Competence certification as a driver for professional development: A IT-related case-study

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Abstract— **Human resource managers have typically used certifications as an indicator of an individual skill set suitability for a specific position. Certifications act as a signal to hiring managers that a job candidate has achieved a level of knowledge and skill necessary to perform in a particular job role. In the IT (Information Technologies) sector, a recent study sought to determine if human resource managers (HR) and IT professionals perceived certifications differently in the context of the hiring process [7]. The purpose of this exploratory case study was to determine how IT professionals perceive certification programs as a professional training alternative, when compared with more traditional education settings, and the kind of effect the effective participation in one of the programs has in that judgment. The data for this exploratory study was gathered from a 58 employee sample of a Portuguese-based multinational software engineering company. An experimental *Competence Certification Effects Scale* (CCES) was used, and after a consistency analysis, the original 22 items were reduced to 17, grouped in a 4-factor structure: *"Intrinsic Value"*; *"Certification as Training"*; *"Career Management"*; and *"Effort Trade-off"*. Cronbach`s alphas were .81, .81, .83, and .81, respectively.**

In short, the findings of the study indicate that there is a significant difference in the perceived usefulness of a certification, if an employee participates or not in a dedicated certification program. This difference is more significant in more senior, management-related roles, as for junior engineers that don't participate in a certification program, this participation isn`t seen as a professional development anchor or a valid education driver. The paper presents and discusses the study`s main results in points III to V, after describing methodological aspects and the underlying theoretical framework.

Keywords-component; Competency certification; Self-directed learning; Career management

I. LEARNING AND TRAINING IN THE CONTEMPORARY WORK SPACE: THE IT SECTOR CASE.

In present contemporary workspaces, punctuated by severe competition pressures, the accelerated incorporation of technology in work processes, and the prevalence of high paced information exchanges and commercial trades in a worldwide scale, the individual, group and organizational differentiation that can co-exist in work organizations is a fundamental attribute in their current social development consolidation paths. Having this setting in mind, the certification of professional competences represent one of the available alternatives to adjust the workforce to flexible work processes demands, also responding to social and labour rights compliance needs ([1], [7], [14]).

It is fairly documented that the contemporary society is characterized by rapid developing and ever-changing political, social, economical, technological and environmental situations. Consequently, living in the 21st century is making great demands on its members in virtually every aspect of their lives. Technology subjects and the engineering domain are, in particular, affected by this situation. As a result of this, educational approaches have changed over the last century from remedial repetitive learning to today's learning, which focuses on acquiring an understanding of how to become more independent in the learning process [3]. Learning is no longer concentrated mainly in the first stages of human life through formal education and specific training in business, but it becomes a day-by-day routine over a individual's life cycle. This situation requires new forms and channels to animate learning processes.

Considering the set of institutional devices that is possible to trigger or implement to get a enriched adjustment of each worker to a particular job role, professional training currently occupies a prominent role, as it represents a strategic process to adapt the knowledge profile of a company`s workforce. Nowadays, corporate training and education services correspond to a fundamental regulation tool in the competence development domain, and must be understood not only as an economical or organizational redesign resource, but also as a personal change opportunity, in the sense that provides a setting to change a worker`s behaviour, beliefs and knowledge pool. In fact, according with Tajfel`s social identity theory [17], it`s reasonable to suppose that professional training practices act in order to enable positive social identity dispositions and a satisfactory self-image, as a training program participation has a positive effect in terms of self-esteem, in those that are enrolled and make part of it.

The current value that his given to learning processes in the workplace, has a different origin than the seminal 19th century goals that justified the emergence of skill enhancement measures, has a way to enable the industrial labour force

cultural emancipation; currently, continuous learning and skill development are closed linked to productivity, quality and aggressive competition needs, that highlight the workplace as one of the most relevant social locus to support (formal and informal) learning processes. Authors like Lave and Wenger [12], and Billett [3] consistently state that a workspace, whatever its context or specificity, is the ideal social milieu to promote individual and group-related learning and social integration, due to the tight connection that it promotes, by articulating the theorical "world" with professional, concrete practices.

