

An Evaluation of Canvas LMS through Universal Design for Learning Principles and IMS Standards

Evrensel Tasarım İlkeleri ve IMS Standartları Kapsamında Canvas LMS'in Değerlendirilmesi

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Abstract: Universal Design for Learning (UDL) is an educational framework that aims to make learning accessible to all individuals, regardless of their abilities or disabilities. This framework is based on the principle that by designing educational materials and environments with a wide range of learners in mind, more inclusive and effective learning experiences could be created. One key aspect of UDL is the use of technology, particularly e-learning, to create flexible and adaptable learning materials and environments. With e-learning, students can access course materials and participate in online activities and discussions at their own pace and in a way that works best for them. This can include using text-to-speech tools, video captions, and other assistive technologies to make course content more accessible to students with disabilities. UDL also emphasizes the importance of providing multiple ways for students to access and engage with course content, including through different media (such as text, images, video, and audio), as well as multiple methods of expression (such as writing, speaking, drawing, or presenting). This allows students to choose the learning approaches that work best for them and helps to ensure that all students have an equal opportunity to learn and succeed. This paper presents an evaluation of Canvas learning management system taking into account the UDL principles, and IMS Global Standards for e-learning tool implementation.

Keywords: Canvas LMS, Universal Design for Learning, IMS Standards, Technology-Enhanced Learning, Digital Teaching

Öz: Öğrenme için Evrensel Tasarım İlkeleri (ETİ, en: UDL), yetenekleri veya engelleri ne olursa olsun öğrenmeyi tüm bireyler için erişilebilir kılmayı amaçlayan bir eğitim çerçevesidir. Bu çerçeve, eğitim materyalleri ve ortamlarının geniş bir öğrenci yelpazesi düşünülerek tasarlanarak daha kapsayıcı ve etkili öğrenme deneyimlerinin yaratılabileceği ilkesine dayanmaktadır. ETİ'nin önemli bir yönü, esnek ve uyarlanabilir öğrenme materyalleri ve ortamları yaratmak için teknolojinin, özellikle e-öğrenmenin kullanılmasıdır. E-öğrenme ile öğrenciler ders materyallerine erişebilir ve

çevrimiçi etkinliklere ve tartışmalara kendi hızlarında ve kendileri için en uygun şekilde katılabilir. Bu, ders içeriğini engelli öğrenciler için daha erişilebilir hale getirmek için metin okuma araçlarının, video altyazılarının ve diğer yardımcı teknolojilerin kullanılmasını içerebilir. ETİ aynı zamanda öğrencilere farklı ortamlar (metin, resim, video ve ses gibi) ve birden çok ifade yöntemi (yazma, konuşma, çizim veya sunum) tasarlanmasında da rehberlik etmektedir. Bu, öğrencilerin kendileri için en uygun öğrenme yaklaşımlarını seçmelerine olanak tanır ve tüm öğrencilerin öğrenmek ve başarılı olmak için eşit fırsatlara sahip olmasını sağlamaya yardımcı olur. Bu makalede, ETİ ilkelerini ve e-öğrenme aracı uygulaması için IMS Küresel Standartlarını dikkate alarak Canvas öğrenme yönetim sisteminin bir değerlendirmesi sunulmaktadır.

Anahtar Kelimeler: *Canvas LMS, Evrensel Tasarım İlkeleri, IMS Standartları, Teknoloji-Destekli Öğretim, Dijital Öğrenme*

1. Introduction

E-learning has gained extensive popularity in recent decades due to its benefits such as low-cost implementation and running, opportunity for higher level of diversity of learners and instructors, asynchronous and synchronous learning modes, independence from place and time (Means et al., 2013). Advances in e-learning led to a variety of models being offered for effective digital learning implementation, one of the most recognized of them as learning management systems. (Sangrà, Vlachopoulos, & Cabrera, 2012). Hence, educational technology integration into the e-learning systems (Robyler, 2006) has paved the way for learning management systems (LMS) to be an actively used tool that brings several components of e-learning in one place. Among countless LMS platforms, a number of them have stood out with their instructional design characteristics and fitness. Canvas, one of the most-preferred LMS platforms at all levels of education all over the world, complies well with the universal design principles for learning that stem from student-, instructor-, material-related and institutional needs (Ahmad et al., 2018). Canvas has been systemized by internationally accredited consortiums and institutions based on scientific and evidence-informed theories. Parallel to the developments in e-learning, universal design principles have become a focal point in order to meet the needs of special learners, disadvantaged groups, changing demographics and diversity in digital learning environments (Pacansky-Brock et al. 2019; Lee, 2016). In this article, relevant characteristics of the Canvas LMS will be discussed and examined within the framework of Universal Design for Learning principles (UDL) (Burgstahler, 2007) and relevant IMS Global Learning Consortium Standards (Sayago et al., 2006; IMS, 2003).

2. Universal Design for Learning and Canvas Learning Management System

An initial step to examine Canvas LMS is safe to start with the introduction of the three categories of the Universal Design for Learning (UDL):

- Multiple representations of content (Recognition)
- Multiple means of action and expression (Strategic)
- Multiple means of engagement (Affective)

Under three categories, seven principles of UDL have been implicitly placed which are *Equitable Use, Flexibility in Use, Simple and Intuitive Use, Perceptible Information, Tolerance for Error, Low Physical Effort, Size and Space for Approach and Use*.

