The Assessment of Competence in University Adult Education: A Dynamic Approach

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The present paper aims to explore the field of adult education and competence development in university settings. An ICT-based tool was used to assess three successive target groups of professionals considered adult students. Our results have a research and practical series of implications. Individuals gain self-knowledge and perception in terms of present and future competences; furthermore, the process of self-analysis could be initiated. Group level results are important for teachers and educators helping them towards a student-centred teaching/learning initiative, putting emphasis on the issue and managing diversity. Educational management can improve the quality of teaching and design a competitive path through differentiation.

Keywords: competence; competence assessment; competence development; change; educational leadership; adult education; learning

Introduction

Presently there is a rich knowledge base on nations', regions' and firms' competitive advantage. Moving towards a more micro level approach, it is interesting to tackle the issues of individuals. Competences can be thought of as the competitive advantage that human beings have. Their existence and levels of achievement can have an impact on performance. Traditional business environments have placed special emphasis on competences, resulting in a relatively rich source of knowledge in terms of models, levels of achievement, measurement tools and methods, certification systems, and other aspects. A great deal of discussion occurs around the topic of educational environments, internationally at all levels of teaching/learning. The debate is whether and up to what degree graduates should demonstrate being competent at the end of their learning path, often synonymous with the beginning of a professional career. It is in this framework where competences turn into a possible outcome, a complement of the traditional

knowledge teaching educational system. Most often competences, rather than knowledge, represent an asset highly appreciated by future employers.

Although education has always played a key role in human development, the competence-based educational model was stated explicitly in Europe only after the Bologna Process began. It may have been in use in the UK and outside Europe; however, their importance has been made explicit with the emergence of the unique European Higher Education Area. Because universities are structurally and organizationally complex, due to their hierarchical nature, relative size and the coexistence of multiple structures, they characteristically develop at a slower pace than businesses. Therefore, both decision making and implementation follow a less accelerated rhythm.

On the other hand, university activities are not confined to adolescents and young people, but should extend to adults of all ages who are starting or changing their careers, returning to study or continuing an unfinished career. Adult or mature students represent a special target group for analysis from an educational, social, and professional perspective.

Adult education is often used as an umbrella term and can be defined as the practice of teaching and educating adults. In practice it is associated with training and development, often referred to as professional or workforce development. It can be distinguished from vocational education (classically adult education or adult learning), which is mostly workplace-based for skill improvement, and also from non-formal adult education, which includes learning skills or learning for personal development. The Commission of the European Communities (2006), in its communication entitled 'Adult learning: It is never too late to learn,' defines adult education as follows: 'All forms of learning undertaken by adults after having left initial education and training, however far this process may have gone (e.g., including tertiary education).' A broader definition of the concept can be found in a document that is intended to provide the European terminology for adult learning in order to facilitate common understanding and monitoring of the sector, namely, 'The entire range of formal, non-formal and informal learning activities which are undertaken by adults after a break since leaving initial education and training, and which results in the acquisition of new knowledge and skills' (National Research and Development Centre, 2010, 6).

The present paper has the aim of exploring an emerging trend in the field of human resource management, namely competency modelling and assessment, focusing on adult students who have an initial university career and considerable professional experience. The paper examines empirical evidence in this rather unexplored field. A dynamic perspective is applied, since competences are subject to change, as well as distinguishing the different student groups attending university education.

In order to fulfil this objective the following research questions have been formulated:

RQ1 *What are the different strengths and weaknesses that adult students perceive in their competences?*

RQ2 *What is their vision and attitude towards change relative to competences, in general?*

The paper is structured in six main sections. After the Introduction, we present the relevant literature about adult education and competences. These are the two main pillars of present study, which is intended to fill the research gap detected in previous studies. In Section 3, we describe the methodology used. The results are presented and discussed in Section 4. Section 5 presents the main implications for research and practice, while Section 6 concludes.

Institutional Framework and Literature Review

As regarded in the Triple-Helix innovation model, all actors – government, academia and business – are important contributors, having often differentiated structure and functioning, while still cooperating towards a common goal. To summarize, policy-makers create the adequate institutional framework and policy measures, academia generates and transfers knowledge, while practitioners convert knowledge into real innovations.

In this section, we describe the two main pillars of our work; adult education, on the one hand, and competences and resulting competence models, on the other hand. Adult education is described from an institutional perspective, while competences and competence models are described using previous relevant work in the field.

The Institutional Perspective: Adult Education

The importance of training and education has always been recognized. They are considered critical contributors to economic competitiveness, growth, as well as social inclusion, among others. Discussion on adults as a special community seem to have started at the beginning of the twentieth century, for an example see the American Library Association study on Libraries and Adult Education published early in 1926 (American Library Association, 1926). Another important era started in the 1990s, when, with the proliferation of computer and the Internet, adults rolled in specific courses in order to gain knowledge that would further help them toward promotion or would give access to a better job.

