

THE IMPACT OF LEARNING OBJECT REPOSITORY (LOR) IN THE DEVELOPMENT OF PATTERN MAKING SKILLS OF HOME ECONOMICS STUDENTS

Dr. Abdellah Ibrahim Mohammed Elfeky and Dr. Marwa Yasien Helmy Elbyaly

Faculty of Education, Najran University, KSA
Faculty of Specific Education, Kafrelsheikh University, Egypt

ABSTRACT: *This study aims to examine the impact of e-learning object repository (LOR) in the development of pattern making skills of home economics students at the faculty of education. The sample consists of (50) students from the Fifth level of the home economics program, (25) students represented the first experimental group whereas the other (25) constituted the other experimental group. The first experimental group learnt by using the e-search, while the second one learnt by using LOR. An achievement test and product evaluation card were used to collect data. The Canadian Repository MERLOT II was adapted and used in the experiment. Findings showed that there are significant differences between the two experimental groups in pattern making skills and related achievement in favor of the second experimental group.*

KEYWORDS: Learning object repository, LOR, Learning object, Pattern Making Basics, pattern making skills, Home Economics

INTRODUCTION

Advancement networking and communication technologies have geared the leading educational institutions across all over the world. Teachers and learners have took advantage of these technologies by saving time, effort and cost while communicating via various learning objects (i.e. texts, photos, videos, graphics, and animations). A learning object is a unit of digital resource that can be shared to support teaching and learning (Wiley, 2000; Wiley & Edwards, 2002; Harman & Koohang, 2005; Wang, 2008). The term “learning object” has been widely used to designate individual instances of these resources (Caws & Friesen & Beaudoin, 2006: 111). In the broadest sense, a learning object is anything that has an educational purpose (McGreal, 2004; Nash, 2005). A learning object can have the form of a single image, a definition, a part of text, a listing, a lesson, a whole course, an e-book, and so forth. The resources are written for the use of different technologies: in plain text, in HTML, XML, Flash, and so forth. (Kaczmarek & Landowska, 2006: 2). Learning objects are defined as “discrete chunks of reusable learning materials or activities that can articulate with other learning objects to build a learning environment”. In other words, “if a learning object is heavily encumbered with its context then a user may find it impossible to utilize in a different”, (Koppi & Bogle & Bogle, 2005: 84).

Rapid developments in the use and reuse of digital learning resources, or ‘learning objects’, have led to a marked increase in the number and range of LOR aimed at supporting sharing and reuse of resources for teaching and learning (Margaryan & Littlejohn, 2008: 333). Along with the increasing use of online and blended teaching/ learning systems, such as WebCT as well as e-portfolio systems, learning objects become increasingly valuable and, at the same

time, the management of LOR becomes complicated (Wang, 2008: 1). LOR is the result of the activity of hundreds or thousands of contributing individuals (Ochoa, 2011: 25). It constitutes a comprehensive strategy to support ICT use in educational contexts (Monge & Ovelar & Azpeitia, 2008: 191). It enables teachers and learners to use, share and manage instructional resources (Yalcinalp & Emiroglu, 2012: 476). Furthermore, it enables the storage, discovery and retrieval of metadata and/or electronic objects stored at a local or distributed level (Monge & Ovelar & Azpeitia, 2008: 191). In other words, LOR is an electronic database that accommodates a collection of small units of educational information or activities that can be accessed for retrieval and use. It enables the organization of learning objects, improve efficiencies, enhance learning object reuse and collaboration, and support-learning opportunities. Repositories can consist of one database or several databases tied together by a common search engine. (Lehman, 2007: 57). Margaryan and Littlejohn (2007:334) claim that the repositories are used depends on the key characteristics of community members as well as the dimensions of these repositories. Thus, it is important to integrate them together and try to investigate issues surrounding the use of LORs to support learning within communities. The repository dynamically grows and improves with the student collaboration. It includes these three direct advantages, (Albarrán & Díaz, 2009: 35):

- i. The content and organization of the repository is not limited to the instructor perspective but is complemented with the point of view of the students.
- ii. The development and updating of the repository puts a heavy load on the instructor, which can be reduced with the participation of the students.
- iii. Student motivation could increase because they collaborate in the learning process of their colleagues.

