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Stars, Crests & Medals: Visual Badge Design Framework to Gamify & Certify Online Learning

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Abstract. The World Wide Web have changed learning culture and brought with it, massive open online courses (MOOCs). Open Badges is an open standard which allow MOOCs to create digital course diplomas. Badges gamify education and act as a statement of achievement to reward learners as they reach goals and sub-goals in learning. Existing badge frameworks offer conceptual design guidelines, but does not provide granular support to the visual badge design process. This paper reports on a work-in-progress case study which aim to design badges targeted MOOCs for the creative industry. We report and exemplify the differences between gamification badges used internally in MOOCs and certification badges used by learners as genuine evidence of skill acquisition to employers. Finally, we contribute a visual breakdown of badge characteristics which can be used in conjunction with existing conceptual badge design frameworks.

Keywords: open badges, mooc, visual attributes, e-validation, certification

1 Introduction

The European Union (EU) has identified a lack of digital competencies in people working in the creative sector [9] which hampers productivity, value creation, and competitiveness. Massive open online courses (MOOCs) provide digital access to low- or no cost content and skill acquisition. MOOC learners interested in acquiring skills to advance their job careers face major hurdles. They need to be able to display said skills to potential employers, traditionally done through certificates, degrees, and diplomas and complete courses as self-regulated learners. Contrary to traditional institution-based learning, MOOC learners face low completion rates [17] due to a variety of factors including low motivation. Studying in MOOCs lack the motivational support afforded by social contact, e.g. face-to-face with peers and educators in institutional settings.

Digital badges are images which visually resemble a physical badge and further contain invisible embedded metadata. They provide learners with certification, accessible to potential employers. However, poor adherence suggest that learners need a finer degree of granularity in terms of achieving reward, than what badges of certification can provide on their own. Providing additional gamifying badges as intermediate rewards can keep learners engaged, but what this

conceptual distinction means for their visual design is unclear. Instructional designers of MOOCs who want to leverage badges as a gamifying mechanic, lack terminology and palettes to assist the visual articulation of badges as reward.

This paper contributes work in 1) identifying dimensions in certifying badges and gamifying badges for MOOCs 2) identifying the visual components of badges from best practice and 3) synthesizing a visual importance order for the identified MOOC badge dimensions.

2 Background

While badges only recently have gained traction in the scientific literature due to their prominence in gamification context, they have been around for a long time. They have been in use by the scouts movement since 1910 and share similarities to seals that conveyed authority and authenticity for thousands of years. We refer the reader to Ostashewski et al. [16] and Ellis et. al. [7] as entry points to the historical backdrop of badges. Badges, are considered a fundamental gamification mechanic [11], which is described as "the use of game design elements in non-game contexts" [4]. Badges (also known as micro-credentials) recognize achievement and provide a loop of incentives (prior-behavior) and rewards (post-behavior) [11].

Digital badges have at least partly emerged from needs to gauge skills and reputation in e.g. digital games or electronic commerce as signals of trustworthy business partners. Gibson et al. defined digital badges as *"a representation of an accomplishment, interest or affiliation that is visual, available online, and contains metadata including links that help explain the context, meaning, process and result of an activity."* [10]. The definition assumes implicitly that the owner of the badge as well as others can access the visual representation including the relationship between the bearer and the badge. The badge bearer can thus signal abilities, status, achievements, dispositions, reputation etc. to others.

In the context of learning, a number of similar definitions have emerged [14], but the digital context lower administrative overheads. Digital badges cheaply provide credentials at a finer granularity than grade transcripts, certificates, or diplomas and link to factual evidence that allows others to understand the basis on which a badges was awarded and assess whether this is warranted based on face validity.

In educational contexts such as MOOCs, badges take on a secondary role which is situated and limited in terms of visibility to within the learning environment. The learner, the institution, its educators, and potentially peers can see the badges within an institution, an education, or specific parts of an education e.g. courses or even based on specific activities. In this context, badges serve as incentives to encourage and foster positive learning behaviors for the student to understand their learning progress. Badges can also hint of the possible learning trajectories of the learning content [10], which the MOOC provides. As a gamification technique, badges are usually associated with reaching larger milestones as opposed to points that can be used at higher frequency for short

term feedback [2]. Gamified education systems have been using digital badges in relation to 1) finishing an activity (small badges), 2) finishing a step / making progress (medium badges), 3) recognition (large, recognition of proficiency) and 4) finishing a course and external certification [12]. For learners, badges become sub-goals designed to represent e.g. the level of skill needed to complete or the type of competency gained [20]. However, if obtained too easily they might not be attributed to skill development [12]. Typical explanations for low preferences for badges included perceptions of them being childish or silly. [15].

