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RESEARCH ARTICLE

KNOWLEDGE SHARING AND ACQUISITION IN GROUP LEARNING AT LEARNING COMMONS: A NEW CYCLE PHASE IN PROBLEM-BASED LEARNING

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ABSTRACT

Background: Academic libraries of this age have embraced the user-centric approach and introduced learning commons (LC) for interactive learning of its users. They are redesigning their resources and services to meet the diverse learning needs of the Techie Gen LC users. It is an out of class group learning space where users are sharing and acquisitioning knowledge for solving learning problems. Group learning is supported by Problem-Based Learning (PBL) cycle phases where users play a knowledge transformer role. This study checks the relation and the ways that knowledge sharing and acquisition supports PBL phases and thereby confirms a new PBL phase. **Objective(s):** The main aim of the study is to investigate the relation and support of knowledge sharing and acquisition in problem-based learning (PBL) phases and thus determine a new PBL phase for LC. **Methods:** The research used a quantitative approach and included a survey design in its methodology. The online surveys were conducted in three university libraries of Japan and statistical analysis of simple percentage, mean and standard deviation were adopted to analyze the data. **Results:** The Cronbach's alpha score of the construct of knowledge sharing and acquisition was 0.750, skewness -0.531 and kurtosis was 0.651, which reveals it`s strong validity. Moreover, 77.5% of participants perceived that knowledge sharing and acquisition has a positive influence on them in PBL supported group learning at LC. **Conclusion:** The results of the study has revealed that knowledge sharing and acquisition is a new PBL cycle phase for LC group learning. Therefore, LC must combine resources and services in order to foster knowledge sharing and acquisition in PBL supported group learning and thus leverage users' out of class activities.

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INTRODUCTION

The advancement of rapid technological changes and its high acceptance by the information technology efficient 'Techie Generation' (Techie Gen) library users, libraries are now in paradigm shift regarding their spaces, collections and services. Academic libraries have introduced learning commons (LC) for accelerating group learning in it's out of class spaces. Learning needs of library users is ever changing and it is compelling the libraries to redesign their services according to users' wants (Nitecki & Simpson, 2016). Users are expecting interactive and collaborative spaces for their learning in the library (Thomas & McDonald, 2005). Libraries are now in a paradigm shift from information resource-centric view to user-centric approach (Scupola, 2010). Currently they are facing a number of challenges like declining user numbers, decreased circulation, and in-house usage, as well as transitioning to digitization, continuing IT adoption, and financial constraints (Alam, Yoshida & Kohda, 2016).

To face those challenges and to meet the diverse needs of users learning, academic libraries adopt learning commons. LC is the interactive and collaborative space in the library which combines other library services, sources and staff. It has been considered as a platform and a super hub for group and informal learning in academia. LC is a group space where users come by themselves to solve their learning problems in collaboration. It has been a new phenomenon in academia where users engage them in a self-directed manner (Nitecki & Simpson, 2016). Also the LC authority combines their resources so as the users can engage in their problem solving procedures without any hurdle. They integrate physical commons, virtual commons, and cultural commons resources for learning of the users (Beagle, 2006). For creating meaning in learning, LC user students integrate their learning method and solve learning problems in an out of class space. It has been evident that users` group and informal learning at LC are supported by problem-based learning (PBL) methods in an out

of class environment (Alam & Kohda, 2022). PBL of constructivist theory encourages learners to create and share knowledge based on the experience of solving problems (Brown, 2005). Learners are creating knowledge during the group process of learning, and they are sharing and acquisitioning that knowledge among the group mates for generating new ideas and solving problems. Thus, the users play a `knowledge transformer` role in the learning process of PBL. Therefore, the present study adopts knowledge sharing and acquisition (KSA) to check its relation with PBL supported group learning at LC and enable thereby further theorizing of PBL phases in LC learning perspectives.