Many studies have discussed the tools of LOR. Nash (2002) for example, evaluates some practices in the use of learning objects in online courses, reviewed best practices, and suggested new approaches that incorporate learning theory. The finding indicated the need to create an alignment between the development of learning objects and their application to teaching and learning. It also showed that the learning object could be paired with specific learning outcomes within a specific learning theory. Cenichel and Alonso (2011) analyzed the existence of associations between the ratings of peer reviewers and users of MERLOT to discover whether they diverge about the quality assessment of the same material. Resources were divided into different categories of disciplines, i.e. quality of content, potential effectiveness as a teaching tool and ease of use. Findings revealed that there were no associations between the ratings of users and peer reviewers regarding the disciplines of arts, business, mathematics and statistics. However, there was an association between the ratings of users and peer reviewers with regard to the disciplines of education, humanities, science and technology and social sciences. Both groups of evaluators have different impressions about the quality of learning object catalogued in MERLOT. Users and peer reviewers had different impressions about quality.

Caws, Friesen and Beaudoin (2006) aimed to evaluate the specific characteristics of integrating learning object repositories into language programs. Findings revealed students' general satisfaction regarding the content and interface of Foreign Language objects Repositories. Quality and diversity of learning items were satisfactory for both teachers and students, too. Users indicated that the metadata used to describe the resources were effective. Nevertheless, they wanted to have more flexibility in their search and more individualization features allowing them to adapt the system to their learning or teaching preferences. Margaryan and

Littlejohn (2007) aimed to illustrate how communities use repositories, what contradictions are among the individual stakeholders' perceptions of repositories, what barriers for the effective use of repositories to support learning within communities arise from these contradictions, and how these diverse perspectives can be aligned to elicit effective use of repositories. Results of the analysis of three repository systems revealed that if repositories were better aligned with the goals of community members, they would be more likely to achieve their goals. Therefore, for better alignment curators should develop a keen awareness of their communities. Curators should be also aware that there could potentially be mismatches in perspectives of different actors operating at different levels.

Wikipedia defines the pattern as the template from which the parts of a garment are traced onto fabric before being cut out and assembled. Patterns are usually made of paper, and are sometimes made of sturdier materials like paperboard or cardboard if they need to be more robust to withstand repeated use, ([https://en.wikipedia.org/wiki/Pattern_\(sewing\)](https://en.wikipedia.org/wiki/Pattern_(sewing)))

Development of clothes is usually accompanied by patterns development. Patterns differ according to their type. For example, the pattern of the blouse, which is the top part of the uniform, differs from the pattern of a skirt, which usually covers the bottom part of the body beginning from the waist. The dress is a joint from a skirt and a blouse. Patterns are often made by one of the following ways:

- i. Flat pattern which is the most used pattern
- ii. Direct modeling over the artificial mannequin or on the human body.
- iii. Commercial pattern.

Thus, the present study focuses on the use of flat pattern. It aims to study the impact of LOR in the development of pattern making skills of home economics students. In particular, it aims to answer these two questions.

- i. What is the impact of LOR in the achievement of students at the department of home economics at the faculty of education at Najran University?
- ii. What is the impact of LOR in the development of pattern making skills of students at the department of home economics at the faculty of education at Najran University?

METHODOLOGY

The present study seeks to find out the impact of the use of LOR in the development of pattern making skills of home economics students. The study sample, in the final experimentation, consisted of (50) home economics students who were enrolled in their 5th level at the faculty of education, Najran University. Participants were divided randomly into two experimental groups. Each group involved (25) students. The first experimental group learnt by using the e-search, whereas the second experimental studied by using LOR.

Two orientation meetings were held with the study sample for key words distribution. One meeting was to help the first group to use various searching engines. The other one was to illustrate the method of LOR for the second experimental group. In addition, WhatsApp and e-mail were used with both groups for guidance and homework reviewing. In the design of LOR

Pattern Making Basics, the Canadian Repository MERLOT II (<http://www.merlot.org>), which is an international initiative that allows users to catalogue educational resources with the aim of facilitating the use and sharing of online learning technologies (Cafolla, 2002; Cechinel & Sánchez, 2011) as shown in figure (1) was used.

