
ECOMPETENCE PROFILES: AN INSTRUMENT FOR ECOMPETENCE MANAGEMENT

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Introduction

Innovation, and more specifically, the use of ICT in educational innovation, is a challenge to the traditional working culture in higher education. The use of ICT in higher education is not simply a matter of encouraging teachers to adopt new tools and new techniques. The use of educational technology changes ways of working – both at the individual and the team level. In fact, the whole organisation is involved. Commitment, sharing of knowledge and insights and augmentation of eCompetences are crucial factors to realise the innovative goals of the organisation. This chapter presents the results of two projects funded by the *Dutch Digital University (DU)* as part of the so-called *Expertise Programme*. This programme aims at clustering, developing and disseminating the knowledge and expertise on educational innovation using ICT. A central theme in the programme is the professionalisation of teachers and educational managers in the field of *educational innovation using ICT*.

In the first stage of the project, profiles were developed for four different job categories of staff members in institutions of higher education. The follow-up project defined characteristics of the organisational context that influence the success of innovations. Ultimately, a website was built to support eCompetence management when planning an educational innovation using ICT.

1. eCompetence profiles

In the first project, entitled *eCompetence Profiles*, competence profiles were developed for four job categories of staff members involved in educational innovation using ICT: teachers, educationalists, developers of digital materials and educational managers.

Competence is defined as “the ability to act within a given context in a responsible and adequate way, while integrating complex knowledge, skills and attitudes” (Van der Blij, 2002). In this project, special attention was paid to the elements *knowledge* and *skills*. Furthermore, the concept of “ICT skills” was interpreted in a broad sense, including not only technical aspects, but also the educational competences necessary to judge and effectively integrate ICT in education.

On the basis of a literature search the tasks, responsibilities and activities concerning ICT based educational innovation of the four staff groups were listed. These preliminary competence profiles were then discussed with representatives of the staff groups. Subsequently, the project managers of the training programmes of institutions of the DU were asked to judge if the competence profiles were usable as part of the programme for the professional development of staff members. As a result of the comments received, the preliminary competence profiles were adapted. For each group a competence profile was constructed containing the following items: tasks and responsibilities, general basic professionalism, basic professionalism related to ICT and technical knowledge and skills.

The basic principle of the competence profile for each job group was the educational activity. ICT skills are of importance only as far as they *enhance the educational competences*. This means being able to use ICT in performing educational activities, being able to judge the use of ICT and being able to estimate the effects of the use of ICT on the design of instruction. In this way three disciplines are combined: the science of teaching, information technology and organisation theory.

In this project it was decided as a first step to make an analytical description of the competence profiles of the four job categories. This means that aspects of the context (organisation, group) were not examined, the project focused on the core of the job under consideration. In the interviews with representatives of the groups it became clear that the context in which the professional works determines the specific competences needed and the demand for professional development. In order to be successful, professional development must consider the context in which it takes place.

2. Professionalisation tailored to the organisation

The study revealed, then, that ICT-based educational innovation must be viewed within the organisational context. In practice, however, it is often the case that competence analysis pays little attention to the implications of this interdependency, the result being that inventories and instruments for competences are used mainly on an individual level. But if one intends to use analysis and improvement of competences to realise organisational goals it is necessary to view the demands for competences and professionalisation of different actors in connection with each other and within the working context.

Therefore, a second project was defined, entitled ‘Professionalisation Tailored to the Organisation,’ which examined the important contextual characteristics for such innovation. This included a focus on the general characteristics of the organisation as well as the characteristics and eCompetences of the group initiated via a comprehensive literature review in the field of organisational strategic, innovation and implementation.

2.1 Competences on the organisational level

As far as eCompetences on the organisational level refer to *human capital*, they are the sum of the individual competences, the knowledge, skills and attitudes of individuals. These competences are described in some detail later.

At least as important are the *innovative competences* that characterise the organisation. We could define them as “condition creating competences”: those competences that determine the context for innovation. These characteristics are considered as quite established features which are not easy to change (develop). They determine if organisations are able to cope with changes, if they manage to realise the adaptations and transformations necessary to attain the goals of the organisation (e.g. successful innovation using ICT).

Factors that determine the context for professional development in the organisation are the way learning takes place in the organisation, the importance attached to it, the ease with which people learn from each other and the importance attached to tacit knowledge.

