

# UNE 71362, a standard to guide, improve, and assess the quality of digital educational materials

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The UNE 71362:2017 standard provides a baseline model to define and assess, both quantitatively and qualitatively, the quality of digital educational materials. Teaching and learning, technology, accessibility, and educational experts from the three sectors involved in the creation and use of these materials - academic, business, and public administrations - have taken part in the creation of the standard. The purpose of the standard is to meet the challenge and cover the need for quality assessment systems that guide producers in the creation of digital educational materials, the users who select them, and evaluators in their assessment.

## Introduction

The fact that a piece of digital educational materials is of *quality* means that it is able to meet users' needs, which in turn means, in the field of virtual education, or e-learning, it is effective from the didactic, technological, and accessibility points of view. *Didactic effectiveness*, in this regard, means that the materials actually help or facilitate teaching for teachers and learning for students – that is, when the materials are used, good academic results are obtained with reasonable teacher or student dedication and effort. As for *technological effectiveness*, it means that the usability, durability, robustness when faced with failures or errors, portability, and interoperability of the materials are also reasonably good. In this way, it is ensured that use of the digital educational materials by the user will be simple, reliable, and transparent as regards the underlying technology. In addition, the cost of digital educational materials can be capitalised by increasing the time and possibilities for use (and re-use). Finally, the *accessibility efficiency* refers to the ease with which any individual, with or without disabilities, can access and use the digital educational materials.

Being able to *evaluate the quality* of digital educational materials is a key issue to ensure quality education. Educational materials constitute one of the bases for teaching and learning [1: page18]. However, so far, there is no basic agreement to create and assess these materials despite the need for it. The 2012 OECD and UNESCO reports on the situation of Open Education Resources (OERs) states that one of the main challenges for this kind of education resources is OER quality [2][3]. In a subsequent 2015 report, OECD continues to point out that the development of an evaluation system for digital educational material quality is a priority [4]. In addition, in the private sector, ANELE (the Spanish National Association of Book and Teaching Materials Publishers) laments, in its report of 30 August 2016 [5] that, despite the strong investment made by publishing houses in quality digital books, their use is not widespread. Among other reasons, ANELE points out the general lack of confidence in digital textbooks "[...] as key creative works for teaching" as well as to competition among the producers of educational materials with no quality framework to distinguish among them. In short, when is digital educational material of sufficient quality?

## The quality model and assessment tool

The UNE 71632 standard proposes answering this question by quantitatively and qualitatively assessing the degree of compliance with fifteen quality criteria. Each criterion, in turn, is assessed on the basis of a series of quality indicators that are scored (figure 1). The standard also provides a rubric to guide this score and a series of guidelines in the informative annexes, to help assess what can be more complicated aspects such as the verification of compliance with intellectual property (Appendix G), procedures for applying the standard in quality assessment (Appendix E), and assessing the variety of learning styles and strategies used in a material (Appendix H).

