

Learning to Learn Assessment: The KC-ARCA Model

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KEYWORDS: *Learning to learn, Assessment, Key competences, Rubrics, Authentic tasks.*

Introduction

The present paper outlines a research-training process carried out with a sample of primary and lower secondary school teachers aimed at assessing the key competence of citizenship learning to learn (Asquini, 2016).

For this purpose, an assessment model was developed called KC-ARCA Model (Key Competences - Assessment, Rubrics, Certification of Achievement Model) which was tested in an exploratory way within the schools involved in the research.

The research-training group identified the competence of learning to learn as a sort of "core competence" able to develop learning and effective behaviours in several fields of action and study (OECD, 2002).

1. Theoretical framework: from the development to the assessment of competencies

In recent decades, the construct of competences has been one of the most innovative issues within the framework of the scholastic curriculum (Pellerey, 2010; Perrenoud, 2003; Rey, 2003). This process, which is still ongoing, has focused attention on the importance of learning outcomes rather than on contents and disciplines, emphasizing not the teaching process, but rather learning gained by the students (Maccario, 2012).

These changes have had an impact not only on curricular design, but also on teaching methods, teaching organization and evaluation (Trincherò, 2012). Therefore, at a purely didactic level, it is necessary to use a variety of assessment tools able to detect not only thanks to a solid knowledge base but also the ability to apply it in real problematic situations. The aim should be to construct tools capable of detecting transversal skills such as problem analysis and problem solving, learning how to learn and reflecting on one's own experiences, exploiting the past ones to be able to experiment in new fields of action (Vannini, 2009). It is assumed to be a kind of assessment which focuses on both of solving problem processes and the products, and considers both the individual dimension of learning but also the ability to work effectively and cooperatively with others to achieve common goals, molded as an external evaluation tool, but which is also able to develop students' self-assessment and self-regulation, improving the teacher's feedback (Lucisano and Corsini, 2015).

Referring to the studies related to the issue, the theoretical model that inspired this research is "Authentic Assessment" which aims at developing multi-dimensional methods of assessment able to overcome the rigidity sometimes attributed to the testing assessment (McClelland, 1994; Gardner, 1992; Glaser

and Resnick, 1989). In this case, the task of assessment is really intended to measure learning, but to provide information on the processes that generate learning and how the knowledge acquired is put into practice through effective behaviours inside and outside the school. Authentic assessment focuses on how the student builds up his/her own personal learning operating actively in different situations, rather than on standardization of the results. In so doing, it can also promote a new way of thinking of the assessment processes inside the school, referring to direct forms of performance assessment: authentic assessment doesn't assume any predictive or projective function, but evaluates the action produced directly in the field. Learning is seen as a product of contextualized knowledge accordingly, transferable in similar situations of use (*near transfer*) (Worthen, 1992; Chase, 1999; Wiggins, 1990).

Authentic assessment aims to provide feedback on products and processes of learning and allows to collect information related to the capacity of critical thinking, problem solving, metacognition, working efficiency and reasoning (Arter and Bond, 1996) which are at the basis of learning how to learn competence. In order to obtain such results, it is necessary to use specific tools capable of going beyond the detection of accurate knowledge and describing the quality of the behaviours implemented in problematic situations we are not aware of. In this case, referring to the evaluation sections may be useful (Goodrich, 1996; Capperucci, 2016). To be able to detect the levels with which a child or young person can perform a performance, it is however necessary to create real or simulated situations to work concretely for solving significant problems, both operational and intellectual. In this case it is useful to refer to the so-called "authentic tasks" or "reality tasks" (Darling-Hammond, 1994).

An authentic task requires the use of internal capabilities and knowledge, skills and competencies that students have learned at school or in other non-formal/informal educational contexts. Authentic assessment is therefore founded on the belief that academic achievements are not given by the accumulation of knowledge base, but are based on the ability to generalize, modeling, identifying relationships, transfer the acquired knowledge in real contexts. In this sense, assessment and certification of achievements are closely related to highlight how students' knowledge has generated competences that can be used effectively in multiple contexts and learning situations (Hart, 1994). Also in this case, the competence of learning to learn can provide a fundamental contribution to the development of higher cognitive functions, such as reflection, analysis, meta-reflection, the formulation of questions and hypotheses, the formation of critical thinking and the argumentative one, necessary both in the study and in life contexts (Bennett, Jenkins, Persky and Weiss, 2003).