In this sense, it`s understood that formal education and training (and certification) contribute to only a small proportion of learning at work [10]; developing a understanding of situations, colleagues, the work unit and the organisation are examples where learning primarily occurs while working, rather than in a formal educational setting [3]. Similarly, much learning that occurs at work depends upon peer interaction and knowledge sharing, and the use of knowledge resources outside formal education and training settings.

The possibility of each individual become a co-creator of his/her education biography through the lifespan, is a tendency that reinforces the idea of multiplication and co-existence of multi-level learning locus in contemporary work organizations. When employee development budgets are being scrutinized, blending learning into the way work is done is more important than ever. Organizations need their learning approach to be more innovative and efficient than ever before - to make the most of technology advancement, reach geographically dispersed learners, and meet budget requirements. If what people need to learn is defined by organizational business priorities, new learner-centered mediums integrate this learning into the workflow.

Self-paced learning mediums depend of several individual cognitive attributes, such as self-management and learner control, self-direction and motivational dispositions [6], and particular development needs of each employee, with little or none external supervision. With this medium, individual motivation to engage in learning tasks and the external encouragement of their fulfilment, are primary drivers that enlarge education domains to virtual, technology-driven immaterial learning contexts, changing the way learning processes are seen, making them more accessible, dynamic and flexible [4]. Through technology and, in particular, web-based developments, it is easier to communicate, share ideas and specific knowledge.

Despite these changes, it`s rather relevant to teach people how to use the technology to have a social learning experience and collaborate in knowledge sharing, and, in a organizational setting, to learn how to mediate a process that has as drivers subjective and relational features. To some extent, learners need to learn how to capitalize knowledge on the social milieu, by learning to learn with and from others, and managers are asked to learn to mediate others' learning, not only for their sake but for what that will teach oneself, and learning to contribute to the learning of a collective.

Duderstadt [9] suggests that we are experiencing a shift from just-in-case to just-in-time to just-for you education, equivalent to a shift from synchronous, classroom-based instruction to asynchronous e-learning, to ubiquitous learning opportunities. This author uses ubiquitous learning to refer to a culture of learning in which people are continually surrounded by, immersed in, and absorbed in learning experiences; a necessity in a world driven by an expanding knowledge base and need for continuous learning.

Organizational training processes goals cannot be resumed to merely instrumental, business-driven targets that, despite the legitimacy, erode the emancipation and development potential associated with that processes implementation. Training practices are valued by stakeholders as inclusive strategies, a symptom of a organization`s maturity and concern to address its labour force particular skills and career development needs.

Promoting an autonomy and learner-centered culture opens the possibility for a organization to experiment different strategies for addressing skills adjustment needs, allowing individual initiatives in the definition of career and development projects. Self-paced instruction and computer-based training, training delivery forms that can be triggered within a anytime, anyplace approach, have been gaining visibility as valid alternatives to conventional instructor-led classroom training.

In this context, the particular question of how to validate new skills and knowledge informally build is frequently raised. Credentials and certification programs, used by HR managers as indicators of an individual skill set suitability for a specific position, currently are in the spotlight as career and skill development anchors [2]. The participation in certification program is recognized as faster, cheaper, and more focused education alternatives, yet, many questions arise around the issue of how occupation specific credentials compare with the more traditional educational qualifications.

According to Bird [4], a changing economy and job market places a higher value on knowledge and applied skills. In the IT sector, a domain where credentials and certifications are increasingly being valued, certifications act as a signal to hiring managers that a job candidate has achieved a level of knowledge and skill necessary to perform in a particular IT job role. The findings of a recent study [7] indicated that managers placed a greater emphasis on certifications when hiring for IT related positions. The question of whether certified individuals are better able to perform in an IT job-role, than non-certified individuals becomes relevant in the hiring process [1].

Existing theory provides a strong conceptual framework for examining the role of industry credentials in recruitment for IT positions. Qualifications and credentials have long served as signals for organizations. Signaling theory, originally developed in economics, suggests that employers require information (observable characteristics and attributes of an individual) about potential employees to determine the job positions and salaries offered to the employee ([15]; [14]). Some observable attributes of individuals are unalterable (e.g., age, gender), while others are subject to change usually at the initiative of the individual (e.g., education). Spence [15] referred to these alterable attributes as signals.