General criticism of digital badges, is directed at the trust in the credibility of digital badges due to their multi-purpose. To accommodate for the multiple roles which badges may carry, it is possible to visually alter the role badges may carry. For example, Higashi et al. [12] played with the size and shape of badges as an indicator of their role (activity or course) and accumulative badges that visually build on another and whether they were meant to give quick feedback/motivation.

This paper seeks to fill in the current gap, that badge authors do not have a concrete framework to inform the visual design of badges. We contribute this visual design framework with intention to be the visual component to existing conceptual badge frameworks, such as Wills et al.'s theoretical framework for digital badge design [20], which describe how badges can be rewarded as learners progress into new zones of proximal development. Other work have textually described design patterns of patterns [3], but did not break down badges into their visual components.

3 Case study

The EU has identified that in particular, the creative industries suffer from a lack of digital competencies [9]. Our case study, the DigiCulture project[5], aims at educating adults working in the creative industry, so that they gain new digital competencies, as defined by the European Digital Competencies Framework [8]. The main outcome of the DigiCulture project is a MOOC containing courses on topics such as The World Wide Web, Digital Safety, Mobile User Experience and Virtual Reality. To facilitate certification, the DigiCulture MOOC will use badges, which follow the Open Badges standard, maintained by the IMS Global Learning Consortium [13]. Open Badges is an open-source framework, which defines how MOOCs can interoperate with badge platforms. Learners can use these badge platforms to share their acquired badges with potential employers who can verify their validity.

In order to design badges with respect to both gamification and verification, we distinguished badges into 1) *gamification badges* and 2) *certification badges*. Figure 1 depicts how gamification badges serve as internal reward to maintain user engagement (also referred to as lightweight badges [19]), whereas certification badges are given through assessment and serve as certificates.
Badge Design Canvas [6] is recognized as a practical badge design tool for educational contexts, which helps designing the process of awarding badges. Using

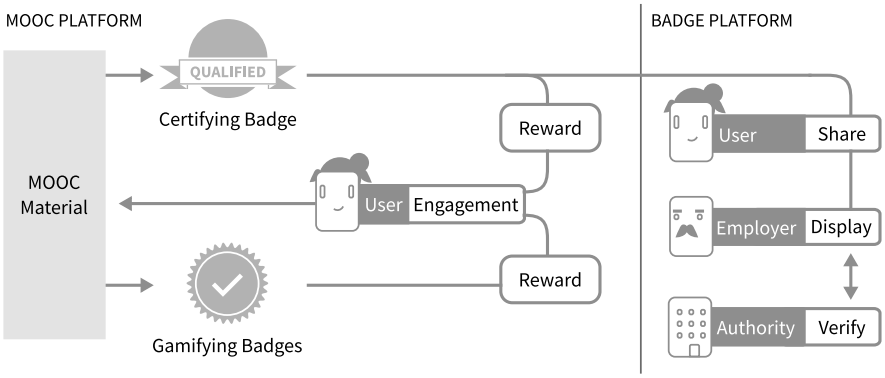


Fig. 1. Flow chart of badges from MOOC to Badge Platform. Gamifying badges only serve as internal reward, whereas certifying badges provide skill verification.

it can give clarification to define, for example, badges' value proposition, the desired user behaviors and the acquired skills each badge represent. We intend to contribute to this design space with more granular tools, which 1) distinguish *certification badges* from *gamification badges*, 2) extend the identification of visual properties in these badge types and 3) provide guidelines for what is visually important.