2. The in-field research

2.1 Research context

Over the last few decades within the Italian school system, the issue of competences has been supported by several regulatory measures (Capperucci, Franceschini, Guerin and Perticone, 2016). Considering the most recent ones, an important contribution was provided by the National Guidelines for the 2007 and 2012 curriculum (MIUR, 2012), as well as by decree n. 139 of 22 August 2007 which clearly indicated the key competences of citizenship to be developed in the course of compulsory education (see Appendix n. 2), recalling those

provided for by the European Recommendation on key competences for lifelong learning of 2006, as updated in 2018.

As regards the assessment of competencies, the Italian Ministry of Education has elaborated a national experimental document of assessment and certification of achievement that will gradually be extended to all primary and lower secondary schools (see Act no. 3, February 13, 2015 and Decree no. 742, October 3, 2017). The ministerial acts stated that the certificate of achievements is issued by the school at the end of the fifth grade of primary school and the end of the third grade of lower secondary school. It is delivered to the student's family and to the subsequent school or vocational training center. In this way, the step-by-step developmental and unifying nature of the first cycle of education is emphasized, assigning to the certification of achievement the function of promoting the continuity between different grades of schools and supporting students' efforts towards the attainment of school or vocational qualifications.

The achievements to certify are those described in the Student Profile of the national core curriculum (MIUR, 2012). They are referred both to disciplinary skills and key competences of citizenship, many of which are based primarily on learning how to learn.

The KC-ARCA Model was designed to respond to the need of schools to plan shared assessment tools that can evaluate a complex competence such as learning to learn.

2.2 Research methodology: objectives, questions, phases, instruments

The present research comes from the need of schools to develop a model for assessing the key competence of citizenship learning to learn, in order to consider the evolution in a perspective of continuity between primary and lower secondary school.

The research objectives were:

1. choose and/or build assessment tools to learn how to learn competences that are valid and reliable within the sample schools;
2. contribute to the professional development of teachers regarding the assessment of competences.

The research question was how to develop a methodological model that can support teachers in the assessment of learning to learn, so that it can be recognized in subsequent grades of schooling.

The research sample was represented by 7 schools in the province of Arezzo that established a network following a grant from the Regional Scholastic Office of Tuscany to carry out experiments for innovation and improvement of teaching. The research was attended by 52 teachers (29 from the primary school and 23 from the lower secondary school).

The research was conducted through the following phases:

1. setting up of the research-training group: 7 teachers in charge (1 per school), 3 researchers from the University of Florence and 1 delegate from USR Tuscany;
2. definition of the research design: sharing of the research methodology and of the tools to be used (rubrics and authentic tasks);

3. setting up of work groups aimed at constructing rubrics and authentic tasks on the competence of learning to learn;
4. peer review of the designed instruments;
5. socialization and dissemination of the evaluation tools designed within the schools involved in the training research project.

One of the activities that most involved the research group before the definition of the survey design was to identify a shared definition of the competence of learning to learn. We started from the analysis of some studies developed within two separate research paradigms: a) the cognitive psychology paradigm which considers the mechanisms used to assimilate the knowledge base, and b) the social cultural paradigm which is focused on the process of learning embedded in social context (Stringer et al., 2010). In these perspectives, learning to learn refers to the ability to access, gain, process and assimilate new knowledge and skills, followed by the ability to critically reflect on the purposes and aims of learning. The definition of learning to learn also contains numerous references to how learning to learn is embedded in social relationship and the social context, for example, it refers to group work, "seeking and making use of guidance" and building on "life experiences". For other authors it is a complex mix of dispositions, experiences, social relations, values, attitudes and beliefs that coalesce to shape the nature of an individual's engagement with any particular learning opportunity of individual students (Deakin Crick, Broadfoot and Claxton, 2004). Learning to learn has to be seen also as "the ability and willingness to adapt to novel tasks, activating one's commitment to thinking and the perspective of hope by means of maintaining one's cognitive and affective self-regulation in and of learning action" (Hautamäki et al., 2002, p. 39). It comprises various domains of skills and abilities that can be divided into cognitive skills and abilities, affective control skills and abilities, task acceptance (Hautamäki et al., 2002). Therefore, learning to learn is a process of discovery about learning. It involves a set of principles and skills which can help learners learn more effectively and so become learners for life. The belief that learning is learnable represents the core principle. It offers pupils an awareness about how they prefer to learn and their learning strengths, how they can motivate themselves and have the self-confidence to succeed, some of the specific strategies they can use, for example to improve their memory or make sense of complex information, some of the habits they should develop, such as reflecting on their learning so as to improve next time (Amalathas, 2007).

