# Digital Badge Credentialing Learning Services in U.S. Libraries and Their Implications (Postprint)

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## Abstract

[Purpose/Significance] This study investigates the service status of digital badge certification learning in US university libraries, aiming to provide inspiration, reference, and lessons for related services in domestic university libraries. [Method/Process] Through search engines, we surveyed digital badge sections on official websites of US university libraries, while simultaneously retrieving and investigating relevant foreign literature through professional foreign language databases to examine the fundamental status of digital badge certification learning services and analyze the methods and content of such services in US libraries. [Results/Conclusion] US university libraries emphasize the design of "game-like" hierarchical digital badge mechanisms to motivate student learning, select and refine platforms compatible with digital badges, seek collaborating institutions to add greater value to digital badges, and utilize digital badges for librarian professional training to enhance librarians' vocational competence and service standards. Digital badges can facilitate the improvement of information literacy education effectiveness in university libraries, and their application and promotion constitute an opportunity for university libraries to elevate their institutional status.

## Full Text

## Digital Badge Certification Learning Services in American Libraries and Their Implications

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**Abstract:** *[Purpose/Significance]* This study examines the status of digital badge certification learning services in American university libraries to provide insights, references, and models for similar services in Chinese university libraries. *[Method/Process]* Through search engines, we investigated digital badge

sections on official websites of American university libraries, while also conducting literature searches in professional foreign language databases to examine the basic status of digital badge certification learning services and analyze their implementation methods and content. *[Result/Conclusion]* American university libraries emphasize designing "game-style" hierarchical digital badge mechanisms to motivate student learning, selecting and improving platforms compatible with digital badges, seeking cooperative institutions to add value to digital badges, and applying digital badges to librarian training to improve professional quality and service levels. Digital badges can promote the effectiveness of information literacy education in university libraries, and their application and promotion represent an opportunity for university libraries to enhance their status.

**Keywords:** digital badges; American university libraries; certification learning; information literacy education

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## 1 Overview of Digital Badge Certification Learning Development

### 1.1 Reasons for the Rise of Digital Badges

In recent years, the MOOC (Massive Open Online Course) trend has swept the globe. MOOCs' online teaching methods, relaxed learning environments, and ability to independently select teaching content have been welcomed by students, representing one of the most significant achievements of educational technology in teaching over recent years [1]. However, evaluating MOOC learning outcomes has become a focus of concern for experts and scholars. Reports indicate that MOOC completion rates are not ideal, with a global average of only 4% [2].

### 1.2 Characteristics and Functions of Digital Badges

Digital badges, also known as "open badges," are a type of micro-credential awarded for formal or informal learning [4]. They serve as visual symbols that visualize and transparently display and evaluate learning processes and achievements [5]. Unlike traditional learning assessments, digital badges are considered "part of American educational reform" [6]. The *Horizon Report* (2015 K-12 Edition) first identified "digital badges" as an emerging technology in the education field [7]. According to reports, after Colorado State University implemented digital badges in its MOOCs, completion rates increased from 9% to 36.1% [8].

### 1.3 Current Research Status

How to stimulate student interest? How to evaluate student performance? These issues that plague traditional classrooms persist in MOOC environments, as online teaching methods cannot resolve them. The New Media Consortium's *Horizon Report* (Higher Education Edition) is a specialized report forecasting technology application and development trends in higher education. For six

consecutive years, key trends in higher education technology applications have focused on learning assessment. A recent study found that 94% of American universities choose to provide students with new forms of learning ability certification [3]. Digital badges are considered an alternative solution for evaluating formal or informal learning [4].

Our search of CNKI revealed that current domestic research on digital badges is limited, with few studies focusing on libraries. In China, digital badge certification is primarily applied in primary education. Yang Zhiya studied the use of digital badges in junior high school informatics Olympiad training, establishing a Moodle course platform and creating six types of badges [9]. Li Guoyun reported on Beijing Middle School's IoT course offerings starting in 2015 and attempts to adopt digital badges as a course evaluation mechanism [10]. These cases integrated digital badges into online learning courses or IoT maker projects for process-based evaluation, stimulating student motivation and improving teacher satisfaction and student achievement, providing new pathways and impetus for IT-driven educational transformation.

### 1.4 Research Methods

During the first author's academic exchange in the United States in November 2018, we used the search query "badges and library" on Google. After screening results, we found that eight American university libraries had established digital badge service sections on their websites providing detailed information. These libraries were: University of Pennsylvania Library [11], SUNY Albany Library [12], University of Notre Dame Library [13], University of Maine Library [14], University of Florida Library [15], College of Western Idaho Library [16], University of Michigan Library [17], and Purdue University Library [18].

