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Information Practices of Young People at a Public Library Makerspace – A Sense-Making Approach

Abstract: This current study aims to understand how young people interact with information at a public library makerspace, including the opportunities and challenges emerged in their participation. Dervin's Sense-Making theory and methodology were employed in framing the research questions, data collection and analysis. Findings highlighted the informal learning opportunities and challenges during young people's participation at a library makerspace. Further, young people mostly sought information and help from iterative trial and error as well as interpersonal resources. Implications for information professionals at public library makerspaces are discussed.

Résumé:

1. Introduction

With more and more public libraries transforming in their missions from information consumption to information creation (Bagley 2012), makerspaces in public libraries provide physically designed spaces for people to engage in hands-on experiences with technologies and tools. However, little empirical research in the field of Library and Information Science has been conducted to understand young people's information practices in these library makerspaces. With the goal to understand both library makerspaces as designed informal learning environments and information practices of young people participating in playful and creative activities, this current study employs Dervin's Sense-Making (1992; 1999) theory and methodology to develop a holistic understanding of how young people interact with information at a public library makerspace, including the situations and opportunities that bring them to the makerspace, questions they have in their experiences, information and help seeking in bridging gaps, barriers in accessing these informative resources, use and helps with different resources. This paper reports the findings from a set of interviews and surveys collected from a public library makerspace during the first exploratory phase of a larger research project.

2. Background

Young people's everyday life information seeking and need

Unlike the majority of studies on information professionals' active and purposeful information seeking and search for work related information needs, research on young people's everyday-life information practices gives rise to various forms of information needs, seeking and barriers in information activities. Agosto and Hughes-Hassell (2006) identify young people's information needs regarding their intellectual, affective and physical aspects in their everyday life. Yet, the teens rarely report any information needs to engage in creative works and productions.

Previous research shows that young people prefer seeking information through social relationships such as turning to adults, families and peers for information (Agosto & Hughes-Hassell 2006; Shenton & Dixon 2005). Following these are Internet resources, print sources and different forms of mass media (Meyers, Fisher, & Marcoux 2009). Meanwhile, studies show that young people do not always actively seek information even when they have questions (Julien 1999). A number of barriers have been identified as preventing young people from information seeking, such as perceived unhelpful information sources, institution and school scheduling, lack of trusts with adults, and fear of embarrassment (Julien 1999; Meyers, Fisher & Marcoux 2009).

Public library makerspace as informal learning space

Even though located in public libraries - formal institutions that follow professional practices and structures, a library makerspace is a place where informal and collaborative learning may take place (Bowler 2014) and people can set their own learning agenda (Fontichiaro 2014). Makerspaces in libraries providing informal learning spaces are further confirmed among practicing librarians (Farkas 2015; Landgraf 2015). Along with these opportunities, challenges also arise. For example, the CEO of a makerspace in Landgraf's (2015) interviews indicates, "formal buildings can sometimes lead to formal behaviors that can inhibit learning" (34); and the project coordinator of a makerspace points out that school-aged users tend to follow what they are told to do rather than initiating their own tasks.

3. Method

The makerspace reported in this paper is located in an American public library. The makerspace runs mainly two types of programs – one is the weekly theme-based program where people need to register in advance, and the other is the volunteering program where a group of recruited teenage volunteers build their own projects. A total of 37 young people (2^{nd} to 10^{th} graders) who participated in different theme-based makerspace programs and the volunteering program were recruited. Qualitative data were collected through three rounds of data collection, with initial informal semi-structured interviews, follow-up semi-structured interviews and Sense-Making surveys with open-ended questions. All the interviews were transcribed. Interview and survey data were analyzed in Nvivo 10. Overall, Dervin's Sense-Making methodology informs data analysis of this study in both a deductive and inductive way (Cheuk & Dervin 1999). At first, data was coded based on the key elements of Sense-Making theory – situations, gaps, gap bridging and use/helps, to elicit instances for these categories. Following that was the inductive constant comparison technique (Corbin & Strauss 2008) to further generate emerging sub-categories.