Objectives: The present study aims to investigate the role of knowledge sharing and acquisition in problem-based learning (PBL) phases and thus determine a new PBL phase for LC. The specific objectives of the study are;

- To study how knowledge sharing and acquisition supports PBL supported group learning.
- To understand the relation of knowledge sharing and acquisition with PBL phases.

LITERATURE REVIEW

Learning Commons (LC): Over the last three decades academic libraries have embraced a new type of service delivery system known as Learning Commons (LC). They are attempting to transform them into social, cultural, and technological hubs by remodeling their physical spaces to accommodate user groups for group learning with digital and print media (Sinclair, 2009). LC is a library service that brings together a variety of additional services, facilities, and learning resources to assist users in their study (Donkai, Toshimori & Mizoue, 2011). It is an inimitable library service in which librarians, commons staff, technical staff, and student tutoring staff collaborate and interact with users for their assignments, research, writing, technical support, information literacy program, faculty development, and curricula development, among other things.

Problem-Based Learning (PBL): Problem-based learning (PBL) is a tutorial technique that began in Canada at the Medical Faculty of McMaster University (Barrows & Tamblyn, 1980). The fundamental approach of PBL is problem solving based learning. It's a learner-centered instructional (and curricular) strategy that encourages students to conduct research, integrate theory and practice, and use knowledge and skills to come up with a viable solution to a problem (Savery, 2006). It helps the learners to create and share knowledge for solving the learning issues. PBL is an instructional approach in which students learn via the use of an assisted complex problem with no one correct answer. (Hmelo-Silver, 2004). The PBL process has four cycle phases of problem identification, formulate inquiry, solution creation and problem conclusion, which the learners use during learning (English & Kitsantas, 2013). Students make use of their knowledge of what they already know about the problems they encounter. In the course of learning they create new knowledge and mix it with the old one by sharing and acquiring between them and it continues till checking their hypothesis.

Group Learning at LC: The LC has inspired librarians and others on campus to consider the role of learning in libraries in a variety of ways (Bennett, 2015). It is a dynamic model that contextualizes information and offers collaborative work spaces where group processes can modify knowledge (Beagle, 1999). Here students across the places were increasingly forming their own collaborative study groups to engage more deeply with their coursework and assignments (Bennett, 2003). LC offers a more comprehensive set of technology resources, more fully integrated services, and a wide selection of collaborative work spaces with varying types, sizes, and adaptability (Bailey & Tierney, 2008, part 1). The purpose of LC resources and services is to foster collaboration and group activity among the learning mates. Students were increasingly forming their own collaborative study groups to engage more deeply and, in some cases, more adventurously with their schoolwork. The main aim of LC is to provide out of class group spaces for learners.

Knowledge Sharing and Acquisition: Identifying knowledge gaps in relation to the problem is an important aspect of the PBL cycle and these gaps are known as the learning problems that students research during their learning (Hmelo-Silver, 2004). The students create questions based on self-identified knowledge gaps, and they use these questions to steer independent study outside of the classroom (Allen, Donham & Bernhardt, 2011). In the first phase of PBL, students try to find the knowledge gap and gradually they collect, share, acquire, create new knowledge, apply and review what they have learnt at the end of the phases. Thus, the knowledge sharing and acquisition process begins in the first phase of the cycle and ends till the last phase before concluding the learning problems. User students of LC are no exception to this knowledge sharing and acquisition practice during their PBL process. LCs` group work opportunity for the learners gives them the chance to identify knowledge gaps and they share and acquire new knowledge for solving the learning problems.

METHODOLOGY

This section discusses the methods and approaches used in this examination of the role of knowledge sharing and acquisition in PBL supported group learning at LC. The methodologies employed for quantitative aspects of the study are covered to address the research objectives driving this study, as well as the main part of data analysis.

Research Approach: The current study is interpretive in nature where literature supports the use of quantitative tools. This quantitative research uses measurable data, as well as statistical analysis to support the objectives of the study.