Presently, any individual can claim to be an "expert" in a particular process, subject matter or technology. But for employers, quality assurance is vitally important in this context. Since employers have incomplete information about the knowledge, skills, and abilities of applicants, they use qualifications and credentials as signals for making inferences about missing information in determining the likely suitability of prospective employees [14]. The value that organizations place on different qualifications can also act as a signal to applicants. For example, organizational preferences for either externally validated assessment of skills (IT or management certifications, for instance) or more traditional college qualifications provide applicants with information about what it would be like to be a member of that organization, and what type of skills and knowledge it values.

The demand for workers with specialized skills has placed a considerable pressure on traditional educational strategies to provide a qualified and sustainable workforce. In the IT sector, certifications have become a standard precursor to employment for many IT job roles serving as a "work ready" indication to HR managers, that specific precursory knowledge or competencies have been met.

Despite the growth in the use of these programs as institutional training alternatives, their success isn`t linearly guaranteed, as they depend, in a considerable scale, of the applicants` commitment to learn, their ability to control and pace learning activities, and the existence of external support and encouragement. These variables are particularly relevant if the certification programs success largely depend of self-paced learning efforts [6], a potentially conflictive context where learning activities can be seen by applicants as a result of personal investment, and not as a result of a corporate learning policy.

II. METHOD

The relevance of this study is associated with the raising importance of learner and individual-centered learning processes, and the diversification of training strategies and learning *foci* that can co-exist in contemporary workspaces; in particular, the study is centered in the growth of competency certification programs in the IT sector, and in the way these programs and concrete participations on them are perceived by certification applicants.

In terms of analytical focus, a case-study research strategy was applied in a portuguese multinational IT-based company, whose activity combines expertise in several engineering disciplines, enabling software solutions for demanding and crosscutting problems. The company's engagement model covers the whole software life-cycle, from planning and analysis, to design, development, integration, testing and maintenance, and focus on enterprise oriented solutions for different markets. This organisation fosters constant innovation and the use of training and learning management top notch practices, providing all workers the best possible training for a large range of job roles. As the job requirements are becoming increasingly specialised, the implementation of certification programs in technical, managerial and language skills domains

has become, during the past years, a relevant training instrument.

These programs are supported by practical seminars, informal peer-based knowledge sharing, and, to some extent, self-directed learning that is encouraged by the organization`s team and area managers. In the past two years, more than 70 certifications were obtained, but, despite these success evidences, this exploratory case study aims to determine how IT professionals of this particular organization perceive certification programs as a professional training alternative, when compared with more traditional education settings, the personal investment implied in the participation in one of this programs, and the kind of effect the effective participation in one of the programs has in the global judgment made about its efficiency and relevance.

A. Participants

The data for this exploratory study was gathered from a 58 employee sample of a portuguese based multinational software engineering company. An experimental *Competence Certification Effects Scale* (CCES) was designed and applied using a web-based questionnaire management tool.

TABLE I.   CASE STUDY PARTICIPANTS: GENERAL DEMOGRAPHIC CHARACTERISTICS (N=58)

		n	%
Gender	M	54	93.1
	F	4	6.9
Age	24-29	29	50.0
	30-35	22	37.9
	36-43	7	12.1
Participation in a certification program (past 12 months)	Yes	31	53.4
	No	27	46.6
Job role	Junior Engineer	26	44.8
	Project Engineer	11	19.0
	Senior Engineer	2	3.4
	Engineering Manager	5	8.6
	Business Developer	1	1.7
	Project Manager	13	22.4
Years worked in company	≤ 1 year	19	33.8
	2 a 3 years	25	43.1
	4 a 5 years	10	17.2
	6 a 7 years	1	1.7
	8 a 9 years	1	1.7
	10 a 11 years	1	1.7
Total		*58*	*100*

The primary criteria used to identify the study participants, was the effective participation in a competency certification program in the 12 months prior to the scale`s application, or a planned participation in the 12 months period subsequent to the

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CCES application. The participants` age varies between 24 and 43 years old, and as is presented in *Table 1*, there is a larger, but non-significant, percentage of study participants that effectively engaged in a certification program (53,4%). *Table 1* also shows that 26 of the 5 study participants occupy junior engineer roles, and 77% of the participants work in the company considered in the study for 1 to 3 years.

