Proposal of Reproductive Design Education based on Knowledge and Resource Discovery through SNS Community

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ABSTRACT

Design education is one of the most creative topics and themes in Higher Educations and Trainings. Students of the design education course also need to learn both of knowledge and techniques, the former is necessary to design some objects and the latter are essential to utilize tools as well as equipments. It is important to provide not only knowledge but also techniques in efficient and effective ways.

One of the most attractive approaches to design in Ecological and/or Recycling methods is to utilize and discover reproductive tools and resources. It is a good way to create some reproductive objects. Especially, some furnitures are worth enough to be reused and reproduced in the above ways.

This study focuses how to utilized recycling resources and useful knowledge for design education. And it also presents a practical scheme to utilize Resources, Knowledge and Techniques for Design Education in order to retrieve and discover in network environment. The paper challenges to visualize practical scheme for design process by means of comparison between usual steps in the normal design education and special steps using Internet and/or SNS-based network community. And it summaries to be important for design education to visualize scheme for resources and knowledge discovery through network environment.

KEYWORDS

Visualization of Design Education, Ecological and Recycling, Utilization of Network Community for Retrieving and Discovering.

1 INTRODUCTION

Education, especially Design education, needs combination of knowledge, technique and exercise. Because students of the relevant education course must have suitable knowledge to design some objects as well as applicable techniques to produce original shape and structure for the self-designed objects. In order to grow their knowledge and techniques during the effective course, students, namely learners want to face some practical designing and producing situation as exercises which shall be able to provide very important experience for the relevant students/learners.

If they find themselves in successful results, they will really gain possession of skills, great experience, self-confidence and moreover applicable challenging spirits for other targets. In these cases, there may be some problems how to support and realize their fruitful courses and how to reduce/shorten their reasonable periods for the total length of courses. Many students/learners need different knowledge and materials and they want to face several kinds of target and plans to design and implement their objects.

This research has focused on utilization of network community to quest for suitable knowledge and discover desired resources in order resolve given/own problems. Network sometimes shows a lot of scenes to its users, from domestic LAN to wide WAN namely Internet. Currently, social networks become more and more applicable for the users to achieve information sharing and exchanging.

This paper introduces brief comparison of conventional and our proposal design education with network community and benefits in the second section. It explains characteristics and advantages of our practical design education for reproductive scheme with recycling resources and
its ecological manner in the third section. It also describes some evaluations of our design education and mentions its future expansion for Internet-wide scale in the fourth section. And it finally summaries our concluding remarks in the fifth section.

2 RELATED WORKS

This section reports four useful articles of related works of ours. These articles focuses on case study about how to utilize SNS community for information sharing, decision making and so on. Sue Yeon Syn from The Catholic University of America and Sanghee Oh of Florida State University report why SNS (social network site) users do share information, knowledge and experience on Facebook and Twitter [1]. Their study examined why SNS users shared information, knowledge, and personal experiences with others on SNSs. Through an online survey, 10 motivation factors were tested with Facebook and Twitter users. Their findings indicated that the motivations of SNS users in sharing information could be attributed to various aspects such as demographic characteristics, experiences of SNSs and Internet usage, as well as the characteristics and features of SNSs. SNS users could be highly motivated by the learning and social engagement aspects of SNS services. They also found that the motivations could vary depending on the characteristics of services. They said that results of their study could be helpful for researchers in understanding the underlying reasons for social activities as well as for SNS developers in improving SNS services.

Slava Kisilevich from University of Konstanz, Germany et al. reported that online social network services (SNS) provided an unprecedented rich source of information about millions of users worldwide [2]. However, most existing studies of this emerging phenomenon were limited to relatively small data samples, with an emphasis on mostly "western" online communities (such as Facebook and MySpace users in Western countries). In order to understand the cultural characteristics of users of online social networks, their paper explored the behavioral patterns of more than 16 million users of a popular social network in the Russian segment of the Internet, namely, My.Mail.Ru (also known as "My World" in Russian). Their main goal was to study the self-disclosure patterns of the site users as a function of their age and gender. Their paper compared the findings of their analysis to the previous studies on Western users of SNS and discussed the culturally distinctive aspects. Their study highlighted some important cultural differences in usage patterns among Russian users, which called for further studies in SNS in various cultural contexts.

Ohbyung Kwon and Yixing Wen from Korea explained Social network services which were emerging as a promising IT-based business, with some services being provided commercially such as Facebook [3]. However, it was not yet clear which potential audience groups would be key social network service participants. Moreover, the process showing how an individual actually decided to start using a social network service might be somewhat different from current web-based community services. Hence, the aims of their paper were twofold. 1) They empirically examined how individual characteristics affected actual user acceptance of social network services. To examine these individual characteristics, they applied a Technology Acceptance Model (TAM) to construct an amended model that focused on three individual differences: social identity, altruism and telepresence, and one perceived construct: the perceived encouragement, imported from psychology-based research. 2) They examined if the users’ perception to see a target social network service as human relationship-oriented service or as a task-oriented service could be a moderator between perceived constructs and actual use. They said their result discovered that the perceived encouragement and perceived orientation are significant constructs that affected actual use of social network services.

