

Evaluation of Multimedia Resources for Croatian Language Learning in Primary Education

Zrinka Vukojević¹

University of Zagreb
Faculty of Teacher Education
Zagreb, Croatia
rogulj@gmail.com

Nataša Rogulja²

University of Zagreb
Faculty of Teacher Education
Zagreb, Croatia
natasa.rogulja@gmail.com

Abstract: This paper presents an evaluation of the online interactive multimedia educational resources from three prominent publishers in Croatia (PROFIL Klett, Alfa and Školska knjiga) that are offering additional digital contents for learning the Croatian language in primary schools. Evaluation criteria were applied in three areas: Croatian language and Communication, Literacy, and Culture and Media. Digital contents represent cognitive auxiliary tools and supplementary teaching and learning material and can have different modes of application in the teaching and learning process, depending on the teacher's methodical approach. Studies have shown that pupils have better achievements in content retention and comprehension if multimedia resources accommodate different learning styles (visual, aural, read/write, and kinesthetic) and follow fundamental multimedia instructional design principles (multimedia, spatial and temporal contiguity, coherence, modality, redundancy, signalling, animation and interactivity), in order to capture pupils' attention, reduce split-attention effect and cognitive load. The aim of the evaluation is to provide guidelines for the publishers and teachers in building an effective conceptual model for developing teaching and learning materials in accordance with relevant research in multimedia design and education. This should enable and contribute to a better understanding of the potential benefits and limitations of the multimedia design process with respect to existing and future digital contents.

Keywords— *digital content; instructional design; language learning; multimedia resources; primary education*

INTRODUCTION

Information and communication technology (ICT) is an indispensable part of everyday life and is present in all areas of human activity, including education. Today's students belong to Generation Z, a generation that is growing up with modern technologies and social media and can no longer imagine their lives without their use (Gomez et al., 2019). The specificity of Generation Z, school reform,

and the desire to modernise education and change it in line with the modern age are reasons for the increasing use of technology in learning and teaching.

The term ICT in education was introduced in 1997 when Dennis Stevenson emphasized increasing role of both information and communication technologies in education by adding "communications" to the known "information technology" (IT) (Stevenson, 1997). According to the European Digital Competence Framework, the terms Educational Digital Content (EDC) and Educational Digital Resources (EDR) in the teaching process refer to content delivered through specific educational technologies (Pavičić, 2017). Educational technology implies the use of technology to improve education, i.e., e-learning. E-learning refers to the active participation of students in the teaching process in order to achieve educational outcomes through the use of information and communication technology (ICT). Introducing new technologies into the teaching process requires new skills from students and teachers, but also a systematic reflection on teaching methods for new phenomena in education. Teaching should not be adapted to technology, but technology should be used to achieve educational outcomes as effectively as possible without neglecting basic methodological principles.

Teaching and learning Croatian is a great challenge, first of all, because of the complexity of the subject and then the diversity of the content (the relationship between language knowledge and the development of language skills, as well as the relationship between different areas of teaching: Croatian language and communication, literacy, culture and media). It is precisely because of this complexity and diversity of the content and outcomes of Croatian language teaching that the use of ICT in primary school lessons can be a great help in making lessons dynamic, engaging, interactive, personalised and effective.

The use of ICT in teaching has been recognised by various Croatian publishers of digital contents. Školska knjiga, one of the largest Croatian publishers, has launched a social platform called Školski Portal, with which they want to contribute to the progress of education through news from the school and digital world. In 2014, they were among

the first to launch textbooks with multimedia materials called “e-learn” and digital tools for preparing and conducting lessons called “e-manual”. Since 2018, a complete digital system of textbooks for the new era of teaching and learning has been introduced – e-sphere. Within the system, there are electronic textbooks tailored to the curriculum requirements of the subjects taught. In addition to the textbooks, additional digital educational content is available with each lesson and is geared towards achieving educational goals. Certain textbooks and additional digital teaching materials can be viewed by all users free of charge and without registration. For all other materials and additional tasks, registration information or codes found in the printed textbooks are required. Following the example of the textbook, two other prominent Croatian publishers, PROFIL Klett and Alfa, have also launched their portals, albeit exclusively with digital content.

Since three major publishers offer digital educational content, this article presents an evaluation of digital contents for learning Croatian in primary school. The aim of the assessment is to provide publishers and teachers with guidelines for building an effective conceptual model for the development of teaching and learning materials in line with relevant research in the field of multimedia design and education.

