity for practical application of acquired knowledge is positive, there is still no guarantee that this will be translated into an equally positive impact of the training program in the newly-trained subjects' and/or their stakeholders' mother organization.

Level IV - Impact on the organization (result)

The impact may be measured at various levels: from the economic level to the level of satisfaction of the client (a company, an institution, a training body, etc.), to the level of improvement of the production cycle etc.

In the model proposed here, "organization" refers to at least two bodies: (a) the institution to which the newly-trained subjects belong, i.e. the EFP, and (b) its stakeholders, i.e. the companies/firms with which it is in contact for the work inclusion of its students (in our case, seriously-disabled ones).

Undoubtedly, measurement of the impact on the organization is not only the level which is the most complex to evaluate, but also the one which needs longer observation times in order to achieve reliable results.

APPLICATION OF THE PROPOSED MODEL TO THE TRAINING PROGRAM FOR SCINTILLA EDUCATORS

A description follows of the application of the evaluation model to the training program created for EFP trainers by the SCINTILLA project (Trentin et al., 2014).

1. Users' reaction to/appreciation of the basic training course

The measurements for the first level were made at the end of the basic training course (formal stage). Table I shows the indicators for the evaluation related to Level I and the methods used for their measurement.

Table I – Indicators and methods of measurement for Level I (Reaction).

Reaction	
Methods of measurement	Discussion during final course session
Indicators	1. Correspondence between expected topics and those actually proposed 2. Perceived usefulness of the exercises and appropriateness for trainers' professional activity 3. Perceived operational usefulness of technologies proposed as tools for professional activity 4. Perceived quality and usefulness of didactic material prepared specially for the course

2. Learning the online course contents

Assessment of the understanding of the educational contents (planning and management of online courses; web technologies and resources; features of SW and organizational methods) was spread over the whole

period of the basic course (formal stage). It was partly continued during the practical application of the knowledge acquired to the first experience of online management of professional training activities (a non-formal stage, since it was supported in backstage and sometimes redirected by ITD-CNR staff). For the skills related to online training, the assessment:

- in the formal stage, measured the ability to apply an ID methodology to the planning of an online training activity;
- in the non-formal stage, was extended to newly-trained subjects' ability to act as online tutors for their students.

On the other hand, for SW-related skills, assessment of learning was based mainly on observation of the course participants' argumentative skills during the role-play simulating the interaction between the trainer and the company representative. Table II shows the indicators for evaluation at Level II and the methods used for their measurement.

Table II. Indicators and methods of measurement related to Level II (Learning).

Learning	
Methods of measurement	Analysis of the results of students' course activities
a) Indicators related to learning of ID approaches	1. Pertinence of plans for online training activities handed in by participants to the ID models proposed in the course
b) Indicators related to use of web technologies and resources	2. Correspondence of Moodle learning spaces structured by participants with the indications in the scripts for the online activities 3. Correspondence between the documents created with Google Drive and PBWorks with the specific requirements of the exercises 4. Level of correctness of the exercises centered on videoconferencing tools
c) Indicators related to ability to mediate with the company	5. Level of coherence of the elements examined during a role-play simulating a case of work inclusion through smart working, i.e.: • context mapping (disabled subject to be included, company situation etc.); • professional (and SW) solution; • work task can be undertaken in SW mode; • methods of accompaniment to SW and of interaction with the company; • technological setting of tele-work station. 6. Appropriateness of the parts contributed by the single participants for a "Ten-point plan for the promotion of SW in organizations", required as a final output for one of the course activities

3. Skill in applying what has been learnt in the online course

This is the level in which the educators' ability to put their knowledge into practice was assessed. In fact they did not act here wholly independently (this is why it is defined as non-formal learning), in the sense that

an ITD-CNR tutor/expert followed them and sometimes guided them backstage during their first experiences, both as managers of their disabled students' online training and as direct interlocutors with the company into which these students were to be inserted. The evaluation established for this level was extended into the initial stage of interaction with the company, which aimed both at creating the best conditions for young homebound subjects' work inclusion in SW mode, and at defining the tasks they were to undertake.

Table III shows the indicators for the evaluation of Level III, together with the methods used for measuring them.

Table III. Indicators and measurement methods for Level III (Behavior).