ANEXO A (NORMATIVO)			
MODELO DE HERRAMIENTA			
A.1 – Herramienta para la evaluación de la calidad de MED			
CRITERIOS/ÍTEM	DESCRIPCIÓN DEL CRITERIO Y ORIENTACIONES PARA LA PUNTUACIÓN MÁXIMA DE LOS ÍTEM	NIVEL DE EXIGENCIA: Mínimo (M) o Excelente (E)	PUNTAJE
1. Descripción didáctica: valor y coherencia didáctica	Este criterio valora si se han definido y son coherentes los objetivos didácticos (que se aprenda con el material educativo digital), los destinatarios (a quién va dirigido), los docentes y alumnos (qué habilidad va a mejorar el alumno) y el factor supervisor de explotación didáctica (instrucción de uso) para el profesor y/o para el alumno.	M	
1.1. Los objetivos didácticos se especifican de manera clara y precisa en el MED	Al profesor o al alumno se muestran claros los objetivos didácticos (qué enseñar y qué aprender).	M	
1.2. Se especifican los destinatarios, los objetivos didácticos son alcanzables por los destinatarios según el perfil requerido en el propio MED	(1) Se indica con qué se los destinatarios del MED (por ejemplo, la edad y/o nivel educativo recomendado); (2) Los destinatarios tienen un nivel educativo, edad y capacidad de aprendizaje adecuada y suficiente para la consecución de los objetivos didácticos propuestos; (3) Se indica si el material educativo digital ha sido preparado para ser utilizado por docentes, alumnos o conjuntos de alumnos, por ejemplo, alumnos con distinto nivel de conocimiento inicial, alumnos de diferente procedencia socio-cultural-lingüística, alumnos con diferentes estilos de aprendizaje.	M	
1.3. Las competencias y/o destrezas a desarrollar están claramente especificadas, son coherentes con los objetivos y los destinatarios	Se indican las competencias clave que se pueden alcanzar y destrezas que se pueden desarrollar. Para valora su coherencia se aconseja comparar si existe correspondencia con el "currículo escolar académico mínimo" donde se definen los objetivos, las competencias y/o las destrezas. El currículo escolar académico mínimo está definido por el Ministerio de Educación (currículo o acreditación mínima). En el caso de que no exista definido un currículo se muestra en...	E	
1.4. Existen instrucciones o sugerencias sobre los posibles usos didácticos para el profesor y/o para el estudiante (autoformación)	Se indica si el profesor o el alumno tenga alguna recomendación previa para la explotación del material y cuál es en su caso.	E	
1.5. Se indica el tiempo estimado de aprendizaje	El MED indica el tiempo (mínimo-máximo) de tiempo estimado de trabajo del estudiante para alcanzar los objetivos didácticos.	E	
1.6. Se indican los conocimientos previos del destinatario	Se indica si es necesario que el alumno tenga algún conocimiento previo para la explotación del material y cuál es en su caso.	E	
<b>TOTAL CRITERIO 1</b>		<b>MÍNIMOS</b>	<b>TOTAL</b>
<b>(Mínimo sobre 2 y Total sobre 6)</b>			<b>NÚMERO DE ÍTEM NO APLICABLES</b>
<b>2. Calidad de los contenidos</b>			
<b>2.1. Calidad de los contenidos</b>			
2.1. El contenido es coherente con los objetivos didácticos	Este criterio se centra en evaluar el contenido del material educativo digital. El contenido puede estar en su sitio web o en un video o incluso, otros material educativo digital. Se debe valorar la pertinencia del contenido, que debe ser adecuado al nivel de conocimiento del alumno y coherente con los objetivos, la naturaleza y grado de interacción del contenido, o el respeto a los derechos de autor.	M	
2.2. El contenido se presenta de manera clara y comprensible. Se destacan las ideas clave y se dan instrucciones claras en las actividades	Cada objetivo didáctico se trabaja con, al menos, un contenido didáctico y una actividad que sea coherente y pertinente.	M	
2.3. Las ideas y conceptos se presentan en número adecuado y ordenado y equilibradamente a lo largo del MED	El tiempo utilizado es comprensible para los destinatarios. La presentación de los contenidos será bien organizada y sigue una sucesión lógica. Se localizan fácilmente las ideas clave. Se evitan actividades las instrucciones con ideas y se anticipan.	E	
2.4. El contenido es confiablemente correcto, no presenta sesgo ideológico, ni objetivo y contiene información veraz	1. Las ideas están claramente distribuidas en el contenido. Existen un bloque de contenido distinguible por cada concepto presentado. Por ejemplo, en el caso de contenidos textuales existe un párrafo o apartado independiente por cada idea tratada. 2. Las ideas se distribuyen equilibradamente en el contenido. No existe fragmento con muchas ideas y otros con pocas. La densidad de ideas es constante en todo el contenido. 3. La información es coherente. Las ideas se enlazan mediante o van coherencia entre ellas.	M	

Figure 1. The quality assessment tool (Annex A of the standard)

The six first criteria of the quality model and tool measure, fundamentally, the didactic effectiveness of the materials; the following four criteria measure technological effectiveness; and, finally, the last five, the effectiveness with regard to accessibility:

- (1) Didactic description: didactic value and didactic coherence
- (2) Quality of the contents
- (3) Ability to generate learning
- (4) Adaptability
- (5) Interactivity
- (6) Motivation
- (7) Format and design
- (8) Reusability
- (9) Portability
- (10) Robustness; technical stability
- (11) Structure of the learning scenario
- (12) Navigation
- (13) Operability
- (14) Accessibility of audiovisual content
- (15) Accessibility of text content

It should be noted, however, that the boundaries between these three aspects of quality are not defined (figure 2). Thus, certain criteria for an aspect (e.g. the second didactic criterion) need, for its fulfillment, to verify indicators of other aspects (e.g. accessibility indicator 2.2).

This overlap among the three quality aspects is really innovative, and is yet another indicator of the difficulty (and cost) of creating effective and cost-effective digital learning materials in digital learning environments.

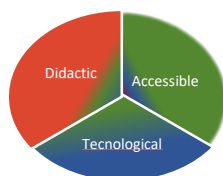


Figure 2. Overlap of the quality aspects

Regarding the accessibility criteria, it is worth highlighting the novel treatment given to them in the standard: they are not only a mandatory requirement to ensure that everyone can use the material, but above all, they are a guarantee that the digital educational material will be effective didactically and technologically. This means that accessible material will reduce the effort of receiving, understanding and assimilating its contents, which, in short, facilitates learning for anyone, with or without disabilities. In this sense, the standard integrates the guidelines prepared by ONCE and the UNE 139802:2009 - Software accessibility requirements and UNE 139803:2012 - Online contents accessibility requirements standards. Appendix D to the standard specifies how this integration has been carried out.