Sprenger *et al* (in Buskermolen, 2000) distinguishes four competences of the *learning organisation*:

- a. Absorptive power (the capacity to incorporate new knowledge in the organisation)
- b. Diffusion capacity (the capacity to disseminate knowledge within the organisation)
- c. Generative power (the capacity to develop new knowledge within the organisation)
- d. Exploitation capacity (the capacity to use the knowledge present in the organisation)

In the phases of *absorption* and *generation*, teams and individual staff members increase the total amount of knowledge within the organisation, for example, in development projects. In the *diffusion* phase, staff members who possess certain knowledge transmit that knowledge to those who need it. In the *exploitation* phase, existing knowledge is made productive (Bertrams, 1999).

The four competences together could be defined in terms of organisational culture (norms, values, support and willingness to change). This means that *attitude* is part and parcel of the abilities of an organisation to change.

Argote *et al* (2003) claim that the characteristics of the knowledge are important for learning in organisations. Examples are differences between explicit and tacit knowledge, knowledge developed inside or outside the organisation and soft or hard knowledge. The extent to which knowledge is tacit, for example, partly determines the way it is disseminated. But also characteristics of departments and teams, and characteristics of the relations between departments and teams, effect the way in, and degree to which, knowledge is incorporated.

A criticism of the first attempt to define eCompetence profiles was the omission of consideration of “attitude.” This, however, was explicitly incorporated into the second project and was included in the competences needed for ICT based educational innovation. Without the required aspects of attitude, knowledge and skills cannot lead to the desired results.

In addition to the competences already mentioned, other factors such as the technical infrastructure, the resources and the procedures are of importance. In the ultimate formulation of the characteristics of the organisation, the success factors for innovation identified by Rogers (1995) and Ruijter (2003) and aspects of the implementation theory of Fullan (2001) were utilised. Professional development can only be successful if aspects of the context such as the expertise present in the organisation, the commitment of the management, the organisational culture, the infrastructure, the system of rewards and the resources are all considered.

Table 1 presents a summary of the general organisational characteristics required for successful innovation as identified from the literature review.

<i>Innovation process and expertise</i>
The intended innovation policy of the organisation is clear
The nature of the innovation the organisation advocates is clear
Within the organisation there is consensus of opinion about the (innovation) policy
In the organisation educational innovation is centrally managed
The consequences of the innovation policy of the organisation for the department are clear
Within the organisation you as a manager are supported when developing a competence policy
Within the organisation there is expertise concerning innovation processes and ICT
Within the organisation you can make use of the expertise of other staff members
<i>Organisational culture and prior conditions</i>
The communication within the organisation is good
The organisation rewards willingness to change
The organisation stimulates constructive collaboration between and within departments
The organisation is considered to be a forerunner in innovation
Creativity and flexibility are valued in the organisation
Agreements are always fulfilled in the organisation
The organisation has a good technical infrastructure
The organisation has sufficient resources for educational innovation

Table 1: General characteristics of the organisation

2.2 eCompetences on the individual level

The project also considered innovation and eCompetences for individual staff members as determined during the earlier work on staff group profiles. As stated before, these competences include not only technical aspects, but also the educational competences necessary to judge and effectively integrate ICT in education. In contrast to the organisational competences, these competences can be developed. The corresponding list of competences is given in table 2.

<i>(Instructional) Design</i>
Didactic design of electronic educational materials
Developing competence based instruction
Applying instructional models
Designing educational websites
Formulating and applying educational technological requirements
Designing digital portfolios
Designing competence based assessments
Making digital study materials
Building electronic learning environments
Designing electronic tests/assessment
Judging the didactic merits of evaluation methods
<i>Perform the instructional process</i>
Electronic tutoring of groups of students
Electronic tutoring of individual students
Tutoring of the individual learning process
Tutoring students in building up portfolios
Assessing portfolios
Electronic testing
Electronic assessment
Tutoring students in using digital educational materials
<i>Communication</i>
Emailing
Chatting
Creating discussion groups
Setting up and performing video and desktop conferencing
Communication with staff members
<i>(Design) tools</i>
Basic ICT-skills (Internet, Word, PowerPoint)
Using standard applications (HTML, Java, Authorware, Frontpage etc.)
Using programming languages
Using Photoshop, video software, etc.
Making graphic designs
<i>Other functionalities</i>
Using groupware
Using multi and telemedia
Using simulations, intelligent agents, intelligent tutoring systems

Using expert systems
Using statistical programmes
Using programmes for planning and managing projects
<i>Acquire information</i>
Searching for and referring to information on the world wide web (Internet, online resources)
Making and using electronic databases
Using library search systems
<i>Administration and organisation</i>
Using student and course administration systems
Using student tracking systems
Setting up and performing electronic evaluation
<i>Other topics</i>
Indicating advantages and disadvantages of different tools
Indicating the compatibility between products
Formulating technological requirements
Having insight into the relation between ICT and the learning process
Having insight into various (im)possibilities of ICT in education on the level of organisation, curriculum, course and lesson
Working according to plan
Giving oral presentations
Reporting in writing
Project management
Giving advice on implementation

Table 2: List of eCompetences

2.3 eCompetences on the group level

In the previous paragraphs, competences on the organisational and individual levels were described. Organisational competences were defined as “condition creating competences”: those competences that determine the context for innovation. These competences or characteristics are considered as quite established features which are difficult to develop. The individual competences are competences that can be developed by the individual.