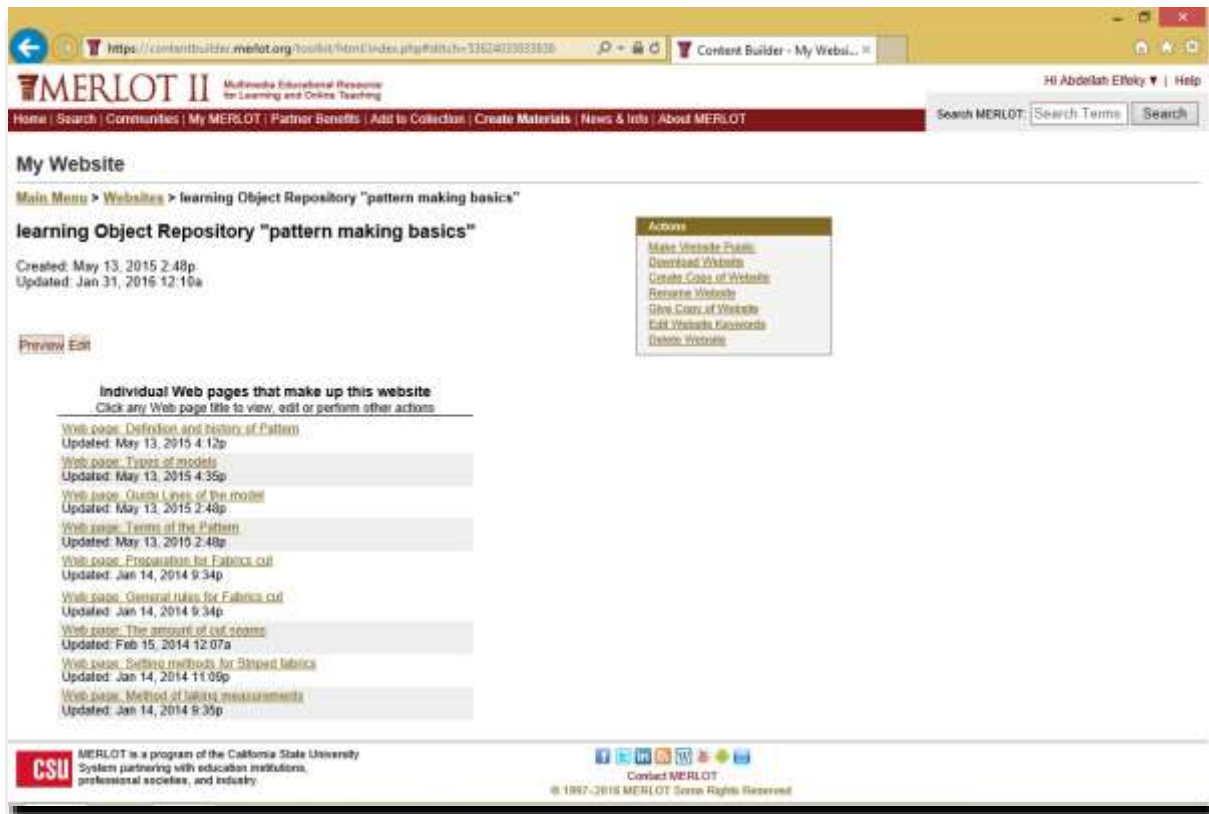


Figure 1. LOR of Pattern Making Basics based on MWRLOT II

Furthermore, the quasi-experimental research approach was used in the present study. Pretest and posttest of equivalent experimental groups were employed for both groups as illustrated in table (1).