THEORITICAL FRAMEWORK

From the perspective of the cognitive theory of multimedia learning (Mayer 2009, 2014), digital content represents multimedia teaching messages (Mayer and Alexander, 2011), which consist of the simultaneous presentation of words and images. The term word includes spoken (narrative) and/or written text, and the term image includes a static image (e.g., illustration, diagram, photograph, etc.) and/or a moving image (e.g., animation, simulation, video recording, etc.).

The multimedia teaching message is designed to promote lasting change in individual knowledge by selecting, organising and integrating the content presented into a meaningful cognitive structure based on prior knowledge. According to the following theory, students learn better: (1) from content presented in words and pictures than from content presented only in words (multimedia principle); (2) when words and pictures are spatially integrated rather than spatially separated on the screen (principle of spatial contiguity); (3) from content where words and pictures are presented simultaneously rather than from content presented sequentially (principle of temporal contiguity); (4) from content where irrelevant words and pictures are excluded rather than included (principle of coherence); (5) from content with animation and spoken words (narration) than from content presented with animation and written words (modality principle); (6) from content with animation and spoken words (narration) than from content presented with animation, spoken words and written

words (redundancy principle); (7) when the display contains additional signals or signs that emphasise the organisational structure and content of the essential part of the message (signalling principle).

Modern textbooks should not only contain facts (but they should contain relevant facts) for the student to learn, but with digital methodological tools, students should be encouraged to investigate, question, think and draw conclusions with a stimulating methodological outline based on the principles of basic educational sciences, in accordance with the development of reading, maths, science, and ICT literacy.

Andraka (2020) consider the textbook an essential methodological metatext. However, materials in digital form (including digital textbooks) are the subject of current academic debate. Clearer guidelines for the design of digital content intended for students will help all those involved in the educational process: firstly, the authors of said materials, then their reviewers, the future teachers who will have to teach them methodically to students during lessons, the parents who help their children outside school, and the students who come into contact with this content. This should also be applied to digital textbooks. It must be scientifically discussed whether the authors of digital textbooks have all the necessary competencies required for the design of digital textbooks and whether the process of professional approval of these textbooks ensures the thoroughness and objectivity as well as the professional and/or scientific level of the methodological, didactic, psychological and other foundations of the content and methodological digital instrumentation.

A study (Čanić, 2017), in which N = 123 people participated (45 of them teachers), concluded that 42% of teachers use digital content on a daily basis, and most of them (42%) use this content for revision and practice.

EVALUATION CRITERIA

Educational digital content has become a mandatory part of the curriculum environment in the education system of the Republic of Croatia. Under these requirements, reputable publishers (PROFIL Klett, Školska knjiga, ALFA) have offered online interactive multimedia resources for learning the Croatian language in primary schools in three areas: *Croatian language and Communication, Literacy and Culture, and Media*. Although publishers refer to these resources as “digital textbooks”, there is still no clear terminological definition of a digital textbook in Croatia.

Digital textbooks from 1st to 4th grade of primary school that are evaluated in this paper are Trag u priči; Nina i Tiño, Pčelica; Zlatna vrata; Svijet riječi; Čitam i pišem; Škrinjica slova i riječi.

Aftermentioned digital textbooks are created and aligned with the curriculum requirements of the teaching subjects and standards prescribed by Ministry of Science and Education. The evaluation

process presented in this paper was not focused on the textbook material but on the adequate fulfilment of the multimedia digital educational resources criteria.

The additional digital contents were evaluated with the evaluation criteria previously developed by various prominent experts and researchers in the field of heuristic evaluation for e-learning programs (Nielsen, 1994, 2000; Reeves et al., 2002), theory of multimedia learning (Mayer, 2009, 2014), multimedia instructional design and evaluation (Lee and Owens, 2004; Mayer and Alexander, 2011) and evaluation of multimedia learning resources/materials (Al-Alwani, 2014; Aust and Isaacson, 2005; Leacock and Nesbit, 2007; Nesbit et al., 2002; Nesbit et al., 2009; Rice and Ortiz, 2021; Unić et al., 2012; Quality Assurance of Multimedia Learning Materials, 2010).

Evaluation criteria are grouped into six categories taken from Unić et al. (2012): (1) Usability; (2) Multimedia Incorporation; (3) Content Management; (4) Navigation; (5) Usefulness; (6) Learning Management.

Usability is a quality attribute related to functional accuracy (level of functionality of multimedia instructional material), perceptual efficiency (minimal cognitive effort invested to perceive the presented content), and technological efficiency (user-friendly interface – inputs, navigation, etc.; absence of technical errors; less computational resources for the content presentation) (Nielsen and Molich, 1990; Nielsen, 2003; Nielsen, 2005; Newby et al., 2006).