As understood in the present study and following current trends, such as adults expanding and complementing their initial studies/degrees, it is

relatively recently – in the last decade – that important international actors (EU, OECD, UNESCO) have recognized the importance of life-long learning, creating specific communications, reports, research, organizations, programmes, and action plans for its promotion. However, universities, as adult education providers, have contributed relatively little in practice.

In the following we describe some institutional documents that relate to this topic.

A recent study organized under the framework of the 2007 Action Plan on Adult Learning, (National Research and Development Centre, 2010) identifies the main fields of analysis in the adult learning sector. The main dimensions refer to adult learning strategy, policy and legislation, adult skills and competences, access to and participation in adult learning, investment in adult learning, quality of adult learning, and outcomes of adult learning. The particular dimensions of *adult skills and competences* include: digital competences, learning-to-learn, skills for active citizenship and learner persistence, as the main fields of analysis, while the sub-fields of analysis are problem-solving in technology rich environments, literacy, reading, numeracy, and work-related skills.

Although competences are established as the main dimension of adult education and learning, the report on adult education trends and issues in Europe (European Association for the Education of Adults, 2006), under the chapter titled issues and actions to take adult learning and adult education forward in Europe, describes the following: quality and development in adult education, recognising and validating other forms of learning, basic skills and *key competencies* – emerging issues, active citizenship and adult learning, local learning centres, partnerships and decentralisation, the research base for adult education and learning, the training and development of adult education personnel. It is interesting to observe that the competence issue is labelled as an emerging issue.

Conceptually, adult education is a broad topic and different documents, both institutional and research-oriented, deal with the concept definition, delimitation, and characteristics. The report by Powell, Smith, and Reakes (2003) aims towards *defining common issues across Europe for adult education* and it provides a historical approach to the term, as well as valuable comments regarding definition, concepts, and a country-specific approach regarding the term for a limited number of countries. It is interesting to reproduce the phrase 'there is a common understanding of adult education, but not a common definition.'

Another recent study on the role of higher education institutions as providers of continuous professional learning and adult education (Directorate-General for Education and Culture, 2011) discusses the *stereotype of the adult student.* The report states that the standard vision of adult learn-

Table 1   Characteristic of Adult Students: Pragmatic Evidences

Characteristic	Adult student	Young student
Age	>25	<25
Motive to access education	Gain complementary knowledge/degree	Gain initial knowledge/degree
Short term objective	Increase the knowledge base	Pass final exam
Motivation to study	Higher	Varied
Capacity towards content understanding	Higher	Lower
Capacity to memorize	Lower	Higher
Capacity to interconnect knowledge areas	Higher	Lower
Study routine	Lower	Higher
Professional experience	Higher	None or lower
Availability for class attendance	Lower	Higher
Contribution to class discussion	Higher	Lower
Main barriers to learning	Lack of time; Professional life, personal life and study balance	High distraction Lack of achievement orientation
Competence levels	Higher	Lower
Study performance	Equal or higher	Equal or lower

ers has been based on the unfounded stereotype that adults are less effective learners simply because they are adults (Kasworm, 1990). This has often been linked to the loss of memory and the lack of the necessary flexibility to adopt new perspectives. However, this stereotype has largely been refuted by research.

Regarding both teaching and learning, adult students are valuable from a variety of perspectives, as they can bring valuable input to class discussion, they make sense of new information and new situations, and their results are no worse than those of younger students. Interestingly, one problem is that, even if adults are not less effective learners, they may believe they are and act upon these shared stereotypes; consequently, this may push them away from higher education. Therefore, one important aspect is *motivation* (Aramo-Immonen et al., 2011).

Adult students have received a great deal of attention in the field of psychology and much less in management. According to the authors' experience and the findings of few studies detected in this particular field, we generate a profile of the adult student. The contrast is even more interesting when we compare this group to regular young students (see Table 1).

The Employment and Training Administration (2007) report describes adult learners in Higher Education and makes considerable efforts to identify *barriers to success* and strategies to improve the results. Although spe-

cific to the US, the general message is valid for all countries and is formulated according to the following key aspects:

- *accessibility:* greater flexibility and more accelerated learning options are needed for adult learners,
- *affordability:* new strategies of student aid and institutional financing are necessary to support the needs of adult learners,
- *accountability:* efforts to monitor quality and drive improved outcomes must incorporate measures of adult learner success and finally
- *recommendations:* a plan for addressing adult learners' needs in higher education.

Another important aspect is *institutional commitment.* Universities and governments commit to promoting life-long learning and consequently adult education. This is formalized in the document published by the European Association of Universities (2008), which states that universities commit to the following lines of actuation: embedding concepts of a widening access and lifelong learning in their institutional strategies, providing education and learning to a diversified student population, adapting study programmes to ensure that they are designed to widen the participation and attract returning adult learners, providing appropriate guidance and counselling services, recognising prior learning, embracing lifelong learning in quality culture, strengthening the relationship between research, teaching and innovation in the context of lifelong learning, consolidating reforms to promote a flexible and creative learning environment for all students, developing partnerships at local, regional, national and international level to provide attractive and relevant programmes, and acting as role models of lifelong learning institutions.