4. Findings

The interview and survey data have shown several emerging themes in relation to the situations and opportunities, challenges, questions, informative resources, use and helps as young people participate in makerspace activities, with the volunteering programs presented on the left side of the following tables and the weekly theme-based programs

listed on the right side. For each sub-category, its percentage among all the responses was rounded and presented as a whole number in a descending order.

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“Insert Table 2 here”

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5. Discussion

The findings from this study show that a public library makerspace provides an information-rich informal learning space for young people to engage in building and creating things that are interesting to them. Young people had a wide range of questions and information needs as they were discovering what and how to make things with various materials and tools at makerspace.

Further, the findings show that a makerspace provides collaborative opportunities for young people coming with different levels of expertise and experiences, as they often seek help from the facilitator and their peers. Yet, different from young people’s information seeking in everyday-life settings, this study shows that young people at makerspace sought help from their iterative trial and error. The reason for this preference of trial and error might be due to the nature of makerspace in which people are expected and encouraged to tinker, iterate, and explore through their practices.

The findings also identified some challenges and constrains of a library makerspace. While young people enjoy the free-choice and informal environment of makerspace, it appears that they are also used to being told what to do from adults, which is consistent with the concerns and constrains that several makerspace directors reported in Landgraf’s (2015) interviews.

The findings of this study have several implications for information professionals working with young people at library makerspaces: 1) supports are needed during the initial design and making phases, 2) an informal learning environment at makerspace affords people to question about materials, tools and ideas and engage in information seeking from iterative trial and errors and social resources, and 3) young people still have the tendency of waiting to be told what to do by authorities, thus it is important for makerspace facilitators to provide a balanced guidance and freedom to support their self-driven learning and making experiences.

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Tables

Table 1
Situations and opportunities that drove young people to makerspace

Volunteering programs		*Weekly theme-based programs*	
Situations and opportunities	%	Situations and opportunities	%
"Informal", "hands-on" and "teamwork" learning experiences	29	"A cool place" "to make whatever I want without any instructions from a teacher"	35
Interests in STEM	20	Being asked to do	24
"Convenient" and "easily accessible"	17	"Convenient and free"	18
"Friends being at makerspace"	10	Interests of "making crafts" and "computing"	12
Personal histories with the library	10	Personal fondness of the makerspace facilitator	11
Opportunities of utilizing expertise in technology in helping others	10		
Being asked to do	4		

Table 2
Challenges during makerspace participation

Volunteering programs		*Weekly theme-based programs*	
Challenges	%	Challenges	%
Materials and tools did not work as expected	25	Difficulties in making object details in a 3D modeling tool	50
Lack of experience and skills in using tools	20	Difficulties in making figures in general in a 3D modeling tool	22
Difficulties in finding "right" and "cost-efficient" materials	20	Difficulties in controlling and moving objects in a 3D modeling tool	14
Problematic design of their products	15	Difficulties in visualizing in a 3D modeling tool	14
Difficulties in making a decision when exploring what to make	10		
Physical and temporal constrains	10		

Table 3
Questions that young people came across in participation

Volunteering programs		*Weekly theme-based programs*	
Questions	%	Questions	%
How to build a product	31	How to make certain part of the objects	60

How to improve their product	25	What their final products would be like	20
What to build	25	Questions regarding the materials they use in making	10
Questions about budget	6	Unexpected break-downs with their final products	10
Questions about the tools	6		
Questions about the consequences of break-downs in building process	6		

Table 4

Informative resources that young people consulted

Volunteering programs		*Weekly theme-based programs*	
Informative resources	%	Informative resources	%
Iterative trial and error	30	Makerspace facilitator	59
Makerspace facilitator	23	Iterative trial and error	22
Friends and peers	17	Friends and peers	19
Internet	17		
Books, magazines and manuals	9		
Local stores	4		

Table 5

Use and helps with informative resources

Volunteering programs		*Weekly theme-based programs*	
Use and helps	%	Use and helps	%
To improve their creation	50	To understand	42
To make a better decision	10	To fix their problems	25
To justify what they are doing is right	10	To move forward with their activities	17
To start their building process	10	To finish their creation	8
To understand their troublesome situation	10	To help in their future creations	8
To visualize how to build their project	10		