Tristan Henderson, Luke Hutton & Sam McNeilly of University of St Andrews, UK reported about “Ethics in online social network research” [4]. They described that Social network sites (SNSs) and other online social networks such as Facebook and Twitter represented a huge source of data for research in many fields, including sociology, medicine, anthropology, politics and computer science. Such sites might contain sensitive
information and care needs to be taken when designing experiments or collecting SNS data. This case study outlined two such experiments and discussed the ethical concerns within. They described lessons learned, a set of experiments designed to test some of these lessons, and an architecture that addressed some of the ethical challenges. From these articles, it is confirmed that we had better utilize knowledge and techniques of SNS community. And at the same time we must choose and/or determine more useful and reliable ones among the proposed knowledge and information from SNS community.

3 COMPARISON OF CONVENTIONAL AND PROPOSAL DESIGN EDUCATION

This section compares our proposal design education with a conventional one and explains the latter's characteristics against the former's one.

3.1 Real Production Process for Furniture

A real production process of furniture includes the following steps;

1. Design of the target furniture: normally, some prototyping is necessary in the design process. Making miniature is a part of prototyping. It is convenient for overviewing such a target furniture.

2. Discussion of the target furniture: Designer and sale manager discuss the profile about the target furniture by means of miniature as a prototype. Some sale plan is to be prepared by means of prototyping, namely using miniature.

3. Production of the target furniture: After prototyping and discussing, producing process begins in accord with previous processes. Display and trial usage will be available with finished product.

Figure 1 shows prototyping a miniature of reference furniture on the work desk. In this case, prototyping includes coloring of miniature. Suitable coloring may be good for the sake of giving reality to miniature. Scaling of miniature will be from 1/10 to 1/8 possibly.

Figure 1. Display and evaluation with miniature of furniture.

Figure 2 presents the according miniature of furniture with the same kind of miniature of seat sofas which have been made up of "foam polystyrene" because of easy forming. Such a prototype, however, may give someone a quality feeling so that some people say there is no special need to utilize Virtual reality rendering with expensive effect by computer.

Figure 1. Prototyping and coloring of miniature for target furniture.

Figure 3 displays a real model of furniture which is produced based on miniature after prototyping. A real model must be good and useful if previous
Prototyping is well-discussed and suitable enough to produce real furniture.

**Figure 3.** Production of furniture based on miniature.

As comparison with Figure 2 and Figure 3, not only designer but also sale manager can feel that real production is identical with prototyped miniature. As a consequence, potential buyers who may stand at the same position of sale manager can recognize and decide to pay their costs to buy the relevant furniture only through reference of prototype. As you know, not a few people sometimes buy products only with reference of catalogs or online browsing, instead of touching and checking real model.

### 3.2 Proposal of Reproductive Design Education using SNS Community

Network communities have been attractive and useful for us to perform information exchanging and sharing among the registered people who are living in the distance. If one describes some resource is unnecessary in one's community, others may rely those resources must be necessary in the other's community. And if one asks some questions which need knowledge to be resolved, others may reply the relevant answers which include suitable knowledge for resolution. SNS community is one of the efficient and effective environments which can transfer information to the relevant position/people.

In order to perform resource recycling and discovering, it is very good to utilize SNS community and carry out information exchanging and sharing on the networks.

In the case of our proposal design education, recycling resources of materials has been focused and illustrated in order to reproduce some useful products with recycled resources. We will explain sample of utilization of SNS community, decision making on the networks (i.e. resource finding, knowledge obtaining to redesign, presenting by miniature, discussing, etc.), reproduction of real model, and evaluation.

Generally speaking, reproduction of furniture may be included with the following procedures, namely,

1. Designer reforms his/her original model into a new one, which has both of a part of the same resources of the original model and other new parts.
2. The designer must decide to keep what part of original resources and to design others newly.
3. In order to decide to keep what part of original resources, it is necessary to retrieve past results. On the other hand, in order to decide to create new part, it may need to search future trends, namely, prediction of trend.
4. The former must utilize retrieval of past track records just like as one of database applications, while the latter had better employ market research, trend watching, questionnaire investigation for users and so on.

Of course, it is very difficult for only one or a few designers to manage the above procedures efficiently. Several staffs and/or support team must be necessary for such designer(s).

We describe schematic procedure for reproduction during Design Education using SNS community in order to improve effectiveness and efficiency educational results.