These studies were then compared with the provisions of the reference legislation and with the Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning (2006/962/EC) and Decree no. 139, August 22, 2007. In the first case

learning to learn is the ability to pursue and persist in learning, to organize one's own learning, including through effective management of time and information, both individually and in groups. This competence includes awareness of one's learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully. This competence means gaining, processing and assimilating new knowledge and skills as well as seeking and making use of guidance. Learning to learn engages learners to build on prior learning and life experiences in order to use and apply knowledge and skills in a variety of contexts: at home, at work, in education and training. Motivation and confidence are crucial to an individual's competence.

The national legislation has adopted and adapted these indications identifying in learning to learn the ability to perform different actions, namely: “organizing one's own learning, identifying, choosing and using various sources and various information methods and of training (formal, non-formal and informal), also as a function of the time available, of one's own strategies and of one's method of study and work” (Decree no. 139, August, 22, 2007).

In view of the breadth of the processes underlying a complex competence and referring to McCormick's studies (2006), the research group decided to break down the competence of learning to learn in specific indicators easier to be considered in the construction of specific rubrics and authentic tasks. For the primary school education the competence has been made to coincide with the ability to: 1. self-evaluation; 2. identification and selection of information; 3. use of information and acquisition of a study method; and 4. organization of school-work.

3. Research products and results

Having established a shared definition of the competence of learning to learn, vertical work groups, made up of teachers of primary and lower secondary school have been set up for each indicator, so as to proceed to the construction of the instruments to evaluate it (rubrics and authentic tasks).

In a second step in order to share the tools and verify their reliability both internally and transversely to the various labor groups, peer review groups were set up with the task of revising the products fostering the triangulation of points of contact between teacher and researchers.

3.1 Setting up assessment rubrics

The assessment rubrics were designed to highlight the progression of the indicator considered in the different classes of primary and lower secondary schools (Danielson and Hansen, 1999). The descriptors identified have been considered as flexible reference to guide both the didactic planning for parallel classes and the assessment of the results at the end of each year. In *Tables 1, 2 and 3* show some examples of competence descriptors for primary and lower secondary school classes referring to the following indicators: “Identification and selection of information”, “Acquisition of the study method”, “Self-assessment”.

TABLE. 1. *Assessment rubric of “Identification and selection of information” in primary and lower secondary school*

	1st Class	2nd Class	3rd Class	4th Class	5th Class
Competence descriptors	The pupil understands the global meaning of a message or a story	The pupil understands the global and partial meaning of a message or a story The pupil can identify and establish the sequence of the main information of a message or a story	The pupil understands the global and partial meaning of a message or a story The pupil can identify and establish the sequence of the main information of a message or a story The pupil identifies useful and accessory information	The pupil understands the global and partial meaning of a message or a story The pupil can identify and establish the sequence of the main information of a message or a story The pupil identifies useful and accessory information The pupil makes a distinction between direct and indirect sources	The pupil understands the global and partial meaning of a message or a story The pupil can identify and establish the sequence of the main information of a message or a story The pupil identifies useful and accessory information The pupil uses the sources to retrieve information, make judgments and decisions, motivating his choice

	1st Class	2nd Class	3rd Class
Competence descriptors	The student uses the sources analytically to retrieve information, make judgments and make decisions, motivating his choice	The student uses and independently chooses the sources to obtain information and uses them in a knowledgeable way	The student uses and chooses the sources in an autonomous, responsible and critical way to retrieve information and re-elaborate it in a knowledgeable and personal way

TABLE. 2. Assessment rubric of “Acquisition of the study method” in primary and lower secondary school

	1st Class	2nd Class	3rd Class	4th Class	5th Class
Competence descriptors	The pupil masters the basic skills	The pupil consolidates and uses the basic skills	The pupil uses the basic skills and the information retrieved to reflect and asks questions The pupil expands learning strategies	The pupil uses the basic skills and the information retrieved to reflect and asks questions The pupil expands and uses learning strategies	The pupil uses the basic skills and the information retrieved to reflect and asks questions The pupil discriminates, chooses and uses the most effective learning strategies