In addition, there are also competences on the group level. These are derived from the organisational and the individual competences. The group competences are competences which can be developed by the group as a whole.

A group in an organisation can be defined as “one in which members share common organisation positions, participate in equivalent work experiences and, as a consequence, have consonant world views” (Nkomo and Cox , 1996).

The competences on the group level give insight into the level of innovation of the group. They comprise:

- a. the knowledge and skills that relate to educational innovation using ICT (equal to the individual eCompetences)

- b. the competences in terms of the attitudes within a group. Examples are the willingness to share knowledge, the belief in new developments, the flexibility to cope with change, the capacity to learn and change. These innovative competences are derived from the organisational competences and are listed in the table below.

<i>Innovative competences</i>
The group is open to the proposed innovation
The group knows the reason for the innovation
The group has the knowledge and skills required to achieve the desired goal
The group employs ICT as part of and tool in education and educational innovation
The group can point out problems in time
The group tackles problems in a systematic way
The group can work independently within the indicated framework of tasks
The staff members can call others to account for their powers and responsibilities
The group can anticipate questions of target groups in a flexible way
The group is results-oriented
The group is able to solve potential differences of opinion inside the group
The group easily expresses appreciation of each other
The group knows where to find knowledge
The group takes care of communication inside and outside the group

Table 3: Innovative competences of the group

3. eCompetence management

After the competences on organisational, individual and group levels were identified, a web-based diagnostic instrument containing those competences was developed. The first trial version of the instrument was paper-based. This version was presented to potential users whose comments led to several alterations. Then a prototype was built and tested by a limited number of potential users.

The purpose of this instrument is to support managers in education and human resources when specifying competence management and formulating a policy of staff training. Competence management is defined as directing on competences to reach organisational goals. Competence management is essential for a successful implementation of educational innovation.

The instrument supports managers in educational institutions to develop a systematic vision of the demands and measures for professionalisation in their organisation. It concerns professional development directed at raising the eCompetence level of several kinds of staff members involved in educational innovation using ICT, especially teachers and educationalists. The instrument gives insight into the eCompetences available and those required. Examples of such innovations might include: introducing an electronic learning environment, a digital portfolio or a student tracking system.

Often only individual competences are taken into account, but (educational) innovation is always shaped at a group level (within teams, departments or faculties). A distinctive feature of this instrument is that it can be used for listing eCompetences not only of individual staff members but also of groups. The website enables the user to determine if a team or individual staff members in an institution of higher education have the eCompetences needed to successfully implement the educational innovation.

When a manager or team leader uses the instrument to develop the eCompetences of a department or a team, the results are a team development plan and a team activity plan. The website can also be used by a staff member for his or her eCompetence development as part of the proposed innovation. In that

case, the results are a personal development plan and a personal activity plan. Staff members can be authorised to view each other's activity plans for 360 degree feedback.

Often it is presumed that reducing the gap between the competences available and those that are needed will facilitate the innovation. However, each innovation takes place within a situation posing opportunities and threats. Therefore, the instrument provides the tools to describe the (organisational) context of the innovation, in order to be able to take account of the opportunities and threats present when formulating an innovation policy. Knowledge of these threats enables a manager to act on them, thus increasing the chances of success.

3.1 Details of the instrument

The instrument contains the following elements:

1. *Context*: checklists of general context characteristics (inside and outside the organisation) and group characteristics, both in terms of opportunities and threats. The purpose is to identify opportunities that can be used and threats that must be reduced.

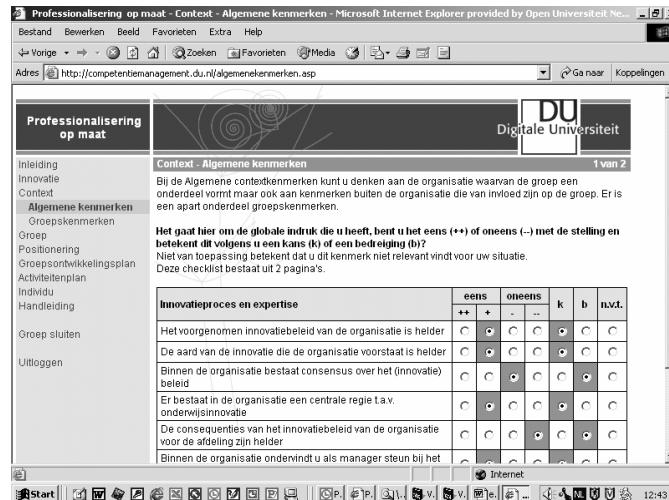


Figure 1: A screenshot of the easy-to-use interface used by the web-tool to identify competences. In this case it is for the general characteristics of the organisation. Similar pages are used for individual and group competence identification.