- In order to accomplish retrieval of past track records, we have utilized SNS community. Such a community can play important roles to provide huge and excellent database for retrieving.
- We have also utilized SNS Community to perform market research, trend watching,
questionnaire investigation, and user's demands. Probabilistically speaking, small size of SNS community may have not large demands but steady ones even for productions.

- We have employed SNS community as suitable media to perform information sharing and exchanging. Namely, some members of Social networks may be able to provide and/or point out both of resources and know-how for reproduction in Design Education.
- As described before, values of people may be not similar and identical. If so, it must have possibilities that something which is unnecessary for someone is necessary for other ones from the global viewpoints.
- Especially, recycling will be more and more popular in many fields and probably be dominant. Production, such as furniture, has relatively long lifetime such as 10 years or more, so those resources may be useful and available for multiple generation users. The problems are how to adjust changes and variation of their tasty, favorites and trends.

4 ADVANTAGES OF PROPOSED DESIGN EDUCATION

This section demonstrates characteristics and advantages of our proposed design education showing practical reproduction processes of furniture as a sample of recycling resources. It also includes workflow of real reproduction, explanation of detailed stages for reproduction and modeling of knowledge and resource discovery using SNS community.

4.1 Workflow of Practical Reproduction

First of all, workflow of reproduction of furniture can be summarized as follows. Such workflow utilizes resources and know-how using SNS-based human relation. All the operations and functions are especially geared towards SNS and intended for users of the relevant SNS community.

1. Furniture Designing stage:
   A) Analyzing needs/demands
   B) Choosing kinds of furnitures
   C) Determining kinds of materials

2. Resource Finding stage:
   A) Requesting information about furniture to be constructed
   B) Requesting information about materials of the furniture
   C) Searching resources for materials/furniture
   D) Obtaining information about resources
   E) Obtaining information about resources

3. Knowledge Collecting stage:
   A) Requesting information how to fabricate, manufacture and/or process such resources
   B) Searching knowledge for fabrication, manufacturing and/or processing
   C) Obtaining knowledge about the above techniques
   D) Accumulating knowledge like database

4. Furniture Constructing stage:
   A) Selecting staffs and/or work places
   B) Pouring resources and know-how into the above factory (i.e. workplace with staffs)
   C) Reproducing the relevant furniture

The above workflow can be separated into 4 major stages, which includes some more detailed steps.

4.2 Reproduction Modeling for Proposed Design Education with Knowledge and Resource Discovery in SNS Community

We have utilized SNS community in order to obtain "Requests", "Resources", "Knowledge" and "Announcement" for Modeling for Proposed Design Education. Our sample is to reproduce some furniture using Knowledge and Resource. They can be retrieved and discovered in SNS community.

At first, we have established Human relation for demand analysis, trend retrieval, decision making, and so on. SNS is powerful and reliable for us to achieve our aim relatively in a short period. They are very useful and suitable to perform information sharing and exchanging in convenient ways.

Figure 4 shows such human relation realized in SNS community such as in Campus network environment. Of course such a community may
not be limited to local and/or domestic community in the same campus (College and/or University). It can be more widely spread and enlarged like SNS, for example, Facebook[5], Mixi[6] and/or Twitter[7].

In the case of reproduction of furniture, it is very much necessary to find useful resources efficiently. With utilization of SNS community, resource discovery can be carried out more easily than others, which is shown in Figure 5.

If a user asks his colleagues in SNS community whether convenient resources exist close to them or not, some colleague replies his/her information about according resource. Of course, it is possible that others do not reply in a short period nor reply only they know nothing about such resources. Probably suitable resources will be found potentially in a short period through human relation established with SNS community. This is an example of "Resource Discovery through SNS community".

In the same manners, if a user wants to obtain some tools and know-how to re-produce furniture efficiently, he asks his colleagues, "Does anyone know where suitable tools are?" or "Does anyone have adequate information how to re-produce such kind of furniture?" This is also an example of "Knowledge Discovery through SNS community". Figure 6 shows that a user has obtained a necessary tool from SNS community and he/she can use the relevant tool for Design Education in order to achieve his/her purpose in a short period.

If a user is a beginner of our Proposed Design Education who cannot re-produce such a furniture by himself, he may want to know how to (re-)produce good furniture with his resources. So he needs several kinds of knowledge to use resources and to handle tools effectively and efficiently. As you know, by means of SNS community, such a user may obtain suitable know-how to achieve his/her purpose. He/She can re-produce furniture with his/her material discovered in SNS.
community by means of utilization of Know-How which can be also discovered in SNS community. Such a scheme is conceptually illustrated in Figure 7.

Figure 7. Knowledge Discovery in SNS community.