Multimedia Incorporation criteria refer to the structure evaluation of multimedia elements (spoken (narration) and/or written text, illustration, diagram, photograph, etc.) by observing principles and processes of cognitive theory of multimedia learning concerning the cognitive load and coherence (Lee and Owens, 2004; Mayer, 2009, 2014; Reeves et al., 2002).

Content Management criteria refer to the content presentation in the interactive multimedia educational resources by evaluating content organization, learning activities that meet all learning objectives presented clearly and understandably and its suitability for the developmental age of the pupil, with consideration of pupil progression, pupil abilities and learning styles (Croatian Academic and Research Network – CARNET, 2016; Quality Assurance of Multimedia Learning Materials, 2010).

Navigation criteria evaluate the appropriate consistency level in overall content design, interface quality (user-friendliness) and navigational structure (intuitive and innovative) of the interactive multimedia educational resources. It observes level of clarity, simplicity, and functionality in the presented table of contents, directions, and instructions on the screen; basic user control possibilities (audio and/or video content); consistency in using interactive elements; logical structure and clear instructions of learning activities, etc. (Al-Alwani, 2014; Croatian Academic and Research Network – CARNET, 2016; Lee and Owens, 2004; Quality Assurance of Multimedia

Learning Materials, 2010; Reeves et al., 2002; Rice and Ortiz, 2021).

Usefulness is related to methodical effectiveness, cognitive adequacy, and appeal (Unić et al., 2012). Useful interactive multimedia educational resources have learning activities aligned with methodological goals and objectives and provide motivational elements to capture interest and engage the pupil. They encourage question-answer problem-solving and promote multiple, complex responses (Al-Alwani, 2014; Croatian Academic and Research Network – CARNET, 2016; Lee and Owens, 2004; Reeves et al., 2002; Rice and Ortiz, 2021).

Learning Management criteria refers to assessing the pupil's learning progress and achievements by recording pupil performance data in the interactive multimedia educational resources, using a series of different quizzes, tests, matching, sorting, etc. in each section's content adequate to the pupil's learning level. It promotes higher-order assessments (e.g., analysis, synthesis, and evaluation) rather than lower-order assessments (e.g., recall and recognition) (Al-Alwani, 2014; Reeves et al., 2002).

METHODOLOGY

Research Questions and Hypothesis

The research question asked was – *do Croatian publishers for language learning in primary education fulfil all multimedia digital educational resources criteria?*

In accordance with the research question, the following hypotheses were formulated:

H1: Croatian publishers for language learning in primary education fulfil all multimedia digital educational resources criteria.

H1.1: Croatian publishers for language learning in primary education fulfil *Usability* criteria.

H1.2: Croatian publishers for language learning in primary education fulfil *Multimedia Incorporation* criteria.

H1.3: Croatian publishers for language learning in primary education fulfil *Content Management* criteria.

H1.4: Croatian publishers for language learning in primary education fulfil *Navigation* criteria.

H1.5: Croatian publishers for language learning in primary education fulfil *Usefulness* criteria.

H1.6: Croatian publishers for language learning in primary education fulfil *Learning Management* criteria.

Data Collection

Qualitative research was conducted to answer the research question and test the hypotheses by analysing 24 online additional digital contents for learning the Croatian language, from 1st to 4th grade of primary school, for three publishers: PROFIL Klett, Školska knjiga, and Alfa.

Instrument

The instrument used in the qualitative research was evaluation criteria instrument (explained

in chapter Evaluation Criteria) grouped into six categories with relevant questionnaires for each category. Evaluation criteria consisted of six questionnaires with a total of 120 items: (1) Usability (N=16); (2) Multimedia Incorporation (N=30); (3) Content Management (N=17); (4) Navigation (N=22); (5) Usefulness (N=24); (6) Learning Management (N=11).

Results

Table 1 shows the result for the fulfilment of Usability criteria in 24 additional digital contents from 1st to 4th grade.

The questionnaire used for qualitative analysis consisted of a total of 16 items. Sixteen digital contents (66,67%) did not fulfil the “button function” criteria, and all 24 (100%) digital contents did not meet the criteria regarding “help documentation” and “screen design” requirements (Table 1).