	1st Class	2nd Class	3rd Class
Competence descriptors	The student employs diversified learning procedures useful for the development of essential knowledge	The student uses diversified learning procedures useful for the development of knowledge through the method of analysis and synthesis	The student elaborates the contents in a personal and critical way, using the skills acquired in the various disciplinary contexts

TABLE. 3. Assessment rubric of “Self-assessment” in primary and lower secondary school

	1st Class	2nd Class	3rd Class	4th Class	5th Class
Competence descriptors	<p>The pupil can ask for help</p> <p>If guided, the pupil recognizes the outcome of his work at a global level</p>	<p>The pupil recognizes and communicates the difficulties encountered</p> <p>If guided, the pupil uses error recognition and self-correction strategies</p>	<p>The pupil recognizes and communicates the difficulties encountered, talking about his own work</p> <p>The pupil in a mostly autonomous way uses (sometimes asking for help) error recognition and self-correction strategies</p> <p>The pupil identifies new learning</p>	<p>The pupil recognizes and communicates the difficulties encountered, talking about his own work</p> <p>The pupil in a mostly autonomous way uses error recognition and self-correction strategies</p> <p>The pupil identifies new learning</p>	<p>The pupil motivates his/her own work</p> <p>The pupil uses autonomously error recognition and self-correction strategies</p> <p>The pupil identifies new learning and can use it in new context</p> <p>The pupil identifies, by describing them, the main strengths and weaknesses of the task performed, proposing possible procedural and executive alternatives</p>

	1 st Class	2 nd Class	3 rd Class
Competence descriptors	<p>The student explains his own work</p> <p>The student recognizes his own weaknesses and, if guided, knows how to use his own strengths</p> <p>The student autonomously uses strategies to recognize errors</p>	<p>The student explains and analyses his own work autonomously</p> <p>The student recognizes his own weaknesses and, if guided, knows how to use his own strengths to face a task autonomously</p> <p>The student autonomously uses error recognition and self-correction strategies</p> <p>The student chooses the most effective learning strategies</p>	<p>The student motivates his work in a knowledgeable way</p> <p>The student is aware of his weaknesses and can use strategies to deal with difficulties</p> <p>The student autonomously and consciously uses error recognition and self-correction strategies</p> <p>The student chooses the most effective learning strategies</p> <p>The student identifies new learning and knows how to apply it in new contexts</p>

3.2. Planning authentic tasks

According to Authentic Assessment theories (Archibald and Newman, 1988; Shepard, 1991; Stiggins, 1994; Gredler, 1999) it is necessary to consider the construction of specific reality tasks for the assessment of competences. A reality task: 1. Is based on real tasks and not on evidence which have a predictive value; 2. requires judgment and innovation, as it leads to the solution of problems that may have more than one right answer or multiple ways of solving the problems; 3. asks the student to participate in the construction of knowledge, identifying, recognizing and processing the main structures of the subjects; 4. requires the effective use of a *repertoire* of knowledge and functional skills to deal with complex tasks; not just to show the amount and extent of knowledge, skills and competences acquired, but to highlight the plasticity, integration, connectivity of knowledge among them and the surrounding reality; 5. gives the opportunity to select, repeat, test pattern of action, check resources, get feedback and improve performance by increasing levels of *mastery* (Wiggins, 1993).

Some authentic tasks designed for the assessment of the indicators of the competence learning to learn are exemplified below (*Table 4* and *5*) and they are declined in the rubrics illustrated in the previous paragraph.

TABLE. 4. *Authentic task 1 - indicator “Acquisition of the study method” in primary and lower secondary school*

<i>Competence</i>	Learning to learn
<i>Indicator</i>	Acquisition of the study method
<i>Authentic task typology</i>	In small group work create a printed and / or multimedia brochure for the exit in the historical center of the city and / or of the territory
<i>Recipients</i>	5th grade primary school class – 1st grade lower secondary class
<i>Activities</i>	a. collection of information through different sources (paper, multimedia, oral); b. selection of the sources based on the functionality and type of information; c. definition of diversified tasks and completion times among group members; d. selection, synthesis, individual and collective processing of information; e. production of a written and / or graphic report (also in multi-media format) (brochure); f. presentation to the class of each work; g. role playing: simulation of a tour guide for classmates and teachers; h. analysis in the small group and (later) at the class level of the strengths and weaknesses of the products (brochure and simulation)
<i>Products</i>	Paper and / or multimedia brochures; simulation of a tourist guide