B. Procedure

This study`s deployment implied the request for participation of a group of employees, according the criteria described in the previous topic. 60% of the enrolled study employees replied to the participation request, and 58 scale answers were gathered and considered in the analysis procedures. The participation in the study was voluntary. According with the research questions and hypothesis – the concrete participation in a certification program has a positive modulation effect, in the way these programs are perceived as relevant skills and career development anchors –, a 22 Likert-like items exploratory scale was designed, with 5 answer options available for each item [1], ranging between total disagreement (1) and total agreement (5). The original *Competence Certification Effects Scale* (CCES) had 22 items, but after a communalities analysis (h^2) (see *Table 2*), five of the original items pool (items CCES_1, CCES_2, CCES_12, CCES_14 e CCES_22) didn`t reach the required cut point, 0.40 [16], and due to this they were removed form the analysis procedures.

The items used in the scale were inspired or adapted of previous learning and competency certification-related studies of Lave and Wenger [12], Candy [6], Rainbird [13], Cegielski [7], Souza and Luciano [14], and Billett [3]. To compile statistical measures, SPSS 17.0 was used as support tool. In order to explore the proposed scale underlying dimensions a exploratory factorial analysis was used; factor extraction used the principal components method and orthogonal *varimax* rotation. The adequacy of the factorial analysis was evaluated by means of the Kaiser-Meyer-Olkin test and Bartlett's sphericity test.

The CCES 17 final items inter-correlations matrix was subjected to analysis, and a 4-factor solution was found, with a total explained variance of 65.48%; the underlying sense of each factor was interpreted, and the scores of the first factor (F1: ValInt) were used as a indicator of a certification perceived intrinsic value, the second one was related with the value of a certification program as a institutional training option (F2: ValCertTrain), the scores of the third were related with career management effects (F3: CertGestCarr), and the fourth linked with the investment and effort trade-off (F4: EffortTrade) implied in a certification program participation. In order to identify group differences, *t* and *one-way* ANOVA tests were made, according with the groups formed by the independent variables *certification program participation*, *age* and *job role*, variables with a relevant effect in the explanation of the differences that were found. The adopted level of statistical significance was p ≤ 0.05.

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[1] Some inverted items were included in the exploratory study scale (CCES).

III. RESULTS

The standardised coefficient alpha was used to estimate internal consistency for the CCES final scale and the results obtained for the 4-factor structure solution – "*Certification intrinsic value*"; "*Certification as training*"; "*Career management effects*"; and "*Effort trade-off*" – were .81, .81, .83, and .81, respectively. All items were positively correlated with the scale with the target item removed, when their correlations were examined by standard alpha coefficient analyses, a result that confirmed the relevance of the scale`s final 17 items.

The adequacy of the factorial analysis was evaluated by means of the Kaiser-Meyer-Olkin test and Bartlett's sphericity test. The KMO test score (KMO = .807 [≥ .60]) validates data adequacy to take the factorial analysis solution in consideration; Bartlett's sphericity test is also statistically significant (χ^2 =590.714 p = .000 [≤ .05]). After a communalities analysis (h^2) (see *Table 2*), five of the 22 original items pool (items CCES_1, CCES_2, CCES_12, CCES_14 e CCES_22) didn`t reach the required cut point, 0.40 [16], and due to this they were removed form the analysis procedures.

In order to explore the proposed scale underlying dimensions a exploratory factorial analysis was used; factor extraction used the principal components method and orthogonal *varimax* rotation, with factor retention for factors with *eigenvalues* greater than 1. The analytical procedures revealed a 4-factor solution with an *eigenvalue* greater than 1 ([5]; [11]), accounting for 65.48% of total explained measure data variance. Cattell`s screen test corroborated this observation. *Table 2* shows the 4-factor solution found for the measures, the scale items and correspondent communalities. Significant loadings, superior to .50 [16], were found for all factors.:

A. Participation effect in the value perception of a competency certification program

In what concerns the effect of participating or not in a program, taking into consideration the data gathered, it`s possible to see in *Table 3*, that the effective participation in a program has a relevant effect in the way a certification is seen, in terms of its intrinsic value (see F1: ValInt scores), its efficiency as training alternative (see F2: ValCertTrain scores), the associated effects related with career management possibilities (see F3: CertGestCarr scores), and the personal effort implied in the learning activities inherent to a program participation (see F4: EffortTrade scores).