Table 1. Research Design

	Pre-test	Treatment	Post-test
Experimental Group1	O ₁	X ₁	O ₂
Experimental Group2	O ₁	X ₂	O ₂

Note. O₁ = achievement/ pattern making skills of pretest

O₂ = achievement/ pattern making skills of posttest

X₁ = E-search Treatment

X₂ = LOR Treatment

An achievement test in Pattern Making Basics and a product- evaluation card were used to check whether there was an impact of the use of LOR in the development of students' pattern making skills. Items of the achievement test were written according to the targeted learning outcomes of the course's content. The academic levels of participants were also accounted for

when writing these items. Thus the final version of the test consisted of (30) items, i.e. (10) items were of the multiple choice type, (10) items were of True/false type, whereas the other (10) items were of the completion type. The test was piloted on (10) students of the department of Home Economics at the college of education at Najran University in order to determine the appropriate time for the test and calculate its validity and reliability coefficients. At the end, (25) minutes were determined as the exact time for the test completion. Using Cronbach Alpha, the reliability coefficient of the test was (0.88), which indicates that the results of the test will be trustful at the end of the application. The product- evaluation card was also prepared for the sake of measuring students' pattern making skills before and after their exposure to the treatment (e-search/ LOR). It consisted of (6) items. Using Cronbach alpha, its reliability coefficient was (0.89) which means that the results will be trustful at the end of the card application on the study sample, too.

Groups' homogeneity regarding achievement and Pattern Making Skills

To check the homogeneity of both groups, the researcher analyzed the results of the pre-applications. ANOVA was used to identify the significance of differences between the means of both groups in the pre- application. Findings are shown in table (2) and table (3).

Table 2. Significance of Differences between the two Experimental Groups in the Achievement Pre- Test

	Sum of Squares	DF	Mean of Square	F. ratio	Sig.
Between Groups	.720	1	.720	.304	.584
Within Groups	113.760	48	2.370		
Total	114.480	49			

Table (2) indicates that there is no statistically significant differences ($\alpha=0.05$) between the two groups in the pre-test. That is, students' achievement levels before the application of the experiment are homogeneous.

Table 3. Significance of Differences between the two Experimental Groups in the Pre-application of Product Evaluation card

	Sum of Squares	DF	Mean of Square	F. ratio	Sig.
Between Groups	1.620	1	1.620	.946	.336
Within Groups	82.160	48	1.712		
Total	83.780	49			

Table (3) indicates also that there is no statistically significant differences ($\alpha=0.05$) between the two groups' pattern making skills in the pre-application of the Product Evaluation card, which means that students' pattern making skills before the application of the experiment are homogeneous, too.

RESULTS

Results of the achievement test

As soon as the experiment ended and students' grades were registered, T. Test for the independent samples was used to check whether there was a significant difference between the gain ratio of students' grades in the two experimental groups regarding the achievement test. Table (4) shows the results.

Table 4. Significance of the Modified Gain Ratio of the two Experimental Groups in the Achievement Post-Test

Group	N	M	SD	Mean Difference	T. Ratio	Sig.
Experimental Group 1	25	15.3200	2.32236	4.60	4.60	.044
Experimental Group 2	25	19.9200	1.44106			

Table (4) indicates that the gain ratio of both experimental groups was significant. The difference between groups' gain ratio was (4.60). Mean of students' grades in the first group who learnt by search engines was (15.32) whereas the mean of students' grades in the second experimental group was (19.92). In other words there was a statistically significant difference ($\alpha=0.05$) between the achievement of students in both groups in favor of the second group. This result asserts the importance of using LOR in the development of students' cognitive achievement in the Pattern Making Basics course.

Results of the Product Evaluation card

Once again, T. test for the independent samples was used as soon as the experimentation ended and students' grades were registered, to test whether there was a significant difference between the gain ratio of students' grades in the two experimental groups with regard to the Product Evaluation Card. Results are shown in table (5).

Table 5. Significance of the Modified Gain Ratio of the two Experimental Groups in the Post- Application of Product Evaluation card

Group	N	M	SD	Mean Difference	T. Ratio	Sig.
Experimental Group 1	25	15.0800	2.53180	8.16	13.403	0.038
Experimental Group 2	25	23.2400	1.69017			

Table (5) indicates that the gain ratio of both experimental groups regarding the Product Evaluation Card was significant. The difference between groups' gain ratio was (8.16). Mean of students' grades in the first group who learnt by search engines was (15.08) whereas the mean of students' grades in the second experimental group was (23.24). In other words there was a statistically significant difference ($\alpha=0.05$) between students in both groups regarding their Pattern Making Skills in favor of the second group. This result asserts the importance of using Learning Object Repositories LOR in the development of students' Pattern Making Skills in the course of Pattern Making Basics. To have a look at samples of students' products and make comparisons, see figures from 2- 9.