In the EBSCO database, using the search query "SU=('digital badges' OR 'open badges' OR 'micro-credentials') AND library," we retrieved 45 relevant English articles. Based on these combined research methods, we systematically analyzed the adoption of digital badge certification learning services in American university libraries.

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## 2 Implementation Methods and Content of Digital Badge Services in American University Libraries

Digital badges break existing university degree and diploma certification models while also transforming library service models, particularly in university libraries. MOOC-registered users can use libraries to complete informal learning, thereby increasing course completion rates and earning digital badges. Libraries provide ideal spaces for these users. Initiatives like Pittsburgh and Chicago's "City of Learning" program [19] position libraries as important partners supporting internet learning and providing digital badges. The University of California,

Davis designed its badge system based on input from experts, employers, professors, and students, with extracurricular learning badges developed by the library for students [20], making the library the most important partner for users to obtain digital badges.

### 2.1 Library Online Information Literacy Education

Information literacy education led by libraries is very common both domestically and internationally. Current formats are divided into online and offline courses based on whether teachers and students meet directly. Online information literacy education is currently very popular in American university libraries, with digital badges forming an important component. For example, the University of Pennsylvania Library and SUNY Albany Library have digital badge sections under their information literacy columns, while the College of Western Idaho Library places its digital badge introduction in the library FAQ section.

The University of Pennsylvania Library designed a set of digital badges suitable for online information literacy education, addressing graduates' need for information literacy skills in the workplace. The badge design concept draws from the American Library Association (ALA) Information Literacy Competency Standards for Higher Education [21], the Framework for Information Literacy for Higher Education [22], and a national survey of employers conducted by the library [23]. The library's digital badges are applied to online information literacy education courses, with videos on the library website explaining how to use them. Students can register to access the information literacy education program. The digital badges are personalized and flexible, comprising 10 basic badges, 3 meta-badges, and 1 master badge. Students must complete all meta-badges to obtain the master badge. Students can access the information literacy education badges through the University of Pennsylvania badge website, submit badge claims according to their learning progress, and the responsible librarian reviews whether the student qualifies for the corresponding badge.

### 2.2 Joint Offline Courses with Other Campus Institutions

In American universities, libraries often collaborate with other campus institutions to offer offline workshops to enhance student capabilities, providing either venues or course platform management and maintenance services.

The University of Maryland Library's Joint Learning Center was established by the library's IT department and the Writing Center. This center uses digital badges in offline information literacy workshops, utilizing the library's computer areas, individual study spaces, learning rooms, maker spaces, and service desks. The workshops are particularly popular with students because no other campus institution provides similar learning conditions. Workshop topics include visual literacy, multimedia production, citation management, poster design, and 3D printing [24]. Oregon State University Library collaborates with the campus Career Services Center and Graduate School to offer extracurricular learning

workshops certified by digital badges. The Graduate School hopes students will master more out-of-classroom skills, while Career Services wants these skills to be recognized by employers. Graduate students can choose different badges based on their interests, with librarians responsible for reviewing and supervising the badge acquisition process [24].

### 2.3 Services Related to Campus-Wide Digital Badge Programs

Digital badges have developed considerably in American universities. As the most important department supporting campus teaching informatization, libraries comprehensively provide various services related to digital badges.

SUNY Albany Library features a digital badge section on its information literacy education homepage, introducing basic knowledge about digital badges to students and faculty, and providing instructors with guidelines for using digital badges. Mastering this content enables achievement of the university's general education information literacy goals [25]. The University of Notre Dame Library developed digital badges for information retrieval literacy. Students who earn badges can demonstrate their ability to access and evaluate information from non-academic and academic sources. Badge earners can also collaborate with subject librarians to discuss research questions and generate a badge portfolio [26]. The College of Western Idaho Library places its information literacy education courses on the Blackboard platform, embedding digital badges within it, and provides detailed instructions in the library FAQ section on how to use digital badges on this platform [27]. Eastern University Library embeds information literacy education in first-year writing courses, introducing digital badges in 2013 and using low-cost course management systems (such as Credly, WordPress, and LearnDash) as platforms, gradually integrating these badges into the university's learning management system [28].

### 2.4 Librarian Training

American university libraries not only emphasize improving user information literacy but also focus on enhancing staff information literacy, with digital badges promoting librarians' professional skills.