4 Visual Design Framework

We define certification badges as *badges which are achieved to reflect a certification of skill* and gamification badges as *badges which are achieved as a reward of completing an activity*. Certification and gamification badges serve different audiences. Gamification badges, principally never leave the MOOC ecosphere, which means that there is more freedom for badge designers to use wording or imagery which contextualizes directly to the individual activity. Contrarily, certification badges will be seen by agencies and employers and could be shown in e.g. portfolios or CVs and symbolically act as a certificate, further constraining the visual design process.

The visual design framework is based on critical and creative investigations using *Arts Practice as Research* [18], a method which describes the process undertaken in the creation of visual arts. This included surveying a large number of badge visuals from the internet and related publications and culminated into a digital collage. Figure 2 displays a breakdown of common badge characteristics as observed in educational contexts, useful for informing a design process.

Visual Component	**Example**		
Badge Shape	Geometric Shape	Crest	Other
Supplementary Shape	Sticker	Attachment	
Badge Ribbon	Overlay	Medal	Foliage
Badge Rim	Decorative	Plated	Sticker
Main Icon	Centered Content	Clipped Within	
Supplementary Icon	Centered With Main Icon	Placed on a Rim	Placed Outside
Main Text	On Ribbon	Centered with Main Icon	On Rim
Supplementary Text	Behind Ribbon	On Smaller Ribbon	On Rim

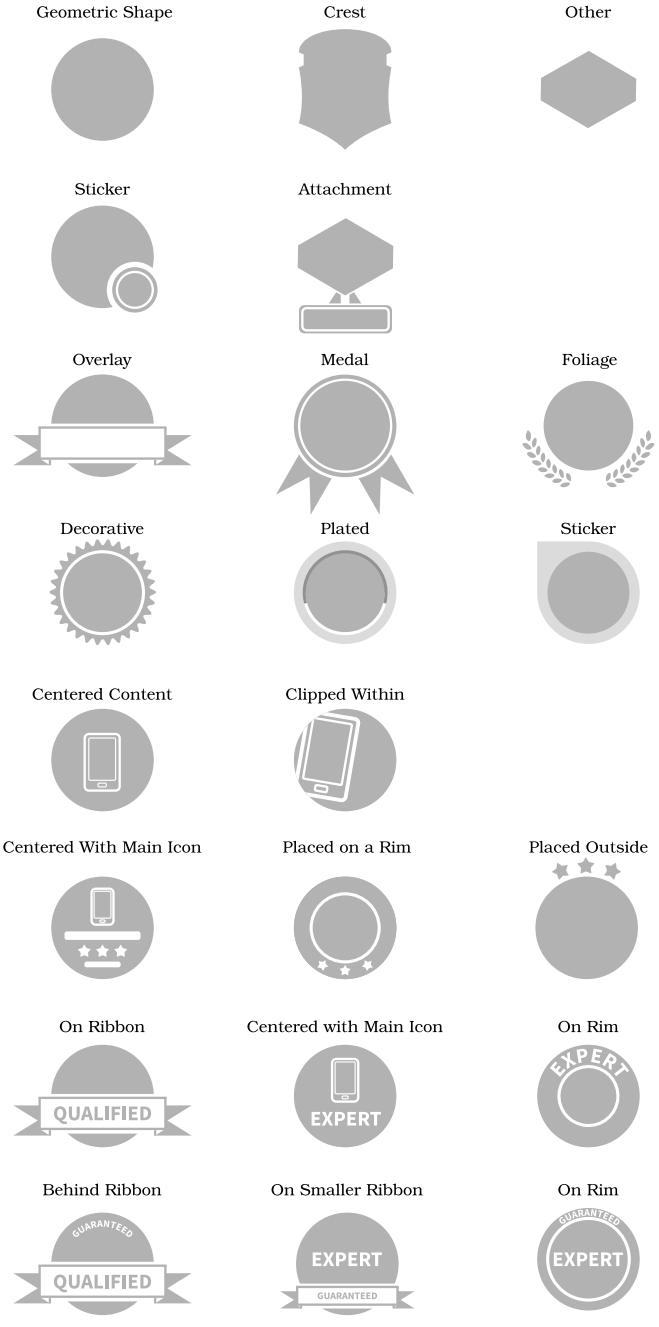


Fig. 2. Landscape of badge visual components and examples of use.