Behavior	
Methods of measurement	Observation of the trainer's operating methods in a real case, during (a) planning and application of an online training activity and (b) accompaniment of the individual candidate in their work inclusion
a) Indicators related to the application of ID approaches and online tutor functions to a real case	1. Application of the approach to planning online training activities learnt during the course 2. Preparation of the scripts of the online activities according to the scheme proposed in the course 3. Choosing the most adequate technological tools for the planned online activities 4. Conduction of online tutoring, i.e. carrying out/support of planned online activities
b) Indicators related to mediation/coordination with the company	5. Analysis of context and actors 6. Suitability of chosen task for the disabled subject 7. SW solution suitable for the candidate 8. Strategies of communication among company, candidate and trainer

4. Effects of the training program on the organization (EFP, company)

As specified earlier, in our case "organization" is used to indicate both the institution to which the trainers belong (the EFP) and the companies/firms with which it is in contact for the purposes of work inclusion of a young disabled subject.

The real effects on the organization should in fact be evaluated only when the inclusion process is in the stabilization stage.

In the case of SCINTILLA, it is the moment at which the trainers begin to act independently (i.e. without the assistance of the institution which has trained them - in our case the ITD-CNR), both in training their students online and in negotiating their possible inclusion with the company in SW mode.

It is the stage where the trainers' learning continues to develop mainly in the informal dimension, i.e. learning-by-doing, and incidental knowledge acquisition during the periodical search for new solutions in (a)

planning and carrying out online training courses, and (b) building bridges between their students and the companies willing to employ them.

Although the real effects are evaluable only over the medium/long period (Rogers, 1995), some form of impact on the organization can actually be observed even in the short term (stage α of Figure 2).

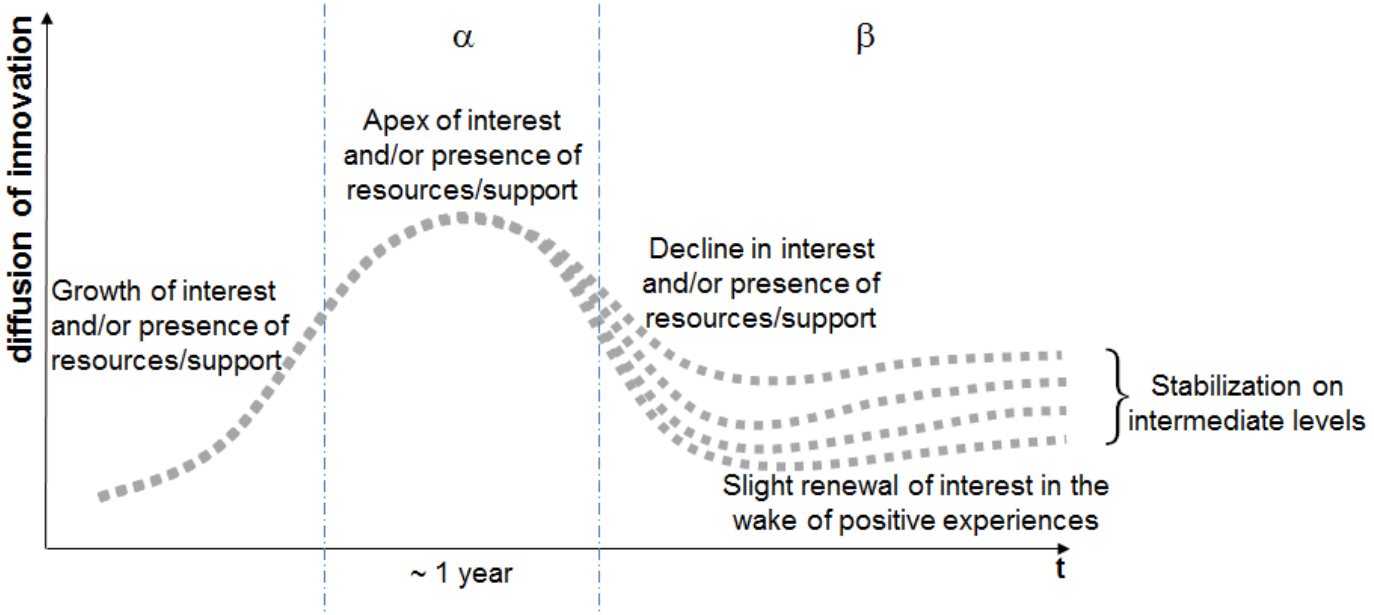

Figure 2. Diffusion of the innovation and impact on the organization.