Research Design: The study adopted the survey research design and conducted an online survey in the learning commons of university libraries of Japan. There were 105 respondents who participated in the survey. As the quantitative approach is a more scientific and reliable one to dig into the problem, a structured questionnaire was developed and emailed to the students of the respective universities. Google Forms was employed as an online survey collecting tool for providing the responses easily by the respondents.

Population and Sample: The population of the study comprises bachelor, certificate course, master, doctoral and special auditor students of Japan Advanced Institute of Science and Technology (JAIST), Kanazawa University and Nagoya

University. Purposive sampling technique was employed and LC users of the respective university libraries were determined as the sample.

Table 1. Respondents of the study

Academic Institution	Respondent
JAIST (Japan Advanced Institute of Science and Technology)	47
Kanazawa University	56
Nagoya University	2
Total	N=105

Data Collection and Analysis: Data were collected through online surveys from JAIST, Kanazawa University and Nagoya University of Japan during the months of June and July 2019. For collecting the responses a 7 point Likert Scale was used. The study adopted statistical analysis of simple percentage, mean and standard deviation of the responses using SPSS 25.0 program.

RESULTS

Knowledge sharing and acquisition has been identified as a mediating construct of the study which proves a positive connection with the respondents in identifying their learning problems, formulate inquiry, solution creation and problem conclusion. Evidence and practice of knowledge sharing of the users during learning are presented here. In seeking the link of knowledge sharing and acquisition with the phases of problem-based learning (PBL) several questions were asked to the respondents.

Based on the literature review it has determined some variables upon which the questions (Table 3) were prepared. Most of the participants (77.5%) perceived that knowledge sharing and acquisition has a positive influence on them in PBL supported group learning at LC. The mean response for knowledge sharing and acquisition was 5.37 with a standard deviation of 0.932. The Cronbach's alpha score of the construct was 0.750, Skewness -0.531 and Kurtosis0.651. Among the respondents, 75% have agreed that (*Q1*) they discuss collected knowledge of the problem topics to understand new findings of the matter (mean score 5.18, standard deviation 1.34). Q2 asked them how discussion and knowledge sharing help in learning. Among them 85% have given the opinion that it helps them to innovate new ideas on the way to problem identification, formulate inquiry, solution creation and problem conclusion (mean score 5.81, standard deviation 1.24). The Q3 has tried to understand their perception of group discussion with knowledge acquisition, 82% of them have given a positive opinion that it helps them to integrate the collected knowledge with their current information and knowledge base (mean score 5.41, standard deviation 1.14).

They have been asked (*Q4*) how writing results (knowledge acquisition) helps them on the way to problem conclusion and 72% of respondents replied that preparation of solution assist them to combine new knowledge with the old one and they can generate new concepts for concluding the problems (mean score 5.10, standard deviation 1.23). The standard deviations for all the items (variables) are near to 1 and they are ranging from 1.14 to 1.34 (Table 3), which indicates the item scores are relatively close to mean scores.

Table 2. User`s responses for knowledge sharing and acquisition in group learning

Question	Strongly disagree	Disagree	Disagree somewhat	Neither disagree nor agree	Agree somewhat	Agree	Strongly agree
Q1. We discuss about collected knowledge to understand new findings (*problem identification*)	0.0	5.7	6.7	12.4	28.6	32.4	14.3
Q2.Discussion and sharing idea and knowledge help me to innovate new ideas (*formulate inquiry*)	0.0	1.9	4.8	7.6	16.2	35.2	34.3
Q3. In group discussion we integrate the collected knowledge (*solution creation*)	0.0	1.9	3.8	12.4	31.4	34.3	16.2
Q4. By writing results we combine knowledge and develop new concepts with old one (*problem conclusion*)	0.0	2.9	7.6	18.1	31.4	28.6	11.4
Valid Percent	0.0	3.1	6.8	12.0	26.9	32.0	19.0
Cumulated Percent		9.9		12.6		77.5	

Note: Cumulated Percent: Disagree = Sum of Strongly disagree + Disagree + Disagree somewhat and Agree = Sum of Agree somewhat + Agree + Strongly agree.