Figure 2. Front Bodice Draft, Pattern Plot and Manipulation produced by the first experimental group

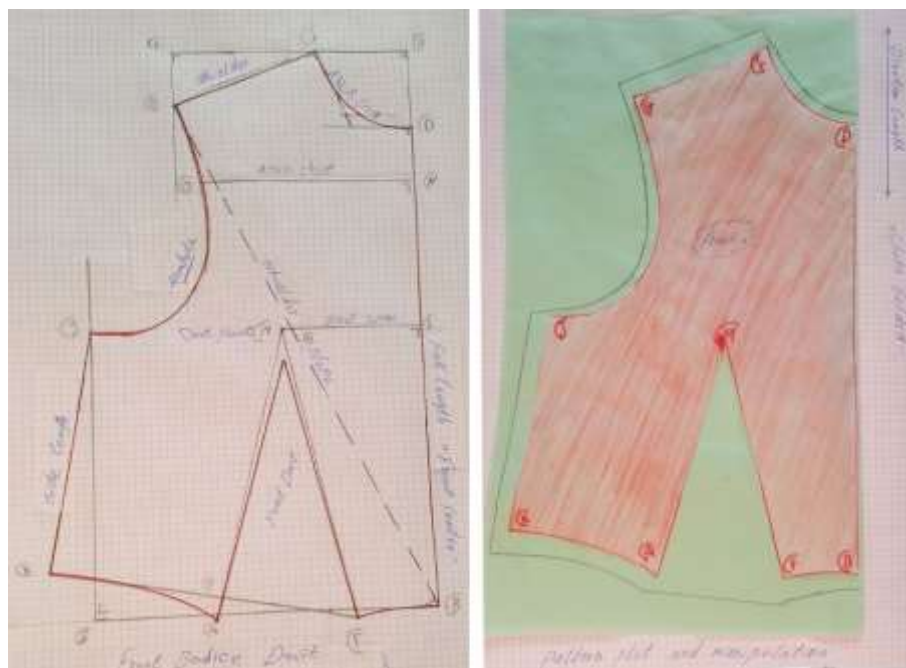


Figure 3. Front Bodice Draft, Pattern Plot and Manipulation produced by the second experimental group



Figure 4. Back Bodice Draft, Pattern Plot and Manipulation produced by the first experimental group

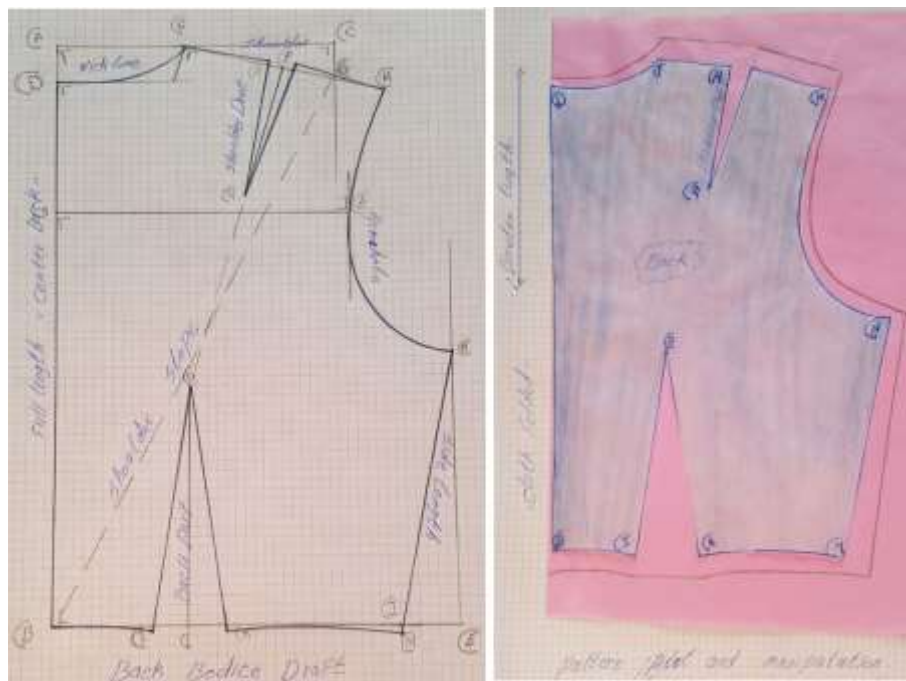


Figure 5. Back Bodice Draft, Pattern Plot and Manipulation produced by the second experimental group