Table 3 also reveals that there is, in particular, a significant statistical difference in the perceived intrinsic usefulness of a certification (see F1: ValInt scores), if an employee participates or not in a certification program. Despite this evidence, the scores obtained in this domain aren`t very high, when compared with the scores related with the efficiency of a certification as a possible training alternative (see F2: ValCertTrain scores), or a participation associated effects related with career management possibilities (see F3: CertGestCarr scores).

This suggests, in our opinion, that certification-oriented training programs tend to be judged in an instrumental way, more by its positive effects, benefits or rewards in terms of career management or professional within-peers recognition, than by its intrinsic value as institutional or personal development drivers. Besides the displayed analysis, a ANOVA data variance analysis was made, taking as independent variables the participation in a program and the job role of the participant, in order to perceive the nature of these variables interaction in the perceived intrinsic usefulness of a certification domain.

The effect that was obtained is statistically significant ($t = 3.79$, $p \leq .05$)

TABLE II.   FACTOR LOADINGS MATRIX, AND ITEM COMMUNALITIES (H^2).

Factor	Item[2]	Loading	h^2
F1 [ValInt]	(CCES_3). A certified professional has a better job performance than a non-certified professional.	.724	.642
	(CCES_8) [inv]. A certification doesn`t validate a professional`s past experience or competency.	.695	.570
	(CCES_11) [inv]. A professional that isn`t certified feels less confident in his/her work execution.	.670	.459
	(CCES_19). A certification increases a professional`s level of confidence and his/her ability to be more competitive.	.636	.615
	(CCES_7). A certification is a quality guarantee of a professional`s services.	.594	.571
	(CCES_18). To be certified is to be a member of a distinctive professional group.	.556	.616
F2 [ValCertTrain]	(CCES_17). The certification is a motivating mechanism, because it helps the professional to obtain new certifications by learning new abilities.	.819	.712
	(CCES_21) [inv]. A professional certification, when compared with other training mechanisms, is a bad investment for a work organization.	.777	.737
	(CCES_9) [inv]. A professional certification isn`t necessarily a good career development driver.	.730	.644
F3 [CertGestCarr]	(CCES_10). A certified professional can obtain better salaries and benefits.	.856	.756
	(CCES_4). A certification is a driver to win several professional battles.	.703	.659
	(CCES_16). A certification can help to get a new job, in a faster and more adjusted way.	.703	.731
	(CCES_15). A certification enables a professional development congruent with personal and professional project and aspirations.	.448	.605
	(CCES_20). A certification is a proof that a professional deeply knows a particular matter, product or technology.	.421	.530
F4 [EffortTrade]	(CCES_5) [inv]. There is a large amount of psychological effort in a certification program, and the benefits don`t compensate these costs.	.881	.822
	(CCES_6) [inv]. To get a certification demands a excessive effort, when compared with possible benefits.	.820	.746
	(CCES_13) [inv]. Getting a certification mainly result from industry and market pressures, not from personal or organizational benefits.	.675	.719

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[2] The scale version used in the study was originally in Portuguese.

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TABLE III.

TABLE III.   PARTICIPATION EFFECT IN THE VALUE PERCEPTION OF A COMPETENCY CERTIFICATION PROGRAM.

F1	Participation	No participation	F2	Participation	No participation	F3	Participation	No participation	F4	Participation	No participation
M	2.96	2.69	M	4.14	3.91	M	3.85	3.82	M	4.12	3.56
SD	.65	.92	SD	.88	.81	SD	.67	.80	SD	.93	.75
t	3.79		t	.20		t	.28		t	.45	
p	.05		p	.65		p	.60		p	.50	

TABLE 4

TABLE IV.   VALUE PERCEPTION OF A COMPETENCY CERTIFICATION PROGRAM: JOB ROLE AND PROGRAM PARTICIPATION INTERACTION EFFECT (MEANS).

