Development of an educational program to improve the competency of librarians for designing and implementing a library maker space

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Abstract: The purpose of this study is to develop an educational program that improves the competency of librarians to effectively design and implement a library maker space. The importance of effective design and implementation of a library maker space has been raised in the context of The Fourth Industrial Revolution. However, thus far, studies regarding the design and implementation of a library maker space have been insufficient. According to the analysis of answers given by librarians from an online questionnaire and students' interview, the demand for implementing a library maker space was high, but librarians' actual ability to design and implement a library maker space was severely lacking. Therefore, this study aims to develop an educational program for librarians to effectively design and implement a library maker space using RPISD (Rapid Prototype Instructional Systems Development). In a development phase, four usability tests were conducted by SMEs (one University professor, two library directors) and a client. The educational program for a library maker space for librarians consists of 4 modules: 'Concept and necessity of a library maker space', 'Analysis of domestic and foreign cases', 'Practical training of digital tools used by maker space', and 'Writing project documents for a library maker space program'. Based on the results of this study, some conclusions are as follows: First, there is a significant need in offering a new educational course for a library maker space for librarians who are required to change their roles. Second, this educational program includes practical training using on-site practice and discussion method to overcome limitations of traditional instructor-led education. Also, further points of study pertaining to the diversity of education as a graded educational program and consulting for designing and implementing a library maker space were suggested for future research.

Keywords: library maker space, librarian, competency, educational program, RPISD

INTRODUCTION

Maker space is an increasingly popular topic for library settings and library services. As the Fourth Industrial Revolution requires new competencies, such as creativity, collaboration and curiosity, the patron's needs of new competencies in library are arising. For this, in the current generation, the library is no longer a place to solely read and write but has become a place to design, create, share new ideas and make something based on these ideas. According to an interview and online questionnaire analysis of Korean librarians, it showed a high demand for a training program on behalf of the librarians to launch maker spaces in libraries and to manage maker space programs for patrons.

Although the National Library of Korea has many librarian training programs, currently there are no programs for maker spaces in library. Therefore, librarians who are interested in maker space have to conduct research on their own and have struggled to become acquainted with and master this topic. Based on the demand of Korean librarians, this study aims to develop a new librarian educational program, which improves the competency of librarians to effectively design and implement a library maker space in Korea.

RESEARCH QUESTIONS

1) How can we make a new library maker space educational program?
2) What contents are necessary in order to create a new library maker space program?

METHODS

This maker space program was developed using RPISD (Rapid Prototype to Instructional Systems Development). The RPISD model can not only interrelate all the steps like analysis, design and development overcoming the limits of prior linear procedures but also simultaneously gain the information needed from clients, SMEs, and learners throughout the process. At the beginning, the first prototype was made and then with the RPISD model

modifying several prototypes repeatedly, and as a consequence the final product was developed.

RESULTS

This educational program was developed by four instructional designers, a client, and three SMEs via RPISD. The specific development process is as follows

Kickoff meeting

Prior to developing educational program, the scope of task of the education program development project and the role were formulated with the client.

Analysis

The need analysis including performance analysis efforts focused on literature, survey and interviews with a client, SMEs, and learners. Analysis results suggested both training interventions as this educational course and non-training interventions as budget support.

Design

Content for the library maker space was specified, its goal and objectives were defined, hardware (3D printers and Arduino etc.) and software were prepared, and an implementation and evaluation plan was developed. The goal of the program was to help librarians understand the concept and necessity of library maker space and design library maker space and service program. Program objectives derived from these goals were included:

- Learners will describe a concept of a library maker space and recognize its necessity.
- They will analyze domestic and foreign cases of a library maker space and design each maker space program in their own context.
- They will implement digital tools through on-site training.
- They will draw up a plan for a library maker space program.

Based on these objectives, working prototypes were created and were revised three times. The prototypes were reviewed by a client, three SMEs (one University professor, two library directors), and also by learners. The educational program for a library maker space for librarians consists of 4 modules: 'Concept and necessity of a library maker space', 'Analysis of domestic and foreign cases', 'Practical training of digital tools used by maker space', and 'Writing project documents for a library maker space program'. In contrast to traditional instruction which is direct learning, this course provides both theory and practice including an on-site training, discussion method.

- Module 1 - Theory 1
  Orientation for dividing them into teams and improving communication amongst each other ispr given. This module also provides basic conceptual theory and necessity of library maker space.
- Module 2 – Theory 2
  This module features a lecture about domestic and foreign cases of a library maker space, and for each learner to analyze cases.
- Module 3 – Practice 1
  Learners visit a site where maker space has previously been implemented (Gwacheon National Science Museum) and learn how to use digital tools for maker space.
- Module 4 – Practice 2
  Each team draws up a plan for maker space and shares it with each other.

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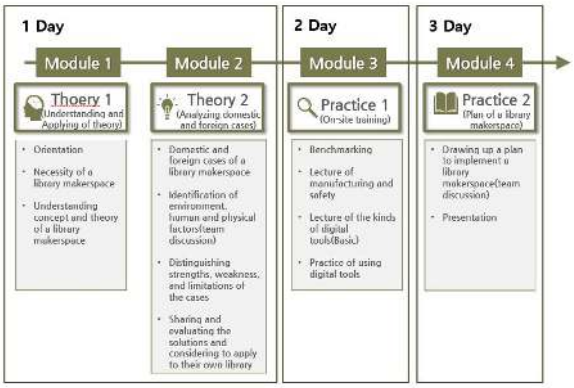

Figure 1. Modules of Prototype

Usability testing

The initial prototype is revised three times through usability testing of interviewing a client, three SMEs, learners and an optimal educational program was designed.

Development

Based on the prototype, materials were developed. At this stage, an instructor's manual, instructor's material (ppt), and learner's material were developed.

Formative Evaluation

This study conducted a One-to one evaluation with a client. The client was largely satisfied with our full package (detailed manual, materials), particularly the portion that suggested diverse cases.

Discussion and Conclusion

Nowadays the world experiences a lot of changes not only in technologies like AI, drones, and self-driving cars, but also in the fields of social culture and education. Those changes lead to setting up maker spaces in libraries in America first and spawning them into the world. In maker spaces people can make something themselves and can be motivated to try to create things that have never existed. If this program

is implemented in libraries, it will prove to be advantageous for those who have the opportunity to participate in these types of programs. Those benefits are following.

First, along with the changing roles of libraries, this program can contribute to establishing a maker space in the libraries around the country, and openning new courses for a maker space in the libraries. Second, the program also can strengthen the capability for librarians to plan and operate a new maker space program based on innovative learning strategies and methods.

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문화체육관광부 (2017). 2017 공공도서관 메이커스페이스 현황 및 인식 조사 분석 보고서. 서울: 문화체육관광부.

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