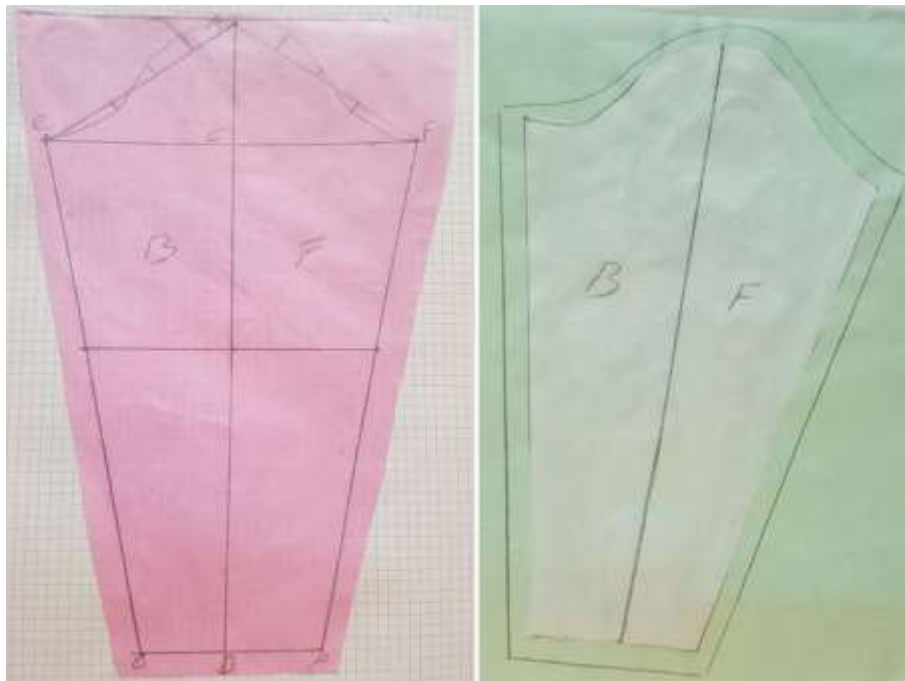


Figure 6. Basic Sleeve, Pattern Plot and Manipulation produced by the first experimental group