It is also worth noting the particular concern that the standard has had to be as usable as possible. In this regard, Appendix F provides two adaptations of the quality assessment tool to the teacher and student profiles. These profiles take into account teachers who are not specialists in technology or accessibility, and students who are not specialists in didactics. These profiles are useful to guide a self-assessment of the educational materials that is created or selected for a training action, and are even useful to conduct surveys among teachers and students on the quality of the materials they use.

Finally, it should be borne in mind that the standard has been evaluated with respect to its effectiveness (does the quality of materials really improve when it is applied?), usability (is it easy to use and understand?), and reliability (is there a sufficient degree of agreement on the assessments made by different evaluators of the same materials?) The evaluation experiments and their results, as well as the methodology for the implementation of the standard, are described in Appendix B. In addition, Appendix C summarises the fifty-six national and international quality models, which formed the basis for the first version of the quality model of the standard.

### **Conclusions and future work**

To conclude, this standard provides a reference for the quality of digital educational materials, including an assessment model and tool that define the basis to evaluate quality. The ultimate goal of the standard is to facilitate and promote the creation, improvement, and selection of high-quality digital educational materials.

In this regard, having a quality standard for digital educational materials will not prevent the author/developer from having to invest a significant effort in learning the didactic, technological and accessibility requirements that are currently scattered and difficult to

understand in order to create quality educational material. However, having a document that systematically, comprehensively and measurably gathers these basic requirements will considerably facilitate both the initial process of digital learning material training [6] and the design of processes for creating, updating, reusing, and evaluating quality of digital educational materials.

The quality standard UNE 71632 also complements the global e-learning quality certification systems of schools and educational institutions such as the ECB Check e-learning Quality certificate [7] or the Spanish UNE 66181:2012 "Quality management standard. Quality of virtual training".

Regarding future work, the standard indicates that, in its current format, the quality model is a "minimum" model on which work should continue to be done along three lines: (1) adjusting the model, if necessary, as more experience of use is gradually acquired; (2) completing it with new criteria of proven validity, reliability and consensus; and (3) adapting it when the future new didactic and technological contexts make it necessary.

### **Bibliography**

- [1] EFQUEL (2011). UNIQUE information Package. Available at: <https://www.efmd.org/projects-test?download=6:06-unique-guidelines-2011&start=10> (retrieved on 15/07/2017)
- [2] Hylén, J.; Van Damme, D.; Mulder, F.; D'Antoni, S. (2012) Open Educational Resources: Analysis of responses to the OECD Country Questionnaire. EDU Working Paper 76. Organisation for Economic Co-operation and Development (OECD). Available at: [http://search.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP\(2012\)13&docLanguage=En](http://search.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP(2012)13&docLanguage=En) (consulta realizada 15/07/2017)
- [3] Sarah Hoosen of Neil Butcher & Associates (2012). Survey on Governments' Open Educational Resources (OER) Policies. Commonwealth of Learning and UNESCO. Available at: [http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/themes/Survey\\_On\\_Government\\_OER\\_Policies.pdf](http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/themes/Survey_On_Government_OER_Policies.pdf) (consulta realizada 15/07/2017)
- [4] Orr, D., M. Rimini and D. Van Damme (2015), Open Educational Resources: A Catalyst for Innovation, Educational Research and Innovation, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264247543-en> (retrieved on 15/07/2017)
- [5] ANELE (2016) Informe sobre la evolución de los precios de los libros de texto. Available at: <http://anele.org/wp-content/uploads/2011/05/INFORME-EVOLUCI%C3%93N-PRECIOS-ANELE-2015-2016.pdf> (consulta realizada 15/07/2017)
- [6] ANECA. (2008). Programa ACADEMIA. Principios y orientaciones para la aplicación de los criterios de evaluación. Agencia Nacional de Evaluación de la Calidad y Acreditación, Ministerio de Educación, Cultura y Deporte, Informe Técnico V.2.0.31/01/2008. Available: [http://www.aneca.es/content/download/10527/118089/version/1/file/academia\\_14\\_ppiosyorientaciones.pdf](http://www.aneca.es/content/download/10527/118089/version/1/file/academia_14_ppiosyorientaciones.pdf) (retrieved on 15/07/2017)
- [7] ECBCheck. (2012). OpenECBCheck Quality Criteria. Available: <http://efquel.org/certificates/ecbcheck> (retrieved on 15/07/2017)