4.1 Mapping Badge Dimensions to Visual Components

Table 1 lists the dimensions in MOOC badges and exemplifies how the dimensions could be used on certifying badges and gamifying badges respectively. The most notable difference between gamifying badges and certifying badges, lies in how the dimensions they share are prioritized in practice through the visual hierarchy, which is described in Table 2. For example, for an certifying badge, having no expiration date means that employers would have no way to establish whether the badge is still a valid representation of the owners skills. Having issuing organization in an certifying badge, would likewise mean that employers would know whether the badge is issued by a trusted source. Due to the certification badge's extended responsibility as a verifiable certification tool, priority is given to explain its purpose and establish its trustworthiness to any audience who is unfamiliar with the MOOC. Gamification badges, on the other hand, can rely on a singular audience and a singular context which creates less constraint. This allows gamification badges to be more expressive than certification badges and therefore can draw more on viscerally response upon receival.

	Certification badge	**Gamification badge**
Name Reflecting student achievement.	Qualified UX Designer	Prototyping Patriarch
Purpose What role does the badge play.	Certifies competencies	Rewards progress.
Audiences Who will view the badge.	Student, Employers	Only the student.
Criterias Badge issuing requirements.	Complete the course.	e.g. Complete a quiz.
Competencies The student's aquired skills.	Content Creation	Content creation.
Course Name What course is the badge from.	Mobile UX Course	Mobile UX Course
Issuer Responsible for badge validity.	MOOC	MOOC
Competency Level Skill level required to achieve badge.	Proficient	Beginner
Issue Date How old the certification is.	02/07/2019	02/07/2019
Expiration Date For how long the badge is valid	02/07/2020	None
Evidence Evidence of the student's skill	e.g.. URLs to a Portfolio	Not Necessary

Table 1. Identified dimensions, exemplified through two MOOC badge types.

Priority	Certifying badge	Gamifying badge
1.	Badge Name The badge's identity.	Badge Name The badge's identity.
2.	Badge Purpose Establishes certification.	Competency Level Gamifying badges reward progress.
3.	Issuing Organization Establishing trust to badge.	Course Name Provides extra context to students.
4.	Expiration Date Establishes badge validity.	-

Table 2. Badge dimensions, prioritized for communication based on badge type.

5 Next Steps

In relation to the DigiCulture project, 13 certifying badges will be designed through consistent mapping between badge dimensions to visual components. In addition, each course will feature any number of gamifying badges, as decided by each partner. To this extend, we have considered to design a badge generator system. Existing systems for designing badges exist, for example *BadgeBuilder* seen in figure 3. A badge generator system could help constrain the design process for partners to maintain visual consistency, while allowing each course to contain its own unique designs.

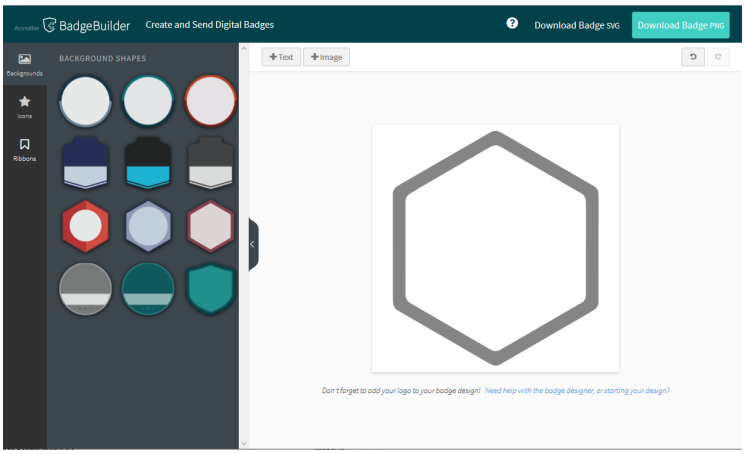


Fig. 3. BadgeBuilder by Accredible [1].

6 Conclusion

Adding multiple purposes to badges create tensions in terms of what information should be given visual priority. We proposed a divide between certification badges and gamification badges, which allow MOOCs to keep badges for internal reward, where higher freedom of expression is allowed from badges given which represent skill acquisition. We presented tools to aid the open badge design process and we intend to design and implement badges of both types for the DigiCulture project.

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