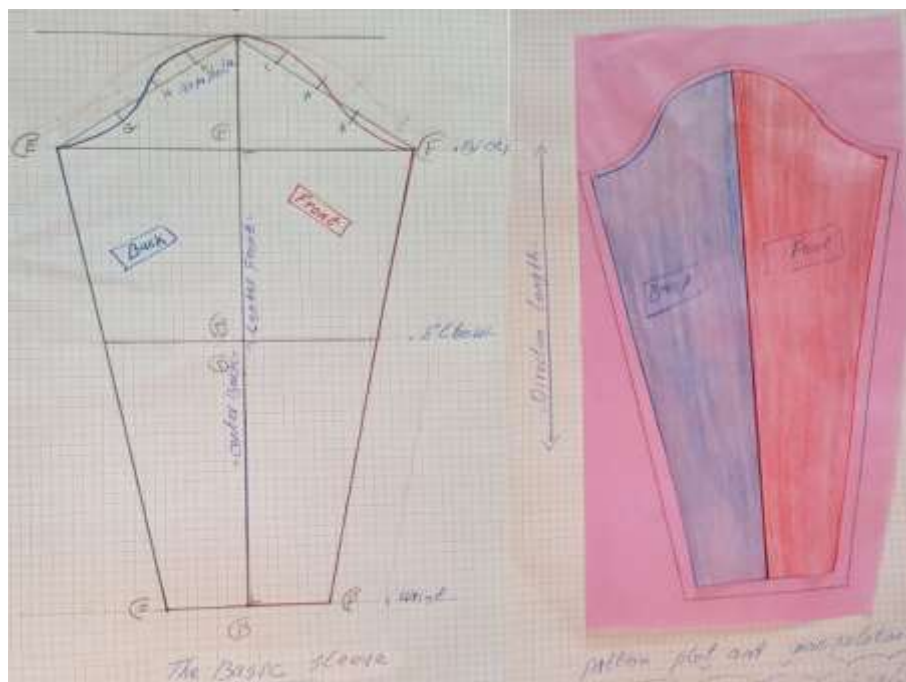


Figure 7. Basic Sleeve, Pattern Plot and Manipulation produced by the second experimental group



Figure 8. Skirt Draft, Pattern Plot and Manipulation produced by the first experimental group



Figure 9. Skirt Draft, Pattern Plot and Manipulation produced by the second experimental group

Figures (2- 9) show that students in the second experimental group paid attention to curves like neckline and armhole. They well-used French curve to draw them. Figures also show that lines are carefully drawn. Attention was paid to perpendicular angle and the used scale of map was well- controlled. Front and back in drawing are clear in the products as shown in the figures. Furthermore, the finishing way on the patterns is correct and in the direction of fabric's length. In addition, cut seam are well defined. While, productions of students in the first experimental group were not too convenient. Curves reveal that curve ruler was not used and so curves were

not well-drawn and inappropriate. There is a clear faulty in drawing the straight lines. Perpendicular angles are not controlled and inappropriate. Data on drawings were not enough to indicate pattern lines accurately. French curve was not used to well draw the skirts or pattern lines. The ways of fixing the patterns on the fabrics were not accurate and sometimes wrong in some patterns like for instance, basic sleeve. Cut seams were not clearly defined and have many mistakes, too.

DISCUSSION

The present study aimed to find out the impact of LOR in the achievement and development of pattern making skills of students at the department of home economics at Najran University. Findings revealed a significant difference between the means of both experimental groups regarding their academic achievement in favor of LOR use. Findings also revealed a significant difference between the means of both groups regarding the evaluation of their product in favor of LOR use. These results can be due to the fact that the repository is simple to use and enables students to browse the content easily. Furthermore, the interaction that was made between students and the learning objects available in the repository has stimulated and motivated students to develop their pattern making skills. In addition, the freedom that was allowed to students to choose their entry dates and browse the repository could help in developing students' academic achievement and pattern making skills significantly. The ability to re-use the downloaded learning objects without Internet connections could increase flexibility to use the repository content at any time. Finally, it could be claimed that LOR as a repository for learning object was effective and fulfilled students' needs because of the objects' variation that took into consideration students' individual difference. These findings corroborates the findings of Nash (2002), Cenchinel and Alonso (2011), Caws, et.al. (2006), and Margaryan and Littlejohn (2007) in accordance with the effectiveness of LOR as a learning teaching approach.

CONCLUSION

This study examined the impact of e-learning object repository to develop pattern making skills of students at home economics department at the college of education at Najran University. The study concluded that there was a significant difference between the modified gain ratio for students' grades in both groups regarding their academic achievement and pattern making skills in favor of the both experimental groups. Therefore, stakeholders are called to pay much attention to the adoption of LOR use in the university curricula because of its benefit in serving educational aims. University students at home economics should be trained to use LOR in their learning as so repositories of Learning objects should be integrated in the university courses. Besides, faculty members, should be trained to use LOR to develop their own skills before trying to develop students' skills. Finally, universities should have a general frame to generate the benefit of the learning object repository in various university institutions.

ACKNOWLEDGMENT

The research is funded by the Deanship of Scientific Research at Najran University and holds the agreement number NU/SHED/14/028. The researchers are greatly indebted to the deanship of scientific research at Najran University for funding this study and the provision of any required help. The researchers are also grateful for all students who took part in this study.