[Participation/No participation] F1 (average)	Junior Engineer	Project Engineer	Senior Engineer	Engineering Manager	Business Developer	Project Manager	Total (n=58)
Participation in a certification program	2.81	3.02	3.17	3.25	n.a.	2.97	**2.96**
No participation in a certification program	2.68	1.79	n.a.	1.50	3.83	3.15	**2.69**
Total	2.74	2.58	3.17	2.90	3.83	3.08	**2.83**

The analysis of the differences obtained in terms of the perceived intrinsic usefulness of a certification, considering the participants job role (see *Table 4*), reveals that higher scores are registered in management-related roles, as for engineering roles, and in particular, junior roles that don't participate in a certification program, a certification isn`t intrinsically valued as a valid professional development anchor or education driver. In these cases, expectations are somewhat low, but the effective participation in a program, apparently has a positive effect in revamping previous (low) beliefs and expectations related with the perceived intrinsic usefulness of a certification; aligned with these observation, we can state that, for this study`s sample, participation itself helps to enhance the way a certification program is intrinsically valued.

III.B. *Age and job role effect in the value perception of a competency certification program.*

Checking the effect of the variable *age* in the value perception of a competency certification program, reveals that there are differences in the perceived usefulness of a certification, and higher scores are obtained in elderly participants

groups (in particular, in the measure domains F1 and F3); in a broad sense, the older the participant is, the more likely is him/her to value the participation in a certification program.

A remark must be made, however, about this assumption: for more senior participants, probably due to the position that they already occupy in the organization (40% are Project or Senior Engineers, and 30% are Project Managers), the effort trade-off implied in a program participation isn`t unequivocally favoured (see F4 scores). Statistically significant differences were obtained in this domain (t = 3.98; p < .05), as can be seen in *Table 5*.

It`s reasonable to suppose that the higher score obtained for the intermediate age group (30-35y) can be associated to the career development stage the participants are immersed in, in the sense that a ascendant career phase can help to perceive a

personal learning investment as reasonable, desirable or manageable, having in mind possible future benefits; this doesn`t occur so clearly with younger or older participants, as these benefits aren`t so clearly projected, due to the junior, low-hierarchy or more senior, top-hierarchy roles these participants have. In this sense, the variation in the degree of engagement to reason and manage the personal effort implied in a program participation and correlated learning activities, is a important variable to predict the success of these programs, and must be seen with particular caution by those who promote them, as part of a corporate skills development strategy.

TABLE 5
Age effect in the value perception of a competency certification program.

		24-29y	30-35y	36-43y
F1 [ValInt]	M	2.70	2.87	3.29
	SD	.75	.86	.64
	t	1.65		
	p	.20		
F2 [ValCertTrain]	M	3.83	4.24	4.24
	SD	.92	.81	.50
	t	1.77		
	p	.18		
F3 [CertGestCarr]	M	3.66	4.00	4.03
	SD	.77	.70	.54
	t	1.66		
	p	.20		
F4 [EffortTrade]	M	**3.61**	**4.26**	**3.62**
	SD	.91	.77	.78
	t	3.98		
	p	**.02**		

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The efficiency of a program partially depends of the participants` commitment degree, and the foreseen career development opportunities associated with these participations.

Work division, organization structures and job roles career lines condition the scope and range of these opportunities, subjectively linked to promotions, functional mobility and compensation improvements. In this study, the effect of the variable job role in the value perception of a competency certification program was considered, when analyzing the differences obtained in terms of the perceived intrinsic usefulness of a certification, considering the participants job role (see *Table 4.2*); as referred, higher scores were registered in management-related roles.

This relation is corroborated by a ANOVA data variance analysis, taking as independent variables the participation in a program and the job role of the participant, in order to perceive the nature of interaction of these variables in the perceived effects of a participation in terms of career management opportunities (see *Table 6*). The effect that was obtained is statistically significant (F = 3.69, p < .05).