Washington University in St. Louis Library applies digital badges to subject librarian training in data information management and geographic information systems [29]. Training is conducted through workshops to help subject librarians better master data management technology and better serve faculty and students. After completing workshops, subject librarians can earn digital badges and receive course feedback evaluations from instructors. Eckerd College Library applies digital badges to student assistant training [30], integrating badges into every stage of the training process to encourage participation. Digital badge certification significantly helps student assistants improve their vocational skills.

## 3 Characteristics of Digital Badge Certification Services in American University Libraries

### 3.1 Designing "Game-Style" Hierarchical Digital Badge Mechanisms to Motivate Students

In American university libraries, faculty use digital badges to track, monitor, capture, and record student learning processes, clearly understanding what students have learned and their learning status, and verifying mastery at any time [31]. Using a badge hierarchy similar to game leveling, badge systems are designed based on course interest points, allowing students to choose their own learning paths. Students use digital badges to record learning trajectories, earning corresponding badge rewards for each knowledge point acquired, higher badges for each completed chapter, and the highest badge reward upon course completion. Students can track their own learning progress and receive corresponding evaluations. They can also share their badge records on social media anytime, showcasing their learning achievements to the outside world, which stimulates learning motivation and provides satisfaction and achievement [32-33]. Students taking the same course need not have identical badge trajectories. This "game-style" hierarchical digital badge mechanism enables self-directed learning, self-improvement, and self-motivation.

The University of Pennsylvania Library integrated its badge program into a 150-hour online information literacy course with good results. Digital badges are considered "a tool for integrating information literacy without university requirements" [34]. Student feedback shows that beyond earning badges, students benefit greatly from personalized feedback. After completing courses and earning badges, instructors provide further personalized evaluation of learning outcomes, successfully building a communication bridge between students and teachers and facilitating beneficial interactions.

### 3.2 Selecting and Improving Platforms Compatible with Digital Badges

Since digital badges require network platforms for implementation, libraries must select appropriate platforms when introducing them. The Mozilla Foundation [35] and MacArthur Foundation-supported Open Badges provide a more standardized platform to unify badge recipients and issuers according to shared standards and credentials [36]. For online courses, full consideration is given to platform integration with digital badge platforms. For offline courses, guidance is provided on how students can obtain badges on network platforms after completing face-to-face learning.

### 3.3 Seeking Cooperative Institutions to Add Value to Digital Badges

Digital badge applications require supervision and guidance from industry authorities. ALA lists digital badges as one of 35 future trends for libraries in its

"Center for the Future of Libraries" website section [37]. This center not only forecasts library trends but also actively promotes digital badge applications in American libraries. It currently collaborates with three associations (Association for Library Collections and Technical Services, Library and Information Technology Association, Public Library Association) and two ALA offices and renowned development programs (Emerging Leaders Program and Spectrum Scholarship Program) to conduct digital badge learning promotion activities. The website details badge operation lists, standards, registration procedures, encourages users to display and share badges, and provides suggestions for improving badge systems. The center also regularly tracks badge users, surveys their usage, and publishes recommendations for advancing or improving digital badge programs.

Libraries can collaborate with other campus institutions to motivate students to earn badges. Oregon State University Library [24] jointly offers courses with the Career Services Center and Graduate School to enhance student learning abilities and digital literacy, using digital badges as learning incentives. Course tasks balance knowledge management skills needed for employment and research. Badges earned by students are recognized by partner institutions, enhancing badge value and stimulating student enthusiasm.

### 3.4 Applying Digital Badges to Librarian Training to Improve Professional Quality and Service Levels

In American university libraries, digital badges can be applied not only to student learning but also to librarian training. Previously, such training lacked unified evaluation standards and failed to attract librarians' attention. However, introducing digital badges provides clear training goals and increases participation enthusiasm. Eckerd College Library [30] trains student assistants according to their employment needs, covering not only library knowledge but also job-related information literacy skills. Students can include digital badges in electronic resumes and portfolios as certification of their information literacy skills for job applications. A 2014 survey of student assistants at the library showed overwhelming satisfaction with the training effectiveness.

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## 4 Implications for Introducing Digital Badge Certification Learning Services in Chinese University Libraries

### 4.1 Digital Badges Can Promote the Effectiveness of Information Literacy Education in University Libraries

Digital badges provide students with effective learning credentials, record learning trajectories, verify learning outcomes, and can be included in resumes. When job hunting, students can visually display earned digital badges, making it easier to gain employer recognition. Applying digital badge certification mechanisms

in information literacy education adds a communication component between teachers and students, enabling instructors to better understand student learning processes and outcomes and develop scientifically sound teaching plans. Digital badges can also be applied to training university library staff, strengthening interaction between trainers and trainees, helping staff adapt to electronic incentive methods, and stimulating enthusiasm for professional development.