Table 1. The number of digital contents that do not fulfil Usability criteria

CRITERIA ITEMS	Freq. (%)
Simple identification of the button function.	16 (66,67%)
Readable and understandable help documentation available from any logical part of the digital educational content.	24 (100%)
Adequately ornate screen for the pupil to be able to perceive the important information.	24 (100%)
Freq. – digital contents (>= 12) that do not meet evaluation criteria.	

Table 2 shows the result for fulfilling Multimedia Incorporation criteria in 24 additional digital contents from 1st to 4th grade.

The questionnaire used for qualitative analysis consisted of a total of 30 items. Sixteen digital contents (66,67%) did not fulfil “appropriate learning design”, “graphics reinforcement of material”, and “sound effects application and attention attraction” criteria. All 24 (100%) digital contents did not fulfil the criteria regarding “clarity of all images and graphics” requirements (Table 2).

Table 2. The number of digital contents that do not fulfil Multimedia Incorporation criteria

CRITERIA ITEMS	Freq. (%)
Appropriate learning design to achieve its stated objectives (text, video, animation, music, narration, sound effects and special visual effects are effectively and appropriately used).	16 (66,67%)
Clarity of all images and graphics.	24 (100%)
Graphics reinforcement of material.	16 (66,67%)
Appropriate application of sound effects (attraction of the pupil's attention).	16 (66,67%)
Freq. – digital contents (>= 12) that do not meet evaluation criteria.	

Table 3 shows the result for the fulfilment of Content Management criteria in 24 additional digital contents from 1st to 4th grade.

The questionnaire used for qualitative analysis consisted of a total of 17 items. All 24 (100%) digital contents did not fulfil criteria regarding “possibility of group use”, “methodical presentation of content and learning activities”, “program consideration of pupil progression”, “encouragement toward a higher level of learning”, and “promotion of higher level of learning” requirements (Table 3).

Table 3. The number of digital contents that do not fulfil Content Management criteria

CRITERIA ITEMS	Freq. (%)
Possibility of group use.	24 (100%)
Methodical presentation of content and learning activities – from closer to further, from simple to complex, from easier to more difficult, from concrete to abstract.	24 (100%)
Program consideration of pupil progression (provision of different activities or perturbations depending on the pupil's performance).	24 (100%)
Encouragement toward a higher level of learning through learning activities that meet all objectives.	24 (100%)
Promotion of a higher level of learning through creatively sequenced learning activities.	24 (100%)
Freq. – digital contents (>= 12) that do not meet evaluation criteria.	

Table 4 shows the result for the fulfilment of Navigation criteria in 24 additional digital contents from 1st to 4th grade.

The questionnaire used for qualitative analysis consisted of a total of 22 items. Sixteen digital contents (66,67%) did not fulfil “no interference of extensive consultation of a manual or other documentation while learning” and “intuitive and innovative navigation” criteria. All 24 (100%) digital contents did not fulfil the criteria regarding “simple use of the home page and navigation” and “manageable navigation structure” requirements (Table 4).

Table 4. The number of digital contents that do not fulfil Navigation criteria

CRITERIA ITEMS	Freq. (%)
No interference of extensive consultation of a manual or other documentation while learning.	16 (66,67%)
Intuitive and innovative navigation.	16 (66,67%)
Simple use of the home page.	24 (100%)
Simple use of navigation tools.	24 (100%)
Manageable navigation structure.	24 (100%)
Freq. – digital contents (>= 12) that do not meet evaluation criteria.	

Table 5 shows the result for the fulfilment of *Usefulness* criteria in 24 additional digital contents from 1st to 4th grade.

The questionnaire used for qualitative analysis consisted of a total of 24 items. Sixteen digital contents (66,67%) did not fulfil the “offering of complex feedback (e.g., performance assessment, item analysis)” criteria. All 24 (100%) digital contents did not fulfil the criteria regarding “encouragement of question-answer problem solving”, “promotion of multiple, complex responses (problem-solving tasks), instead of simple “canned answers”, and “presence of virtual tutor” requirements (Table 5).

Table 5. The number of digital contents that do not fulfil Usefulness criteria

CRITERIA ITEMS	Freq. (%)
Encouragement of question-answer problem solving.	24 (100%)
Promotion of multiple, complex responses (problem-solving tasks) instead of simple “canned answers”.	24 (100%)
Offering complex feedback (e.g., performance assessment, item analysis).	16 (66,67%)
Presence of virtual tutor.	24 (100%)
Freq. – digital contents (>= 12) that do not meet evaluation criteria.	

Table 6 shows the result for the fulfilment of *Learning Management* criteria in 24 additional digital contents, from 1st to 4th grade.