TABLE. 5. *Authentic task 2 - indicator “Self-assessment” in primary and lower secondary school*

<i>Competence</i>	Learning to learn
<i>Indicator</i>	Self-assessment
<i>Authentic task typology</i>	Self-assessment questionnaire or cognitive biography related to the realization of an individual and / or collective task
<i>Recipients</i>	5th pgrade rimary school class – 1st grade lower secondary class
<i>Activities</i>	<p>Compilation of a questionnaire or construction of a cognitive biography</p> <p><i>“Answer the following questions. When requested, indicate how satisfied you are with your job (not satisfies, not very satisfied, quite satisfied, very much satisfied, delighted with)</i></p> <p><i>Was the task you have just realised difficult/easy? Explain the reason why</i></p> <p><i>Did you encounter any difficulties during the realization of the task? If yes, what were they? How did you solve them? Did you need to ask for help? Were the aids provided useful?</i></p> <p><i>What were the mistakes you made? Were you able to correct them? If yes, how?</i></p> <p><i>How and what would you improve on the final product?</i></p> <p><i>What do you like most about the work you have done? What least?</i></p> <p><i>What did you learn anew?</i></p> <p><i>How could you reuse what you've learned?</i></p>

	<p><i>What did you like most about working on the task that was proposed to you? What less?</i></p> <p><i>How did you feel during the entire performance of the task (at the beginning, during, at the end)?</i></p> <p><i>(in case of group work) Did you collaborate easily in solving the task? How did you set up the work at the beginning of the task? ... and how did you finish it?</i></p> <p><i>What choices did you make during the task?</i></p> <p><i>Were there any reasons for dispute among you?</i></p> <p><i>If yes, how did you overcome them (or were they not exceeded)</i></p> <p><i>Would you like to be engaged in a similar task again?"</i></p>
<i>Products</i>	questionnaire / cognitive biography and analysis of the answers

3.3. Research group internal validation of the products

Once the planning of the assessment rubrics and of the authentic tasks was completed, the reliability and the degree of sharing among the participants in the research-training course was verified.

The following aspects were considered:

1. clarity and progression of the descriptors of the assessment rubrics;
2. the ability of the rubrics to discriminate qualitatively different behaviours with reference to the criteria of complexity, accuracy, extent, transferability of the expected actions;
3. validity and consistency of the descriptors of the rubrics with the types of authentic tasks proposed;
4. sustainability and viability of the designed authentic tasks.

To this end, a process of triangulation relating to the products and to the teachers' and researchers' point of views has been set up through peer review (Bonaccorsi, 2012; Sluijsmans, Brand-Gruwel, van Merriënboer and Martens, 2004).

Conclusions

Learning to learn assessment is an ambitious challenge due to the breadth and complexity of this competence. However, within learning processes and in scholastic contexts, it is so relevant that didactic research cannot avoid trying to investigate its constitutive aspects through survey tools built together with schools and teachers.

Despite the limits linked to the narrowness of the reference sample, the KC-ARCA model has set itself this priority objective and has represented a pilot project capable of stimulating the teachers to build new docimological tools and to a critical and more aware use of the rubrics and authentic tasks; the didactic research is working intensively to increase the degree of validity and reliability of such tools (McTighe and Wiggins, 2004).

The added value of the research-training experience linked to the KC-ARCA model lies precisely in having broadened the range of teachers' assessment skills, looking beyond the fence of knowledge and disciplinary skills, to project

itself towards more inaccessible and little known paths such as those related to the development of transversal skills and learning to learn. The limits of the present research depend not only on the narrowness of the sample, but also on the external validity and the generalizability of the results that instruments such as those examined here are able to provide, but which are important since they may become heuristic devices able to widen the knowledge on the ways of competences construction and on how to evaluate their acquisition starting from the school context.

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Il contributo è stato ideato congiuntamente dagli autori che hanno condiviso il modello teorico di riferimento e la metodologia di ricerca. Sul piano della scrittura, gli autori hanno elaborato le diverse sezioni così come di seguito specificato: Davide Capperucci ha scritto i paragrafi 1 e 2, e i relativi sottoparagrafi; Ilaria Salvadori ha scritto il paragrafo 3, e i relativi sottoparagrafi. L'Introduzione, le Conclusioni e i Riferimenti bibliografici sono stati scritti da entrambi gli autori.