Still at university level, but considering the other side of the coin, the key issue is what kind of *professional is needed in adult education.* At institutional level, the research reported by Research voor Beleid (2010) defines a set of generic competencies, specific competences directly involved in the learning process and specific competencies supportive of the learning process, as well as potential ways of using them. Among the potential ways of making use of the set of key competences, we highlight the options of self-assessment and evaluation, selection of training courses, assessment of competences, and continuous professional development.

In summary, there is great institutional interest in the field of adult education and competencies appear to be an emerging trend. Although their importance is recognized, relatively little research has been conducted in the field, especially focusing on exploring the conjunction of university adult education and competence assessment. In the present paper, we aim to

target this specific field, keeping in mind the degree of complexity and challenging nature of our task.

Literature Review: Competences and Competence Models

In general, the term 'competences' refers to the traits, knowledge, skills, experience, and values that an individual needs to accomplish his or her tasks. Competences are also defined as behaviour models (Roberts, 1997), or as hidden characteristics of personality with an effect on performance at work (Spencer & Spencer, 1993). Based on these definitions, our rationale is that the assessment of competences is an important means of anticipating work-role performance, and thus, competence evaluation becomes an important instrument in several stages of human resource development.

The variety of definitions and approaches related to competence is no less than the variety of perspectives on adult education discussed above. Professional associations in the field, as well as research, deal constantly with this matter. Universities have only relatively recently turned their attention explicitly to competences as a way of preparing students for real professional settings. In their work, Draganidis and Mentzas (2006) make a review of systems and approaches for competency-based management. We complement their table of definitions (Table 2) in order to capture the existing variety.

Models of competence are a descriptive tool that identifies the competences needed to operate in a specific role within a job, occupation, organization, or industry. Simply stated, a competency model is a behavioural job description that must be defined for each occupational function and each job (Fogg, 1999). According to Shippman et al. (2000) 7 to 9 competences are necessary for a job, often varying according to work type, position, organizational environment or culture. Competences organized according to different criteria form competence models habitually mapping the constituting elements and the relationships established between them. For the specific example of the present research we use the Cycloid competence model for project management developed by Liikama (2006).

Although similar studies using exactly the same tool in adult education context have not been conducted, there are other publications describing the use of this Evolute platform tool in similar settings. These studies describe the cases of Tampere University of Technology at Pori in Finland (Kantola, Vanharanta, & Karwowski 2005; Kantola, Karwowski, & Vanharanta, 2011), Brunel University West London in the UK (Makatsoris, 2009), engineering students in South Korea (Chang, Kantola, & Vanharanta, 2007), university students in South Korea and Finland at three different universities (Chang et al., 2009), and the University of Girona in Spain (Bikfalvi et al., 2007).

Table 2   Competence Concept Definition Examples

Author	Definition
Wikipedia	The ability of an individual to do a job properly.
Boyatzis (1982)	Underlying characteristics of an individual, which are causally (change in one variable causes change in another) related to effective job performance.
Spencer and Spencer (1993)	A subjacent characteristic in a person that is causally related to performance, referred to superior criteria in a job or situation.
HR-XML	A specific, identifiable, definable, and measurable knowledge, skill, ability, and/or deployment-related characteristic (e.g. attitude, behaviour, physical activity), which a human resource may possess and which is necessary for, or material to, the performance of an activity within a specific business context.
Oracle	Knowledge, skills, abilities, and personal traits that an individual should have to be effective on the job.
International Project Management Association (2006)	A competence is a collection of knowledge, personal attitudes, skills, and relevant experience needed to be successful in a certain function.
DeSeCo (N. d.)	It is more than just knowledge and skills. It involves the ability to meet complex demands by drawing on and mobilizing psychosocial resources (including skills and attitudes) in a particular context.
University of Girona (2006)	A complex concept linking different kinds of knowledge that an individual acquires in different contexts, moments, and ways through his life, with different situations or problems the individual could front and resolve, which could have different complexity degrees.
American Job Center	The capability to apply or use a set of related knowledge, skills, and abilities required to successfully perform 'critical work functions' or tasks in a defined work setting.

Notes   Adapted from Draganidis and Mentzas (2006)

It is also interesting to consider the more specific human resource management perspective on competences. The *Human Resource Management Review* dedicated an edition in 2008 to critical issues in HRM theory and practice, and diversity management is one of the topics considered. Although diversity is often linked to age, gender, race, and background (Liakhovitski, Stone-Romero, & Jaccard, 2008; Dencker, Joshi, &, Marocchio, 2008) – characteristics that are difficult or impossible to change – in this paper, we focus on competence diversity, a field that is much easier to change.

From this section, it is clear that there does not seem to be a well-accepted unique definition of the term competence nor there is any generally accepted operational limitation for the term adult education.