The questionnaire used for qualitative analysis consisted of a total of 11 items. Sixteen digital contents (66,67%) did not fulfil the “provision of sufficient feedback for possible remedial directions, with respect to the content” criteria. All 24 (100%) digital contents did not fulfil criteria regarding “variety of assessment tools (user-friendly interface)”, “provision of opportunities for self-assessments that advance pupil achievement, with respect to the content”, “necessity of mastery of each section’s content (program prerequisite) before proceeding to the next section”, and “provision of higher order assessments (e.g., analysis, synthesis, and evaluation) rather than lower order assessments (e.g., recall and recognition), when appropriate” requirements (Table 6).

Table 6. The number of digital contents that do not fulfil Learning Management criteria

CRITERIA ITEMS	Freq. (%)
Variety of assessment tools (user-friendly interface).	24 (100%)
Provision of sufficient feedback for possible remedial directions with respect to the content.	16 (66,67%)
Provision of opportunities for self-assessments that advance pupil achievement with respect to the content.	24 (100%)
Necessity of mastery of each section’s content (program prerequisite) before proceeding to the next section.	24 (100%)

Provision of higher order assessments (e.g., analysis, synthesis, and evaluation) rather than lower order assessments (e.g., recall and recognition) when appropriate. 24 (100%)

Freq. – digital contents (>= 12) that do not meet evaluation criteria.

According to the overall results, Croatian publishers for Croatian language learning in primary education did not fulfil all multimedia digital educational resources criteria, and hypothesis H1 is rejected.

DISCUSSION AND CONCLUSION

Regarding the *Usability* criteria, all additional digital contents provide adequate software portability by working on different operating systems (Windows, Mac OS, Unix), with an easy installation process (Al-Alwani, 2014), clear directions for registration (Lee and Owens, 2004) and appropriate accessibility where pupil can view materials and additional digital content on a variety of devices (phone, tablet, laptop, desktop), (Rice and Ortiz, 2021). The software provides pupils with opportunities to access extended feedback from their teachers and peers, or others through e-mail or other Internet communications (Reeves et al., 2002).

Contrary to that, digital contents lack simple identification of the button function, simple identification of the pupil’s current location, quick software response (speed of access, connectivity, and download) (Lee and Owens, 2004); bug-free software; pupil control of the graphic attributes of the interface; adequately ornate screen for the pupil to be able to perceive the important information (Unić et al., 2012); online help provided that is screen and/or context-specific; readable and understandable online help or documentation written clearly and available from any logical part of digital educational content; time tailored feedback for the content being studied, problem being solved, or task being completed by the pupil (Reeves et al., 2002).

Regarding the *Multimedia Incorporation* criteria, all additional digital contents are attractive, engaging, and motivating in their general appearance. Regarding the content, various forms of media are used for enrichment from a technical aspect. Multimedia design encompasses signalization principle in the forms of overview, review, titles, headings, typographical design elements, and highlighted important parts of the content (different terms and concepts). Digital content has a technically satisfying structure of texts (simplicity and clarity; readability of font; colours compatibility against the background), graphics quality (attractive and diverse illustrations with respect to the content; orientation; colours; lighting; acceptable visibility of objects/figures against the background), and sound quality (authentic and clear voice of the narrator with pleasing intonation; well-recorded learning material that

engages pupil interest) (Unić et al., 2012). Digital content also considers pupils' sensory impairments. Contrary to that, digital contents lack appropriate information presentation guidelines for organization and layout; appropriate learning design to achieve its stated objectives (text, video, animation, music, narration, sound effects, and special visual effects are not effectively and appropriately used); adequate placement of the most important information on the screen in the areas that would attract pupils' attention; appropriate media selected to match message design guidelines or to support instructional design principles; consistency of the font choices, colours, and sizes with appropriate screen design recommendations for e-learning programs (Reeves et al., 2002); clarity of all images and graphics; optimized size for multimedia contents (Al-Alwani, 2014); visual elements on screen grouped in a logical and harmonious way; appropriate application of sound effects (attraction of the pupil attention) (Unić et al., 2012); graphics reinforcement of material (Lee and Owens, 2004); changeability of the displayed text by the pupil; support for vision/hearing challenges (e.g., alternative text for images, captions for video, sign language interpretation, transcripts) (Rice and Ortiz, 2021).