IV. DISCUSSION

The findings of the study fairly corroborate the initial research hypothesis related with a predicted positive effect of a concrete participation in a certification program, in the way these programs are perceived as possible skills and career development anchors. Significant differences were found in the perceived usefulness of a certification, if an employee participates or not in a certification program. The exploratory scale (CCES) presents satisfactory psychometric qualities in the used sample, but further studies are necessary with larger samples to further test the scale in other organizational contexts. In a overall sense, four specific remarks must be addressed, concerning the results that were found related with the perception of a certification program as a professional training alternative (when compared with more traditional education settings), the personal investment trade-off implied in the participation in one of these programs, and the kind of effect the effective participation has in the global judgment made about a certification program efficiency and relevance:

TABLE V.   CAREER MANAGEMENT CERTIFICATION PROGRAM EFFECTS: JOB ROLE AND PROGRAM PARTICIPATION INTERACTION EFFECT (MEANS).

[Participation/No participation] F3 (average)	Junior Engineer	Project Engineer	Senior Engineer	Engineering Manager	Business Developer	Project Manager	Total (n=58)
Participation in a certification program	3.51	3.91	4.00	4.10	n.a.	4.36	**3.85**
No participation in a certification program	3.83	3.70	n.a.	1.80	4.20	4.08	**3.82**
Total	3.67	3.84	4.00	3.64	4.20	4.18	**3.83**

a) In what concerns the effect of participating or not in a program, taking into consideration the data gathered, it`s reasonable to assume that the effective participation in a program has a relevant effect in the way a certification is seen, in terms of its intrinsic value, its efficiency as training alternative, the associated effects related with career management possibilities, and the personal effort implied in the learning activities inherent to a program participation. There is a significant statistical difference in the perceived intrinsic usefulness of a certification, if an employee participates or not in a certification program; despite this evidence, the scores obtained in this domain aren`t very high, a disposition that suggests, in our opinion, that certification-oriented training programs tend to be judged in an instrumental way;

b) The job role apparently has a modulator effect in terms of the perceived intrinsic usefulness of a certification, as higher scores were registered in management-related roles, and in particular, in engineering junior roles, a certification isn`t intrinsically valued as a valid professional development anchor or education driver. In these cases, expectations are somewhat low, but the effective participation in a program, apparently has a positive effect in revamping previous (low) beliefs and expectations related with the perceived intrinsic usefulness of a certification;

c) In a general sense, the older the participant, the more likely is he/she to value the participation in a certification program. A remark must be made, however, about this trend: for more senior participants, probably due to the position that they already occupy in the organization (40% are Project or Senior Engineers, and 30% are Project Managers), the effort trade-off implied in a program participation isn`t unequivocally favoured.

d)

e) The age-related and job role-related variations in the degree of engagement to reason and manage the personal effort implied in a program participation and correlated learning activities, is a important variable to predict the success of these programs, and must be seen with particular caution by those who promote them, as part of a corporate skills development strategy.

V. CONCLUSIONS

The relevance of this study is associated, we think, with the raising relevance of learner and individually-centered learning processes, the shift from *just-in-case* to *just-in-time* to *just-for you* education approaches [9], and the diversification of training strategies and learning *loci* that can co-exist in contemporary workspaces. Despite the growth in the use of these programs as institutional training alternatives, their success isn`t linearly guaranteed, as they depend, in a considerable scale, of the applicants` commitment to learn, their ability to control and pace learning activities, and the existence of external support and encouragement, and, for this study`s sample, the age and job

role of the certification program applicants. These variables are particularly relevant if certification programs success largely depend of self-paced learning efforts, a potentially conflictive context where learning activities can be seen by applicants as a result of personal investment, and not as a result of a corporate learning policy.

Investing in formal self-paced learning efforts within the workspace imply a shift in the way training periods are conventionally planned in work organizations; creating multiple learning *loci* in contemporary workplaces, using, for instance, competency certification programs as a option, is a current managerial challenge, as it poses new involvement demands to managers and training promoters, the need for constant renewal of training materials and resources, due to high-paced knowledge erosion, and the systematic monitoring of individual, asynchronous skill adjustment efforts.

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