2. *Competences*: checklists of innovative and eCompetences on the group level and on the individual level. The group competences are those which can be developed by the group as a whole; the individual competences are those which can be developed by the individual. The group competences are based partly on individual competences (e.g. knowledge and skills for educational innovation using ICT) and partly derived from organisational context features (e.g. team capacity for learning and change in organisational context).
3. *Positioning and conclusions*: reflection on the choices made and prioritising the urgency of reducing the threats and developing the missing competences.
4. *Group development plan*: on the basis of the decisions made in *positioning and conclusions* the manager formulates activities which must be undertaken to develop the competences of the group and to reduce the threats.

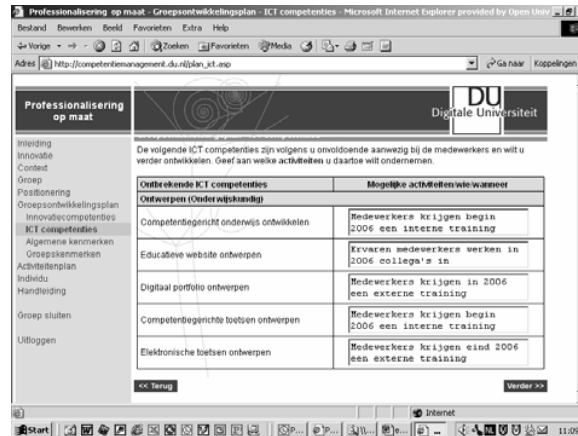


Figure 2: Group development plan

5. *Group activity plan*: survey of the measures the manager wants to take.
6. *Personal development plan*: on the basis of his or her scores in the element competences, the individual determines which actions he or she wants to take: deploy available competences, develop missing competences, prioritise actions and set deadlines.

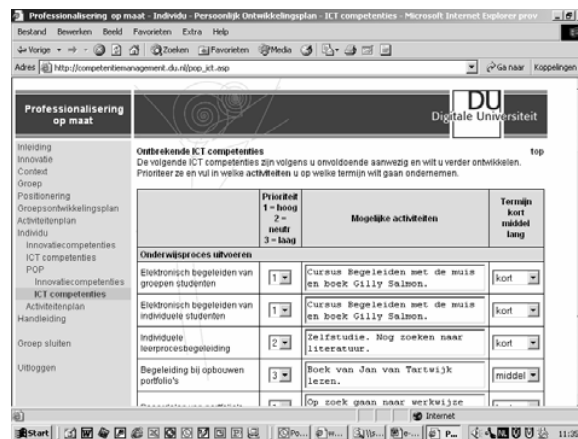


Figure 3: Personal development plan

7. *Personal activity plan*: survey of the measures the individual wants to take.
8. *Manual and directions for use*: information about the instrument, tips for using the instrument, hints and references about policies and measures for staff training.