### 4.2 Application Effects of Digital Badges Can Be Verified in Real Time

Digital badge certification learning comes in both offline and online formats with rich variety. Offline courses require diverse physical spaces and equipment—such as seminar rooms, multimedia classrooms, computers, projectors, podiums, whiteboards, and round tables—that university libraries can provide. Online courses require personnel familiar with information systems, particularly digital badge management. Both formats require librarians to design, monitor, and guide badge usage. Information literacy education is an important library service, and libraries should emphasize digital badge applications and provide corresponding support services.

The effectiveness of digital badges is verified through three course stages: preliminary design, mid-term testing, and post-feedback. In the design phase, badge design must be reasonable. Poor designs—those inconsistent with course style, unable to attract student interest, or mismatched with course content—can be counterproductive. During testing, designers must continuously revise badge designs according to faculty and student needs. Even well-designed badges that don't meet actual needs can create negative impressions. In the feedback phase, collecting student experiences and feedback is crucial, as stimulating learning interest is the most important goal. Digital badges represent a continuous service requiring design, testing, and feedback.

### 4.3 Application and Promotion of Digital Badges Is an Opportunity for University Libraries to Enhance Their Status

University library participation in digital badge certification learning means libraries can participate in the entire university teaching system, not just as teaching support departments but as providers of personalized, differentiated educational content. University libraries possess advantages including system maintenance personnel, physical spaces, and training instructors that can be concentrated in digital badge certification learning services, advancing traditional service upgrades toward more efficient knowledge services.

University libraries must collaborate with other campus institutions, either as primary promoters or as supporters helping other units or faculty conduct related work. Only by reaching out, uniting with other institutions, and proactively serving can libraries gain more opportunities. Although digital badges appear to be simply network information technology applications, they actually

require cooperation across multiple library departments. Offline information literacy education requires reader services staff to provide physical spaces, digital badge platforms require network systems staff for maintenance and development, application in campus courses requires subject librarian promotion, and online information literacy education requires reference staff for instruction and guidance. Only through departmental cooperation can digital badge certification learning be accomplished.

Digital badges are an emerging educational technology suitable for library applications that remains in its infancy in China. Policy support, division of labor among collaborative departments, responsibility allocation, badge system design, and technical platform construction all require further development. Lifelong education and quality education have always been library responsibilities in serving learning societies, where digital badges have significant development space and play positive roles in library instructional services.

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## References

[1] Zhao Jianhua, Li Ming, Wang Leiyan. Seizing digital opportunities to achieve the UN's fourth sustainable development goal—2018 UNESCO Asia-Pacific higher education MOOC seminar review[J]. Modern Distance Education Research, 2018(4): 3-14.

[2] Ke Ping. Innovation in information literacy education mechanisms for academic literacy among university students, information literacy curriculum online teaching seminar and 20th annual meeting of national chemical engineering colleges information stations PPT sharing[EB/OL]. [2019-06-17]. http://ilos2018.cau.edu.cn/conference/page/9.

[3] SAMANTHA A, MALCOLM B, EDEN D, et al. 2018 NMC horizon report[EB/OL]. [2019-06-17]. https://library.educause.edu/resources/2018/8/2018-nmc-horizon-report.

[4] Liu Dongying, Han Xiaohan. Research on online learning evaluation and certification supported by digital badges[J]. Software Guide, 2017, 16(3): 189-192.

[5] Zhang Dongjian. Review of digital badge applications in online learning[J]. Software Guide (Educational Technology), 2017, 16(8): 74-76.

[6] Hu Xiaoyong, Li Xin, Song Lingqing, et al. Innovation and future of online learning: digital badges—interview with Professor Kyle Peck from Pennsylvania State University[J]. China Educational Technology, 2014(10): 1-6.

[7] JOHNSON L, ADAMS BECKER S, ESTRADA V, et al. 2015 NMC horizon report[EB/OL]. [2019-09-04]. https://www.nmc.org/publication/nmc-horizon-report-2015-k-12-edition/.

[8] Huang Yu. Educational digital badges: new learning certification in the digital age[J]. e-Education Research, 2018, 39(11): 52-60.

[9] Yang Zhiya, Fang Haiguang. Research on online learning process evaluation design based on digital badges[J]. Primary and Secondary School Information Technology Education, 2016(6): 32-36.

[10] Li Guoyun, Zhang Chunhua. Practice and exploration of learning evaluation based on "digital badges"[J]. China Modern Educational Equipment, 2018(10): 77-80.