Therefore, for the purpose of the present study a generic definition of competence will be used, namely *knowledge, skills and abilities as contributors in successful job performance.* Regarding adult education, we also opt

for a broad definition; adult education is thus understood as the *range of activities undertaken by adults to acquire new knowledge and skills.*

Methodology

The process of moving towards a European Higher Education Area is meant to offer the opportunity of high-level (superior) degree studies to those who start out studying for medium-level (technical) degrees. It is interesting to consider a special target group, adult professionals wishing to move from a medium degree (Technical Architecture) to a superior degree (Construction Engineering) by attending a 1-year additional pack of specific courses in order to attain the higher status and recognition of the latter degree.

The evaluation method utilized in this study was developed on the generic, Internet-based, computer application environment Evolute. The application involves the use of self-evaluation in assessment through an ICT-based tool adapted to the project management work role. In the application, statements describing various aspects of project manager competences are linguistic variables. Day-by-day situations described in the present (actual) and in the future (desired) capture the individual's vision through 120 statements. The gap between the actual and the desired states, often called *creative tension* or *intentional change,* shows possible fields of intervention and motivation to learn and develop further.

In practical terms, the study was conducted using three different groups of participants. Participants were asked to complete a self-evaluation and a post-evaluation questionnaire. Once all statements have been answered, the application provides an immediate result in the form of a graph or *competence map.* Participants have the option to consider the results at different levels of aggregation (30 competences, 6 groups of competences, or 2 main groups of competences), and a variety of graphs according to their current level of competences (blue bar), target level of competences (red bar), or creative tension, the gap between the present and future state.

The step-by-step description of the methodology used for the two groups is depicted in Figure 1, which also shows the typology and role of the main participants.

Participants were provided with a written guide describing the objective of the evaluation, the step-by-step process, and a sample interpretation of the resulting report of a competence map. The evaluations took place in a regular university PC room with assistance offered during the sessions.

Although this ICT-based tool, available through regular Internet connection, permits self-assessment conducted outside the university setting, we prefer a guided and assisted session, gathering participants and providing them with the necessary information and explanations. This ensures that the participants know and understand all the issues related to the exer-

Educator	Student	Administrator	Task
Step 1			Conduct self-evaluation
Step 2 ⟶		Step 2	Detect and send functioning and/or content error
Step 3 ⟶		Step 3	Prepare and send a list of participants
Step 4 ⟶	Step 4		Explain method and provide documentation
Step 5			Reserve PC rooms
	Step 6 ⟵	Step 6	Communicate the date and place of evaluation
		Step 7	Create ICT platform users
	Step 8		Conduct self-evaluation
	Step 9		Interpret individual results
Step 10			Show and comment aggregated group/class results
Step 11 ⟶	Step 11		Deliver post-evaluation questionnaire
Step 12 ⟶	Step 12		Deliver filled in post-evaluation questionnaire

Figure 1   Step-by-Step Methodology Applied in the Project by Roles and Tasks (adapted from Bikfalvi et al., 2007)

Table 3   Post-Evaluation Questionnaire Constructs' Cronbach Alpha Values

Constructs	Cronbach alpha	Cronbach alpha if item deleted
Professional experience, a contributor to competence development	0.745	0.751 (Social skills)
Education, a contributor to competence development	0.786	0.804 (Self-knowledge)
Need for change	0.678	0.702 (Self-knowledge)
Intention to change	0.781	0.828 (Self-knowledge)
Subjective validity of the tool	0.736	0.793 (Self-knowledge)

cise. Once the students had been fully informed about the process and the purpose of the study, they participated voluntarily in the experiment. No specific incentive was provided; howver, their curiosity to conduct self-evaluation providing immediate results in the form of a 'competence map picture' made students participate actively.

The framework for conducting the competence evaluation of adult students is called 'Development of organizational behaviour for health and safety.' A total of 202 subjects filled in the evaluation and afterwards 116 completed the post-evaluation questionnaire. Before data analysis and refinement, we conducted a reliability analysis (Table 3). The most widely used reliability coefficient is Cronbach's coefficient alpha with an acceptance level at least 0.7 (Nunnally & Bernstein, 1994). Coefficient alpha is estimated as an indication of how the sample of items performs in capturing the construct. In the majority of the considered constructs, the coefficient alpha values exceeded the conventional minimum demonstrating fair internal consistency and hence reliability of the scale used.

Table 4 Methodological Summary of the Research

Item	Year 2009/2010	Year 2010/2011	Year 2011/2012
Framework subject for conducting competence evaluation	Development of organizational behaviour for health and safety		
Present degree	Technical Architecture (3 years study)		
Future degree	Construction Engineer (4 years study)		
Target population	88	78	70
Valid competence evaluations	52	43	36
Response rate	59.1%	55,1%	51,4%
Valid post-evaluations	47	38	31
Self-evaluation	During December 2009	During October 2010	During October 2011

Those who stated that they had no experience in the field of project management were asked to consider their student career as a project that they were managing, and relate their responses to that. Table 4 is a summary of the methodological aspects of the study.