Regarding *Content Management* criteria, all additional digital contents are for the pupil's individual use, and they present a sufficient amount of information directly and consistently. Learning material has an overview that describes the content purpose, outline and learning objectives. Learning activities, questions, quizzes, and tests are easy to understand, and they teach and test in accordance with learning objectives (Unić et al., 2012). They are challenging and accessible but suitable for the developmental age of pupils and support different abilities and learning styles (Croatian Academic and Research Network – CARNET, 2016).

Contrary to that, digital contents lack the possibility of group use; having an overview that describes the purpose of the content, the content outline, and learning objectives presented in a clear and understandable way; program consideration of pupil progression (provision of different activities or perturbations depending on pupil performance) (Unić et al., 2012); methodical presentation of content and learning activities (from closer to further; from simple to complex; from easier to more difficult; from concrete to abstract); learning activities for pupils who want to learn more (Croatian Academic and Research Network – CARNET, 2016); encouragement toward a higher level of learning through learning activities that meet all objectives; promotion of higher level of learning through creatively sequenced learning activities (Quality Assurance of Multimedia Learning Materials, 2010).

Regarding the *Navigation* criteria, all additional digital contents include a table of contents, directions and instructions on the screen, with the possibility of exiting and returning to the same location while taking a learning activity (Al-Alwani, 2014) or the possibility of leaving the program whenever the pupil

desires, with a simple return to the closest logical point in the program (Reeves et al., 2002); consistency in using interactive elements that always fulfil the same function; user control capabilities with reasonable number of clicks for receiving necessary information and ability for the pupil to go "home", "back", "forward" in the program (Unić et al., 2012). The pupil has basic audio and/or video control capabilities (play, stop, pause, forward, backward) (Al-Alwani, 2014) and sufficient space for clicking and typing (Rice and Ortiz, 2021). Learning activities have appropriate titles with respect to their content, logical structure, and clear instructions with explanations on how to perform specific exercises (Croatian Academic and Research Network – CARNET, 2016). Digital content has an appropriate level of consistency in its overall design (Unić et al., 2012).

Contrary to that, digital contents lack an interface that speaks for itself with no interference from an extensive consultation of a manual or other documentation while learning (Reeves et al., 2002), intuitive and innovative navigation (Lee and Owens, 2004; Quality Assurance of Multimedia Learning Materials, 2010); simple use of the home page; simple use of navigation tools (Al-Alwani, 2014); manageable navigation structure with a main menu, different modules and education modules and nodes that need minimal actions (appropriate quantity of menus and submenus) necessary to reach a goal (Unić et al., 2012).

Regarding the *Usefulness* criteria, all digital contents provide a rich learning environment aligned with examples from pupils' everyday lives (Al-Alwani, 2014; Croatian Academic and Research Network – CARNET, 2016), with many forms of interactivity to engage the pupil and enough learning activities for checking pupil retention and transfer performance (Lee and Owens, 2004). Learning activities are closely aligned with learning goals and objectives (Reeves et al., 2002) and have motivational elements to capture interest and engage the pupil (Unić et al., 2012). They offer basic interactions, such as True/False, multiple choice and single/multiple answer(s), target area, matching, sorting, etc. (Lee and Owens, 2004). Digital content includes links to external materials (websites, video files, etc.) (Reeves et al., 2002) and invites behavioural engagement by offering simple feedback (e.g., colours, sounds, images, short phrases or praise) (Rice and Ortiz, 2021).

Contrary to that, digital contents lack the encouragement of question-answer problem solving (Unić et al., 2012); promotion of multiple, complex responses (problem-solving tasks) instead of simple "canned answers"; using games in the material; offering of complex feedback (e.g., performance assessment, item analysis) (Rice and Ortiz, 2021); and the provision of a virtual tutor (Unić et al., 2012).

Regarding the *Learning Management* criteria, all additional digital contents include the possibility to undo the pupil's incorrect answers and/or entries, the of having more than one attempt while using different assessment tools and the appropriate evaluation of

each section (Al-Alwani, 2014).

Contrary to that, digital contents lack the variety of assessment tools; clarity of amendment of incorrect choices when answering; the possibility of requesting to display the correct answer or solution to the problem at hand (Al-Alwani, 2014); the provision of sufficient feedback to the pupil for possible remedial directions (with respect to the content); the provision of opportunities for self-assessments that advance the pupil's achievement (with respect to the content); the provision of higher-order assessments (e.g., analysis, synthesis, and evaluation) rather than lower-order assessments (e.g., recall and recognition) when appropriate (Reeves et al., 2002); the necessity of mastery of each section's content before proceeding to the next section; and the possibility to record the pupil's performance data (Unić et al., 2012).

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