This is the stage in which the long wave of interest produced by the previous (formal and non-formal) stages of the training program, including the scaffolding provided by the institution which has been responsible for the overall training program, can still be perceived. The result is that in phase α significant signals can already be registered in terms of:

- effects within the EFP, e.g. extension of the application of what has been learnt to the planning and creation of other courses (blended or wholly online) not necessarily targeted at disabled students;
- effects for the company/firm, e.g. acceleration of the inclusion of the disabled person in the production chain; better use of online communication to maintain contacts between the company and the worker during the activities in SW mode; extension of the SW approach to management of the work of the rest of the staff.

However, if we wish to talk about measurement of the real/stable impact, this must necessarily be carried out in the medium/long term (stage β), i.e. when objective considerations about how stably rooted the effects

of the training have become inside the organization (in direct, indirect and unexpected terms) can be made, at a sufficiently distant time from the training course. The extent of the rooting is represented in Figure 2 by an upward or downward trend in the right part of the curve (stabilization on intermediate levels). Table IV shows the reference indicators for Level IV evaluation, together with the methods used for their measurement. These indicators can be used for both the stages (α,β) associated with the "result" level.

Table IV. Indicators and measurement methods for Level IV (Result).

Result	
Methods of measurement	Measurement by means of informal talk and asynchronous interview
a) Indicators related to impact on EFP	1. Application of the methods and tools of the basic training course to similar cases (training and work inclusion of seriously disabled subjects) 2. Extension of the application of the methods and tools studied in the basic training course to the creation of new courses (blended or wholly distance), not necessarily targeted at disadvantaged users 3. Use by the EFP of SW approaches in internal work organization (integration of ICT into internal communication processes, use of clouding for collaborative work, remodulation of work)
b) Indicators related to impact on company/firm	4. Reduction of times for inclusion of disabled worker 5. Improvement in the use of online communication to maintain contact between company and worker during activities in SW mode 6. Use of SW for insertion of other disadvantaged cases 7. Extension of SW approach to other cases not necessarily linked to a disadvantaged situation and more orientated towards the internal organization of work and its optimization (integration of ICT into internal communication processes, use of clouding for collaborative work, remodulation of work) 8. Consideration of Smart Work potential in company's future planning
c) Indicators related to indirect effects of the training course	9. Request for lectures about inclusion and/or SW in conferences and workshops 10. Presence of institutional competitions for distance working, inspired by the experimentation carried out in SCINTILLA 11. Attention to SW potential and online training by institutional and non-institutional organizations belonging to the work inclusion network for disadvantaged subjects

CONCLUSIONS

It is extremely important to have the certainty that what has been observed in terms of positive modifications in institutional/organizational practice can really be ascribed to a specific training program. This is in fact the necessary condition for proceeding to estimation of the corresponding ROI (Phillips, 1998).

This means that to estimate ROI, we must first evaluate how the knowledge and skills acquired in the training course (Level II) are applied in the workplace (Level III), resulting in a positive impact on the participant's organization (Level IV). Unless these measurements are carried out, it is extremely difficult to

claim that the results really are the fruit of the training course in question, and that they can actually be taken into account for the tangible or intangible ROI calculation.

Defining and evaluating the benefits of any training program is a difficult task, especially in the educational context.

In evaluating what type of impact a training course has had on educators (e.g. school teachers, EFP trainers etc.), it is necessary to see its impact on the didactic practices of the educators' mother institution and understand how these practices have in their turn led to improvements in students' learning, etc.

The result is that in evaluating a training course for educators, almost always only the first and second levels of Kirkpatrick's model are taken into consideration, much more rarely the third.

In this article we have tried instead to propose an evaluation model for the training of trainers which covers all four of Kirkpatrick's levels, using the intangible returns of investment as the key of interpretation for the fourth one. Although these returns are not economically quantifiable, they are retained in fact to be essential for a qualitative evaluation of a training program for trainers, from both the pedagogical and the organizational points of view.

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