[11] Online student use of the library[EB/OL]. [2019-06-17]. https://guides.libraries.psu.edu/c.php?g=516093&

[12] Badges[EB/OL]. [2019-06-17]. https://library.albany.edu/infolit/badges.

[13] Library research and information literacy[EB/OL]. [2019-06-17]. https://eportfolio.nd.edu/directory/badge-directory/library-research-and-information-literacy-badge/.

[14] Earn new information literacy badge[EB/OL]. [2019-06-17]. https://library.umaine.edu/2017/10/04/earn-new-information-literacy-badge/.

[15] Badges[EB/OL]. [2019-06-17]. https://infolit.ucf.edu/faculty/badges/.

[16] What are library badges?[EB/OL]. [2019-06-17]. http://cwidaho.libanswers.com/faq/172404.

[17] LTIG-developed badging app pilot completed[EB/OL]. [2019-06-17]. https://www.lib.umich.edu/blogs/library-tech-talk/ltig-developed-badging-app-pilot-completed.

[18] ME490 senior design in biomedical engineering: standards[EB/OL]. [2019-06-17]. http://guides.lib.purdue.edu/c.php?g=865031&p=6204151.

[19] NATALIE O, REMAKEL. This summer, Pittsburgh becomes a citywide campus for learning[EB/OL]. [2019-06-17]. https://remakelearning.org/blog/2015/06/15/in-summer-pittsburgh-becomes-a-citywide-campus-for-learning/.

[20] KEVIN C. A future full of badges[EB/OL]. [2019-06-17]. http://chronicle.com/article/A-Future-Full-of-Badges/131455/.

[21] Information literacy competency standards for higher education[EB/OL]. [2019-06-17]. https://alair.ala.org/handle/11213/7668.

[22] Framework for information literacy for higher education[EB/OL]. [2019-06-17]. http://www.ala.org/acrl/standards/ilframework.

[23] RIMLAND E, RAISH V. Design principles for digital badges used in libraries[J]. Journal of Electronic Resources Librarianship, 2017, 29(4): 211-220.

[24] CINTHYA I, VICTOR D. Using digital badges to organize student learning opportunities[J]. Journal of Electronic Resources Librarianship, 2017, 29(4): 221-235.

[25] Badges[EB/OL]. [2019-06-17]. https://library.albany.edu/infolit/badges.

[26] Library research and information literacy[EB/OL]. [2019-06-17]. https://eportfolio.nd.edu/directory/badge-directory/library-research-and-information-literacy-badge/.

[27] What are library badges?[EB/OL]. [2019-06-17]. http://cwidaho.libanswers.com/faq/172404.

[28] RODGER S, ANDREA R, PUTERBAUGH. Digital badges and library instructional programs: academic library case study[J]. Journal of Electronic Resources Librarianship, 2017, 29(4): 236-244.

[29] CYNTHIA H, JENNIFER M. Digital badges: preparing subject librarians for an evolving research environment[J]. College & Research Libraries News, 2016, 77(2): 70-73.

[30] KIMBERLY C, LIZ P. Digital badges for staff training: motivate employees to learn with micro-credentials[J]. Journal of Electronic Resources Librarianship, 2017, 29(4): 245-254.

[31] 7 things you should know about badges[EB/OL]. [2019-06-17]. https://library.educause.edu/resources/2012/6/7-things-you-should-know-about-badges.

[32] KYLE P. Digital badges: catalyst in the evolution of higher education or "killer app" for alternatives?[EB/OL]. [2019-06-17]. https://evolllution.com/opinions/digital-badges-catalyst-in-the-evolution-of-higher-education-or-killer-app-for-alternatives/.

[33] MICHELLE H. Digital badges gain traction in higher education[EB/OL]. [2019-06-17]. https://edtechtimes.com/2014/03/28/digital-badges-gain-traction-higher-education/.

[34] Integrating information literacy without a university requirement: digital badges as the tool[EB/OL]. [2019-06-17]. https://www.alaoweb.org/conferences/2018/program/.

[35] Mozilla open badges[EB/OL]. [2019-06-17]. https://en.wikipedia.org/wiki/Mozilla_{{{Open}}_{{Badges

[36] DAVID R. How badges really work in higher education?[EB/OL]. [2019-06-17]. https://campustechnology.com/Articles/2013/06/20/How-Badges-Really-Work-in-Higher-Education.aspx.

[37] Trends[EB/OL]. [2019-06-17]. http://www.ala.org/tools/future/trends.

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*Note: Figure translations are in progress. See original paper for figures.*