Results and Discussion

This section presents the results compiled in the framework of the study, and they are organized as follows. First, we describe the profile of respondents in order to gain insights on the characteristics of the analysed adult student group. Second, we present the results of the self-evaluation phase, which reflects competence levels grouped in perceived strengths and weaknesses. Third, we show outputs of the post-evaluation phase which collected opinions, intentions, and willingness to change.

Profile of Respondents

In total more than half of the students registered in the course completed the self-evaluation phase and more than 80% of those filled in the post-evaluation questionnaire. The main descriptive features of respondents are presented in Table 5. In general, we highlight the large proportion of adult students combining studies with full time work. Two thirds have more than 5 years of work experience. One third are women and their overall mean age is approximately 33 years. This characteristic is entirely in line with the general characteristic of the entire population (Technical Architecture graduates) where in all courses considered since its first edition academic course 1999/2000 male graduates exceed female ones in the proportion of two thirds. We believe that the sample obtained is an accurate representation of the population, except for their higher motivation and commitment to all types of exercises and activities, as demonstrated by their willingness to engage actively with the present study. No important differences can be ob-

Table 5   Profile of Adult Students as Project Managers

Item	Total		2009		2010		2011	
	N	%	N	%	N	%	N	%
Actual study and/or working situation								
Full time student	9	7.8	3	6.4	3	7.9	3	9.7
Studies and work – part time	21	18.1	5	10.6	9	23.7	7	22.6
Studies and work – full time	76	65.5	37	78.7	25	65.8	14	45.2
N/A	10	8.6	2	4.3	1	2.6	7	22.6
Total	116	100	47	100	38	100	31	100
Actual working experience								
Non-existent	2	1.7	0	0.0	0	0.0	2	6.4
Some to 5 years	34	29.3	15	31.9	13	34.2	6	19.4
More than 5 years	80	69.0	32	68.1	25	65.8	23	74.2
Total	116	100	47	100	38	100	31	100
Gender								
Female	40	34.5	18	38.3	14	36.8	8	25.8
Male	76	65.5	29	61.7	24	63.2	23	74.2
Total	116	100	47	100	38	100	31	100
Age								
Mean (years)	33.1		33.3		32.6		33.3	

served between the population taking the degree and those in the sample. Minor differences arise in the case of the last group analysed compared with the previous two groups, which are more similar. We detect a minor increase in the proportion of full time students, as well as the proportion of those with no work experience.

Competence Evaluation

The aggregated results (all professional students) are presented in Table 6. The information is extracted from the detailed 30 level competence map. Competences are ordered based on decreasing creative tension. This ordering is helpful in order to determine perceived strengths and weaknesses.

The results indicate that the highest creative tension is perceived for *stress tolerance* (defined as the ability to handle unfavourable, tiring and stressful matters and situations and strong emotions), *language proficiency* (ability and courage to use foreign languages), and *communication* (sincere listening and sending messages), irrespective of the course considered. These are complemented with *relationship building* (establishing, maintaining and developing beneficial relationships and unofficial networks) and *innovativeness* (natural and open attitude towards new ideas, views and information) in the first period considered, with *understanding others* (perceiving, considering and understanding other peoples' emotions and views) and *de-*

Table 6   Status of Competences and Competence Groups

Competences	Weaknesses	Stress tolerance Language proficiency Relationship building Communication Innovativeness	Language proficiency Stress tolerance Communication Understanding others Decision quality	Stress tolerance Language proficiency Self-assessment Communication Management
	Strengths	Trustworthiness Initiative Emotional awareness Collaboration Commitment	Conflict management Trustworthiness Initiative Commitment Self-confidence	Trustworthiness Developing others Emotional awareness Initiative Collaboration
Comp. groups	Strengths	Self-knowledge	Self-knowledge	Empathy
	Weaknesses	Motivating oneself Empathy Social skills Self-control Cognitive capability	Motivating oneself Social skills Empathy Self-control Cognitive capability	Self-knowledge Motivating oneself Social skills Cognitive capability Self-control

cision quality (making decisions based on high principles, goals and values) in the second period, and *self-assessment* (understanding one's own weaknesses and strengths) and *management* (management focusing on matters) in the most recent evaluation.

Conversely, professional adult students feel themselves to be strong in *initiative* (perceiving opportunities, seizing opportunities and ability to create new opportunities) and *trustworthiness* (honesty and following professional ethics).

Table 6 also groups the 30 competences into 6 groups of competences. The results show major development opportunities in *cognitive capabilities,* a competence group that includes analytical thinking, conceptual thinking and language proficiency followed by *self-control.* These results are in line with the fact that adults are willing to undertake new learning and they perceive their being (again) in an educational centre as an opportunity.

The purpose of this section was to provide an overview of the personal vision of adult students in relation to competences through self-evaluation. In the following section, we present the results that reflect the opinions and attitudes collected through the post-evaluation questionnaire.