REFERENCES

- Albarrán, M. and Díaz, G. (2009). Recommendation and Students' Authoring in Repositories of Learning Objects: A Case-Based Reasoning Approach, *IJET*, 4(1). doi:10.3991/ijxx.vxxn.xxxx
- Cafolla, R. (2002). *Project Merlot: Bringing peer review to web-based educational resources*, Proceedings of the USA Society for Information Technology and Teacher Education International Conference, 614– 618.
- Caws, C., Friesen, N. and Beaudoin, M. (2006). A New Learning Object Repository for Language Learning: Methods and Possible Outcomes. *Interdisciplinary Journal of Knowledge and Learning Objects*, 2, 111-124.
- Cechinel, C. and Sánchez. S. (2011). Analyzing Associations between the Different Ratings Dimensions of the MERLOT Repository, *Interdisciplinary Journal of E-Learning and Learning Objects*, 7, 1-9.
- Downes, S. (2004). *The learning marketplace: Meaning, metadata and content syndication in the learning object economy*, Moncton: New Brunswick. Retrieved from <http://www.downes.ca/files/book3.htm>
- Harman, K. and Koohang, A. (2005). Discussion board: A learning object, *Interdisciplinary Journal of Knowledge and Learning Objects*, 1, 67-77.
- Kaczmarek, J. and Landowska, A. (2006). Model of Distributed Learning Objects Repository for a Heterogenic Internet Environment, *Interactive Learning Environments*, 14 (1), 1– 15.
- Koppi, T., Bogle, L. and Bogle, M. (2005). Learning objects, repositories, sharing and reusability, *Open Learning*, 20 (1), 83–91.
- Lehman, R. (2007). Learning Object Repositories: New Directions for Adult and Continuing Education, *Wiley Periodicals*, 113, 57- 66.
- Margaryan, A. and Littlejohn, A. (2008). Repositories and communities at cross-purposes: issues in sharing and reuse of digital learning resources, *Journal of Computer Assisted Learning*, 24, 333–347.
- McGreal, R. (2004). Learning objects: A practical definition, *International journal of instructional technology and distance learning*, 1 (9). Retrieved from http://www.itdl.org/Journal/Sep_04/article02.htm
- Monge, S., Ovelar, R. and Azpeitia, I. (2008). Repository 2.0: Social Dynamics to Support Community Building in Learning Object Repositories, *Interdisciplinary Journal of E-Learning and Learning Objects*, 4, 191-204.
- Nash, S. (2005). Learning objects, learning object repositories, and learning theory: Preliminary best practices for online courses, *Interdisciplinary Journal of Knowledge and Learning Objects*, 1, 217-228. Retrieved from <http://ijklo.org/Volume1/v1p217-228Nash.pdf>
- Ochoa, X. (2011). Modeling the Macro-Behavior of Learning Object Repositories, *Interdisciplinary Journal of E-Learning and Learning Objects*, 7, 25-35.

- The JORUM Team. (2006). *E-learning Repository Systems Research Watch*. Retrieved from http://www.jorum.ac.uk/wp-content/uploads/2015/01/Jorum_E-Learning_Repository_Systems_Research_Watch_2006.pdf
- Wang, S. (2008). Ontology of Learning Objects Repository for Pedagogical Knowledge Sharing, *Interdisciplinary Journal of E-Learning and Learning Objects*, 4, 1-12.
- Wikipedia, (n.d). *Pattern (sewing)*. [https://en.wikipedia.org/wiki/Pattern_\(sewing\)](https://en.wikipedia.org/wiki/Pattern_(sewing)) accessed on 29/12/2015 .
- Wiley, D. A. (2000). Learning object design and sequencing theory, *Unpublished PhD Thesis*, Brigham Young University.
- Wiley, D. A., and Edwards, E. K. (2002). Online self-organizing social systems: The decentralized future of online learning, *Quarterly Review of Distance Education*, 3(1), 33-46.
- Yahya, Y. and Sarip, M. (2008). *LOR IuMET: Learning Object Repositories Interoperability using Metadata*. Retrieved from <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4632054>
- Yalcinalp, Se. and Emiroglu, B. (2012). Through efficient use of LORs: Prospective teachers' views on operational aspects of learning object repositories, *British Journal of Educational Technology*, 43(3), 474-488.