UDL is based on universal design theory that suggests taking into consideration environments, products, services for optimum accessibility of learners and users (Rao et al., 2015). Commencing with the first component of UDL which is *multiple representations of content*, providing options for perception, language, symbols and comprehension stands out. These options enable customization and alternatives for auditory and visual information which is theorized and evidenced in dual-channel theory put forward by Mayer and Moreno (1998). Canvas LMS meets this criterion by the use of external apps that enable the user to integrate font- and size-changers, text-to-speech applications, different media uploads such as text, audio and video. Apart from these add-ons, Google Translate integration aids learners with the target language problems while rich text editors can bring in external and internal pictures, slideshows, audio and video materials. Moreover, multiple media options will equip learners to benefit from games, self-assessments and plain texts. Furthermore, to activate prior knowledge (Rumelhart, 1980), pre-reading surveys, giving background information via web links, opening discussion boards, sharing the goals and objectives of the course or unit, igniting video-, audio-, text-based discussions among students, collaborative student discussions will enhance the quality of learning and instruction (Dickinson & Gronseth, 2020). In brief, Canvas LMS meets all the criteria within the category of *multiple representations of content* with the integration of external applications into the platform and the LMS's built-in features.

Regarding the second component of the UDL, *multiple means of action and expression*, opportunities for physical and emotional action together with communicative and cognitive functions make an LMS an invaluable platform for active learning and peer-learning (Bonwell & Eison, 1991). Accessibility, presence of assistive technologies, abundance of constructivist learning Web 2.0 tools, goal-setting and monitoring one's

own progress would maximize the learning gains (Noyes, 2019). In convenience with these needs, Canvas LMS includes two forms of interaction for discussion boards: student–student and student–instructor. What’s more, the availability of external tool integration to the platform such as advanced versions of Web 2.0 tools including mind–maps, timelines, gamification elements and interactive videos are within the reach of instructors to be used whenever it fits (Reinle, 2020). Besides, communication tools in Canvas platform allow students, instructors, school leaders and parents to easily and effectively communicate with one another. What’s more important, the presence of self–assessment tools and quizzes turns Canvas LMS into a very effective platform for analyzing student needs and the acquisition of self–regulative skills. As is seen, Canvas LMS fits very well to the UDL category of *multiple means of action and expression*.

The third category of the UDL principles, *multiple means of engagement*, enables LMS platforms to support self–paced, individualized, personalized learning (Yarandi, Jahankhani & Tawil, 2013). To exemplify, giving students surveys before the lessons, supporting the relevancy of course content and goals to real life scenarios and enabling students to choose among a pool of projects are available on Canvas LMS (Instructure, 2017). Furthermore, challenging students with tasks and assignments including multiple media and forms such as audio, video, discussion forums, argumentation and podcasts will assist students to accomplish certain completion goals, research activities, peer collaboration, analysis and synthesis of various resources and information. Following one’s progress in such diverse ways will optimize learning via challenges, goal–setting and gaining responsibility. Apart from all, constructive and timely feedback, aligning tasks and assignments with rubrics, facilitating collaboration and coping skills will boost learners’ self–regulative skills (Zimmerman, 1998) which is an indispensable part of e–learning paradigms such as online, hybrid, blended and asynchronous learning. Students in Canvas LMS can also track their progress aligned with course goals and learning objectives. Use of blogs and e–portfolios (Lane, 2007) is another advantage that Canvas LMS offers as an integrated tool. In the e–portfolio section of the platform, students and instructors can follow the progress and collection of the learning materials and projects that are conducted and accomplished by students (Baran & AlZoubi, 2020). These features enable Canvas to comply with the third category of UDL which is *multiple means of engagement*.

3. IMS Global Standards and Canvas Learning Management System

Canvas LMS has been examined within the framework of UD, however, the principles of UD touch upon the pedagogical aspects of an LMS rather than its technical aspects. To

compensate for the technical side of the Canvas LMS, it is presumed to be viable to benefit from the IMS Global Learning Consortium Standards (IMS, 2003b). According to the standards of the IMS, in order for an LMS to be adequate to meet the global standards and requirements, it needs to comply with a list of credentials such as learner records, security, learning tools, digital credentials and badges, e-Assessment, LTI (learning tools interoperability), accessibility, metadata, e-Portfolio, digital repositories and reusable learning materials (McGovern, 2020). Being in compliance with the IMS standards, the Canvas LMS has been accredited as it offers shareable, reusable objects, presence of e-assessment and e-portfolio options, security systems, learner records such as name, surname, birthdate, affiliations, status, title and with other relevant features. Despite the fact that all the standards are crucial, the LTI feature is considered to be a particularly vital point of essence in LMS ecosystems. In the times of content and information transfer, technical collapse and closing, economical and natural catastrophes, there will be a sudden need to transfer all the courses, users, materials, exams and relevant items to a new platform or backup. This is where an LTI is of use. Through the LTI tools, any content could be saved, transferred and setup in another web platform. Otherwise, in the absence of the LTI feature, all collections and compilations bear the risk of getting lost which is the riskiest scenario for an educational institution.

4. Conclusion

Concluding with the examination of the Canvas LMS, the platform has been under scrutiny within two frameworks: UDL principles and IMS Standards. It is safe to propose that Canvas LMS is a feasible learning platform that any institution can prefer in accordance with their needs. Meeting all the criteria of UD principles and IMS standards, Canvas LMS could be preferred by institutions for their educational operations.

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