Table 3. Relation of knowledge sharing and acquisition with PBL phases

Item(s) of KSA	PBL Cycle Phases	Cumulated Agree (%)	Cumulated Disagree (%)	Mean	SD
Understand new findings	Problem Identification	75.0	12.4	5.18	1.34
Discussion & knowledge sharing	Formulate Inquiry	85.0	6.7	5.81	1.24
Integrate knowledge	Solution Creation	82.0	5.7	5.41	1.14
Combine knowledge & complete solution	Problem Conclusion	72.0	10.5	5.10	1.23

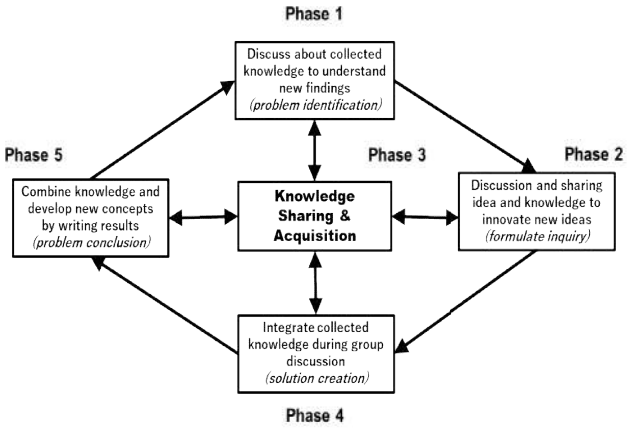

Figure 1. Knowledge sharing and acquisition as a new PBL cycle phase for LC

DISCUSSION AND NEW PBL PHASE

The results of the study reveals that knowledge sharing and acquisition has an inseparable relation with the PBL phases and it supports PBL based group learning at learning commons. It shows that in the knowledge sharing and acquisition process users play a transformer role throughout the PBL phases. LC is an interactive space where users are learning in groups through discussion, reflection, feedback, peer teaching, sharing and acquisition of thoughts and knowledge. During the group learning process of LC, learners create knowledge and share it with their peers in order to generate new ideas and solve issues. Students gather knowledge and share and acquire it among themselves as part of their learning process in order to create new knowledge and address learning problems. In the problem-solving process, students are creating new information and sharing and acquiring knowledge through cooperative learning. As a result, in the out of class space that LC has established, the students themselves are acting as knowledge transformer among the peers in the absence of their teachers. Findings support that PBL cycle phases of Hmelo-Silver (2004) where she identified `knowledge deficiencies` and `apply new knowledge` as the steps of the process. So, the study determines that knowledge sharing and acquisition behavior of users is a confirmed new PBL cycle phase for LC.

CONCLUSION

Knowledge sharing and acquisition is a collaborative process which leads to generating new knowledge and ideas and that helps to solve learning problems. LC is a user-centered approach of the libraries intended to provide a vibrant space for learning. The result of this present research has evidenced that knowledge sharing and acquisition is contributing as a mediating factor of learning at LC. It has explored knowledge sharing and acquisition as a new PBL cycle phase for LC group learning. Therefore, LC needs to integrate resources and services with an aim to create an environment for knowledge sharing and acquisition in PBL supported group learning and to leverage the out of class activities of the students. It needs to concentrate on group learning process of its collaborative spaces. Tutoring staff needs to give emphasis to engage the users in groups so that they can engross in problem solving process based on the knowledge sharing and acquisition. Apart from that the knowledge sharing and acquisition culture of the users are found as an inseparable part of group learning at LC. It shows that knowledge sharing and acquisition helps the learners to generate new ideas and reach a conclusion with a suitable solution. Therefore, LC needs to give more attention in this part and arrange its spaces and services for the proliferation of this behavior of the users.

Conflicts of interest: The author declare no conflict of interest.

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List of abbreviations

JAIST – Japan Advanced Institute of Science and Technology

KSA - Knowledge Sharing and Acquisition

LC – Learning Commons

PBL – Problem-Based Learning

Techie Gen – Techie Generation

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