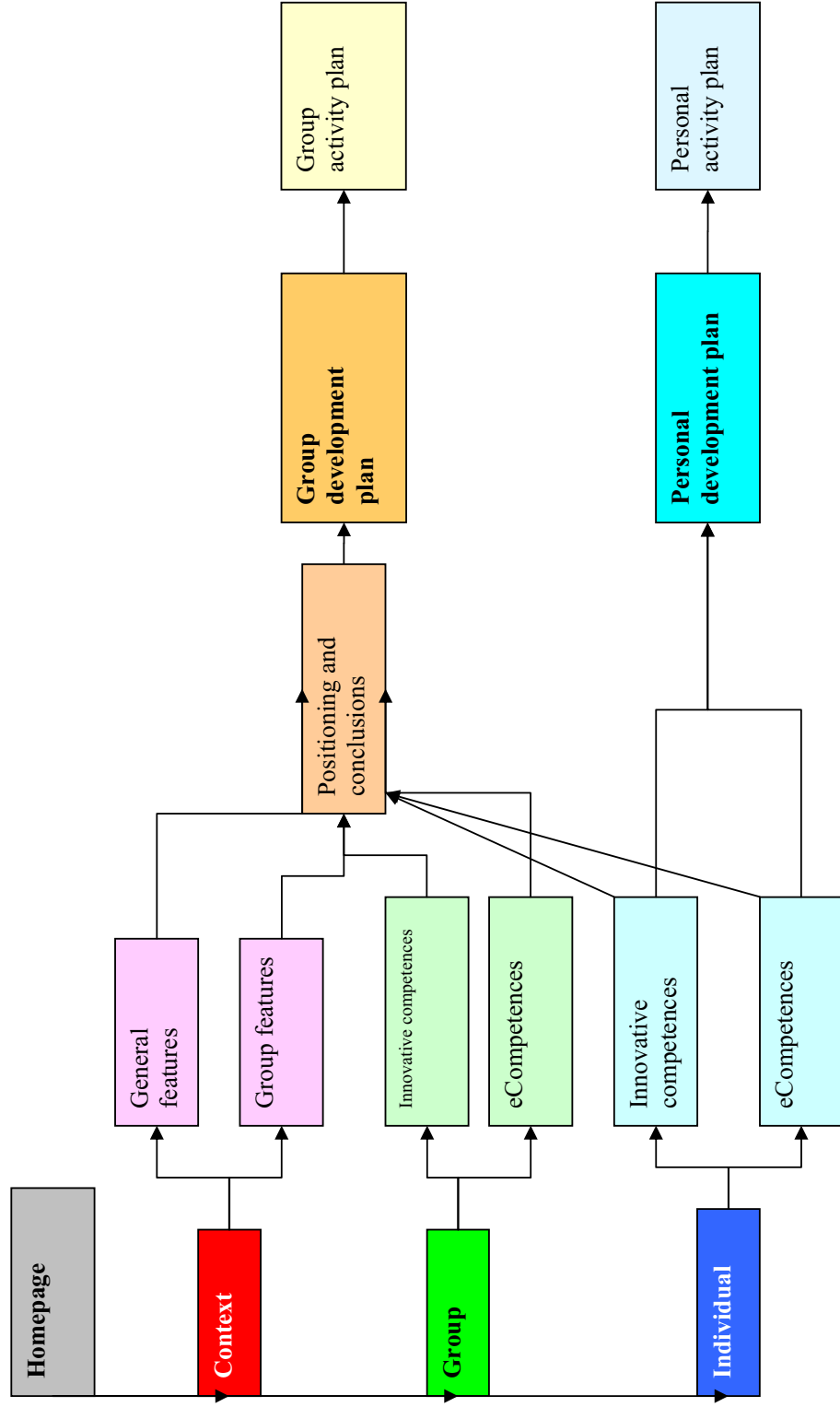


Figure 4: Flow chart of the instrument

3.2 *Applications of the instrument*

The instrument can be used for the following purposes:

- formulating a policy for eCompetence management for a group, in the light of the proposed innovation, resulting in a group development plan;
- communication about and clarification of visions and interpretations regarding the proposed innovation and the relevant context and group characteristics; resulting in a shared vision on the innovation, the required eCompetences and the opportunities and threats;
- gain an insight into individual eCompetences related to group eCompetences, in the light of the proposed innovation, resulting in a personal development plan.

4. Conclusion

The project on *professionalisation tailored to the organisation* focused on the significance of professional development, not only at the individual level, but also at the organisational and the team levels. It stressed the necessity for an organisation to formulate an explicit professionalisation policy, thereby taking into account the specific context of the organisation. The project shows that it is fruitful to combine both levels (group and individual), related to the context. Describing the innovation and its targets at an early stage provides a clear view of the eCompetences needed within the context. A policy can then be formulated to achieve the required results. The instrument developed provides insight into both innovation and the eCompetences needed for an educational innovation. This makes it possible to see the eCompetences in connection with the innovation competences and vice versa.

Access to the instrument can be obtained by contacting the helpdesk of the Digital University of the Netherlands. Questions and remarks concerning the content and the use of the instrument are discussed in a *Community of Practice* on management of ICT and education and workshops are organised on request.

In the workshops held to date, participants have agreed that the instrument is useful for them as a manager or staff member in an institution of higher education. It helps them to gain insight into available and missing eCompetences. The following improvements have been suggested: shorter and more cohesive checklists, the possibility to add competences specific to their own situation and more support in formulating an activity plan. Future developments (dependent, of course, on continued funding for the project) will be based on feedback from users and their experiences of using the instrument in practice.

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Websites:

De Digitale Universiteit [The Dutch Digital University], <http://www.du.nl/>

Professionalisering op maat van de organisatie [*Professionalisation tailored to the organisation*]

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