Competence Post-Evaluation

The post-evaluation questionnaire gathers data grouped under the following main areas of interest: the contribution of education to competence development compared with professional experience, willingness to improve, subjective validation of the tool, factors hampering competence development, and demographic characteristics of the respondent (age, gender, pro-

Table 7 The Contribution of Education and Professional Experience
 to Competence Development

Competences	Self control	Self knowledge	Empathy	Motivating oneself	Cognitive capability	Social skills
Prof. experience	5.1	4.8	4.9	5.1	5.0	5.2
Education	3.7	3.8	4.1	4.5	4.6	4.6

Table 8 Need for Change and Intention to Change

Competences	Self knowledge	Motivating oneself	Self control	Social skills	Empathy	Cognitive capability
Necessity to change	3.7	3.9	4.2	4.3	4.3	4.4
Intention to change	4.7	4.9	5.1	5.0	4.8	5.1

fessional experience). This last group of data has already been discussed in the opening of this section.

If competences are knowledge in practice, we believe that education and professional experience are the main contributors to competence development. We asked adult students to assess whether education and professional experience are relevant in competence development, and if they are, to what extent. The responses (see Table 7), rated on a standard 7 point Likert scale of agreement, show that irrespective of the competence groups considered, professional experience is seen as a stronger contributor than formal education. In the view of adult students, education contributes to the development of social skills, cognitive capability and motivating oneself, while professional experience develops self-control, self-motivation and social skills. There was stronger consensus around the role of professional experience.

Another interesting point is the degree of consensus on the need for change and the actual intention to change. The pattern of results show consistency in terms of the gap between these two items, with the obvious trend that respondents assign higher levels of agreement to the intention to change. The results in Table 8 are arranged according to a decreasing perceived need for change. It is interesting to observe that adult students express the greatest need for change and the strongest intention to change in relation to cognitive capability. This may, to some extent, be described as motivation to learn.

It is interesting to observe that intention exceeds necessity to change. A strong intention towards change is synonymous with high disposition and immediate action implementation as a contributor to competence development. This represents a very positive starting point of the complex process of competence development. However, it should be complemented with a clear action plan formulated by the student and agreed with his/her tutor or teacher.
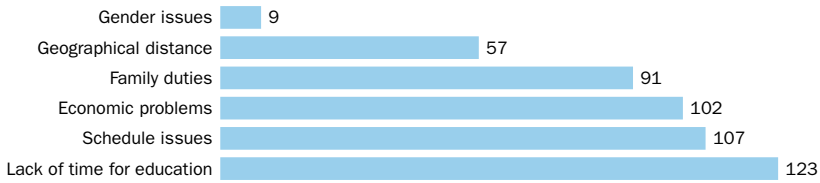
Gender issues	9
Geographical distance	57
Family duties	91
Economic problems	102
Schedule issues	107
Lack of time for education	123

Figure 2 Barriers for Competence Development

Table 9 Subjective Validity of the Tool

Competences	(1)	(2)	(3)	(4)	(5)
Empathy	3%	9%	30%	29%	30%
Self Knowledge	6%	13%	20%	29%	32%
Motivating oneself	5%	10%	19%	37%	28%
Cognitive capability	5%	7%	23%	33%	32%
Self control	5%	10%	18%	38%	29%
Social skills	3%	10%	15%	30%	42%

Notes (1) strongly disagree, (2) disagree, (3) neither agree nor disagree, (4) agree, (5) strongly agree.

Once necessity and intention to change are assessed, it is interesting to tackle whether a specific circumstance acts as a barrier or hampering factor. Arranged from more to less importance in Figure 2, the lack of time for education, schedule issues, economic problems and work-life balance are the main difficulties for competence development. Geographical distance and gender issues are less relevant.

Since the present study introduces a new tool for competence self-assessment, it is important to assess the degree to which respondents consider the tool to be valid. The results shown in Table 9 indicate substantial levels of agreement in all considered competence groups. The lowest level of agreement (as a sum of the *agree* and *strongly agree* options) was 58% in the case of empathy, followed by 61% for self-knowledge, 64% for motivating oneself, 65% for cognitive capability, 67% for self-control and finally 72% for social skills.

Discussion of Implications

Our research has a series of possible implications both for research and for the practitioner community, which are detailed below.

Research Implications and Originality/Value

The *Human Resource Management Review* devoted two Special Issues in 2009 to the discussed issue; namely, one to collecting *emerging trends* in the field and the other to highlight *critical issues* in HRM theory and research. It stated that research involves extending previous work by a)

using a different subject population, b) using a different operationalization of one or more variables, c) including different levels of a variable than were studied previously, d) simultaneously examining two variables that have in the past only been studied independently, e) including potential mediating and moderator variables, or f) extending previous work in a variety of other ways.

Accordingly, we first explore an emerging field of HRM – competence assessment and development. Second, we bring valuable empirical evidence provided by a special subject population, adult students who have considerable professional experience in a field characterized by project-based work. They return to university to achieve a higher education degree. Third, we manage examined individuals' visions of competence from a global, aggregate, and group perspective.

Complementarily, this study has a series of practical implications which will be discussed briefly in the following.

Practical Implications

The practical implications of the study are various, according to the actors and institutions involved.

Individuals, adults in this case, gain knowledge and visual representation of their own perception of their level of competence necessary to perform project management. The results of self-evaluation are immediate and easy-to-understand. They represent a possible starting point towards a professional development plan. Once self-evaluation has been formally performed, students become more aware of possible development gaps and they may become more committed to change. Active managing of the learning process is part of the same student-centred learning model. ICTs offer a wide range of tools in the educational area – digital content, knowledge sharing platforms, communication – and they also generate positive attitudes. In the case of our specific study, we believe that students show a rather proactive attitude towards the competence aspect of their curricula.

Group level results are important for *teachers/educators* in order to orient their regular activity towards more innovative student-centred teaching/learning that takes into account the diversity of learners. This is considered a critical issue in recent HR management trends. Developing competences has become an important complement to regular teaching/learning. If educational centres promote a competence culture, teachers should be their voice. They might experiment with important changes in both working methods and material provided to students. An illustrative example is Spanish students' relatively low level of English language knowledge. This is reflected in the competence assessment map, where language proficiency is detected as a desired priority development area. Students are often ret-

icent about reading and handling tasks based on the material provided in a foreign language. Once both students and educators are aware of the development areas and they share the common objective of improvement through learning, a new situation is created. It generates commitment on all sides; the achievement of the goal is made more probable. Another issue concerns individual tutorial activity. The guiding role of teachers can be adapted to personal competence specificities and needs, consequently, a more customized system of tutoring is possible. This later could turn into better student results and greater student satisfaction.

Educational management or committees in charge of improving the quality of teaching can enrich their inputs with competence-base knowledge. Overall, competences can be considered a measure of superior work performance. It is the aim of any educational institution to provide competent graduates to the labour market, and to improve the levels of those who are already in the labour market. Students' work performance is a result of their previous educational experience and evaluation of competences is important from this point of view. Competence assessment, or in its more advanced form, university competence certification (as in the case of some UK universities) can make the difference between competitors. Another strategic argument is that competence development of students is a relatively new area of intervention for teaching staff. Specific training, tools and methods should be provided at this early stage in order to ensure, first, a positive attitude on the part of teachers/educators towards the topic, and second, that appropriate actions are taken to handle this new scenario.

Conclusions

In the new era of education based on *student-centred teaching/learning,* didactic approaches are increasing in importance. Managing student diversity, responding to their particular needs, cooperating with them, and having common objectives are some of the principles of modern universities. Competence assessment and development is a relatively recent issue that needs to be considered alongside older concerns, and research in the field of university competence development is still at a very early stage.

This article has explored the results of a self-evaluation of project management competences by a group of adult students. Linking regular teaching with competence development is a challenging task. Universities developed the framework, designed the strategy, formulated the objectives and ICT makes it feasible in practice. Although regular teaching has standard performance evaluation systems, at this stage, we still lack measurement tools to evaluate competence performance.

In this article we have presented a web-based tool to evaluate competences. We have illustrated its use and provided empirical evidence of its

perceived validity. The choice of competence assessment tool is of vital importance in evaluating outcomes. In our view, the most important issue in the evaluation is the detection of development gaps and the generation of awareness regarding these gaps. Intention and motivation towards change are also stimulated. The tool presents reasonable acceptance levels and it has a series of advantages for the different communities involved.

Generating knowledge and learning on a continuous basis should be a priority for both individuals and organizations. Universities, by their nature, provide a good example of this notion. Adult individuals represent a relatively neglected target of the universities. Traditional business concepts, such as competences, innovation, and service-orientation, call for higher quality and, consequently, radical changes in the system. This paper attempts to combine all these elements and test them in a middle-sized, non-elite higher education institution in Spain. It is likely that there will be parallel developments, and the results may be applicable, in many similar organizations worldwide.

Future research should address the extension of the present results, broken down by gender, as well as the application of more sophisticated statistical approaches. It is important for universities to expand and diversify their target population, while international comparisons and detailed analysis of some specific competences (like *innovation* or *initiative*) are planned future priorities.

References

American Library Association (1926). *Libraries and adult education: Report of a study made by the American Library Association.* Chicago, II: American Library Association.

Aramo-Immonen, H., Koskinen, K. U., & Porkka, P. L. (2011). The significance of formal training in project-based companies. *International Journal of Managing Projects in Business, 4*(2), 257–273.

Bikfalvi, A., Llach, J., Kantola, J., Marques, P., & Mancebo, N. (2007). Complementing education with competence development: An ICT-based application. *International Journal of Management in Education, 1*(3), 231–250.

Boyatzis, R. E. (1982). *The competent manager.* Hoboken, NJ: Wiley.

Chang, Y., Eklund, T., Kantola, J., & Vanharanta, H. (2009). International creative tension study of university students in South Korea and Finland. *Human Factors and Ergonomics in Manufacturing & Service Industries, 19*(6), 528–543.

Chang, Y., Kantola, J., & Vanharanta, H. (2007). A study of creative tension of engineering students in Korea. *Human Factors and Ergonomics in Manufacturing & Service Industries, 17*(6), 511–520.

Commission of the European Communities. (2006). *Adult learning: It is never too late to learn* (Communication from the Commission COM (2006) 614 final). Brussels: Commission of the European Communities.

Dencker, J., Joshi, A., & Marocchio, J. (2008). Towards a theoretical framework linking generational memories to workplace attitudes and behaviours. *Human Resource Management Review, 18*(3), 180–187.

DeSeCo. (N. d.). *Definition and selection of competencies: Theoretical and conceptual foundations.* Retrieved from http://www.deseco.admin.ch

Directorate-General for Education and Culture. (2011). *Pre-study on the role of higher education institutions as providers of continuous professional learning and adult education.* Retrieved from http://ec.europa.eu/education/more-information/doc/2011/higher_en.pdf

Draganidis, F., & Mentzas, G. (2006). Competency based management: A review of systems and approaches. *Information Management & Computer Security, 14*(1), 51–64.

European Association for the Education of Adults. (2006). Adult education trends and issues in Europe. Retrieved from http://ec.europa.eu/education/doc/reports/doc/adulttrends.pdf

European Association of Universities. (2008). *European universities' charter on lifelong learning.* Brussels: European Association of Universities. http://www.eua.be/fileadmin/user_upload/files/Publications/European_Universities__Charter_on_Lifelong_learning.pdf

Employment and Training Administration. (2007). *Adult learners in higher education barriers to success and strategies to improve results* (ETA Occasional Paper 2007-03). Washington, DC: Office of Policy Development and Research.

Fogg, C. D. (1999). *Implementing your strategic plan: How to turn 'intent' into effective action for sustainable change.* New York, NY: American Management Association.

Kantola, J., Karwowski, W., & Vanharanta, H. (2011). Managing managerial mosaic: The Evolute methodology. In *Electronic globalized business and sustainable development through IT management: Strategies and perspectives* (pp. 77–89). Hershey, PA: IGI Global.

Kantola, J., Vanharanta, H., & Karwowski, W. (2005). The Evolute system: A co-evolutionary human resource development methodology. In W. Karwowski (Ed.), *International encyclopedia of ergonomics and human factors* (pp. 2894–2900). Boca Raton, FL: CRC Press.

Kasworm, C. E. (1990). Adult undergraduates in higher education: A review of past research perspectives. *Review of Educational Research, 60*(3), 345–372.

International Project Management Association. (2006). *IPMA Competence Baseline Version 3.0.* Nijkerk, The Netherlands: IPMA.

Liakhovitski, D., Stone-Romero, E., & Jaccard, J. (2008). Strategies for detecting joint dichotomous moderators in human resource management research. *Human Resource Management Review, 18*(3), 164–179.

Liikamaa, K. (2006). *Piilevä tieto ja projektipäällikön kompetenssit* [Tacit Knowledge and Project Managers Competencies]. Tampere, Finland: Tampereen teknillinen yliopisto.

Makatsoris, C. (2009). An information and communication technologies-based framework for enhancing project management education through competence assessment and development. *Human Factors and Ergonomics in Manufacturing & Service Industries, 19*(6), 544–567.

National Research and Development Centre for Adult Literacy and Numeracy (2010). *Final report for: Study on European terminology in adult learning for a common language and common understanding and monitoring of the sector.* Retrieved from http://www.pedz.uni-mannheim.de/daten/edz -b/gdbk/10/adultreport_en.pdf

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.

Powell, R., Smith, R., & Reakes, A. (2003). *Defining common issues across Europe for adult education: Final report.* Retrieved from http://www.leeds .ac.uk/educol/documents/00003622.htm

Research voor Beleid. (2010). *Key competences for adult learning professionals: Contribution to the development of a reference framework of key competences for adult learning professionals; Final report.* Retrieved from http://ec.europa.eu/education/more-information/doc/2010/keycomp .pdf

Roberts, G. (1997). *Recruitment and selection: A competency approach.* London, UK: Chartered Institute of Personnel and Development.

Shippman, J. S., Ash, R. A., Battista, M., Carr, L., Eyde, L. D., Hesketh, B., Kehoe, J., Pearlman, K., & Sanchez, J. I. (2000). The practice of competency modeling. *Personnel Psychology, 53,* 703–740.

Spencer, L. M., & Spencer, S. M. (1993). *Competence at work: Models for superior performance.* New York, NY: Wiley.

University of Girona. (2006). *Guide to adaptation to the European Higher Education Area: 1. competences.* Retrieved from http://www.udg .edu/Portals/79/vicerectorats/Docencia%20politica/01_Guia_EEES _eng.pdf

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