Even a beginner of design education may sometimes be brought face-to-face with some related problems and then he/she must retrieve/utilize SNS community and solve them through such a community. In the case of reproduction of furniture as an example of design education, he/she does really re-produce furniture with powerful supports from SNS community. With help of good tools and suitable knowledge how to manipulate as well as timely discovered material, the relevant beginner can perform his/her duty as his/her task for design education to re-produce some kinds of furniture. Figure 8 shows that even a beginner can re-produce furniture by means of tools and knowledge discovered in SNS community. And he/she can accumulate not only all necessary techniques for tool manipulation but also knowledge about furniture reproduction through practical experience to use SNS community as well as to utilize resource, tools and knowledge. If needs are not very few, the next demands about furniture re-production may occur potentially. Such demands are steady and continuous so that it may be necessary to prepare some market research and securement of materials which are not only unused resources but also newly created ones.

Figure 8. Re-producing Furniture using Knowledge and Tools Obtained from SNS Community.

5 QUALITATIVE AND QUANTITATIVE EVALUATION FOR OUR PROPOSAL

This section reports two types of evaluation, namely qualitative and quantitative ones.

5.1 Reproduction Qualitative Evaluation for Reproduction of Furniture as Recycling Resources

As evaluation of reproduction of furniture described above, we explain the following three items, namely cost-performance, feasibility study and human-relation based activity.

- **Cost-performance:** Recycling of resources is positive but necessity to transport tools/resources/products is negative. The former is a good effect for ecology, cost-saving, and environmental protection. Resources for furniture are almost woods so their recycling can reduce some impacts from deforestation. Recycling also brings cost-saving normally. The latter is a bad effect for emissions of carbon dioxide through traffic increasing and all-too-easy way of borrowing tools and know-how. Emission of carbon dioxide must increase by means of
transporting resources and tools. If an imprudent person wants to participate in such SNS community, he/she frequently raises troubles based on borrowing tools and know-how in easier ways than other conventional approaches.

- **Feasibility study:** Our viewpoint for reproduction of furniture stands for the very best case to be performed. If some conditions are not satisfied, such reproduction cannot continue any more. For example, resources are necessary to be supplied in a low cost (although paying transport dues) and SNS community kindly provide know-how about relevant requests from users. In order to keep and satisfy the above conditions, we need to maintain and expand suitable human relation on SNS community. This may be one of most difficult problems!

- **Human-relation based activity:** Utilization of SNS itself must be a good idea and it can be expected to make our life styles more fruitful. Although one person does not carry out works, many persons can perform such works probabilistically. Namely, activities based on human relation will be identical to times of single person’s activity. It may be expected to have synergistic effect based on human relation through our practical experiences \([8][9]\). Anyway, it is necessary to lay out a well-suited goal to contribute to the maintenance of human relation on SNS community.

The above discussion has been limited to reproduction of furniture with recycling resources and tools/knowledge. But our concept may be applicable in other target of reproductive design education and finally suitable in practical design education schemes.

### 5.2 Quantitative Evaluation (PART I)

We have cordially asked 5 learners in reproductive design education to do feedback of correlation of themselves between their behaviors in SNS access and their corresponding satisfaction level based on utilization of SNS community for accomplishment during reproductive design education. This means whether it is useful for those 5 learners to get good satisfaction from Knowledge and/or Resource through SNS community for their practical reproductive design education. Table 1 shows the relevant result.

**Table 1.** SNS access times and Satisfaction level of 5 learners.

<table>
<thead>
<tr>
<th>Learner ID</th>
<th>Project 1</th>
<th>Project 2</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>times*</td>
<td>level**</td>
</tr>
<tr>
<td>#01</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>#02</td>
<td>3</td>
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<td>5</td>
<td>4</td>
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<tr>
<td>#04</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>#05</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

(NB) times* = SNS access times, level** = Satisfaction level.

For example, as shown in Table 1, each learner receives two types of projects and his/her maximal access times for SNS is 5 and his/her satisfaction level is expressed from 1 to 5 (1: bad, 5: very satisfied). Table 2 shows correlation between access times of SNS by learner and satisfaction level.

**Table 2.** Correlation between SNS access times and Satisfaction level.

<table>
<thead>
<tr>
<th>access times</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>0</td>
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<td>0</td>
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<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
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<tr>
<td>3</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

This may have been the first evaluation about reproductive design education through SNS community, because the more times of SNS access are increasing, the higher level of satisfaction is obtained by learner. So we have applied statistical analysis to Table 2 as the first quantitative evaluation for effectiveness of SNS utilization during reproductive design education. In order to confirm whether our approach can be significantly effective, we will perform chi-square test, namely \( \chi^2 \)-test for reduced version of Table 2, where the rows and columns contain all zero’s are
removed, as one of statistical analysis. The procedure is demonstrated as follows;

1. Calculating $\chi^2$, namely
   
   $\chi^2 = (2-2*2/10)^2/(2*2/10) + (0-2*2/10)^2/(2*2/10) + \ldots + (1-2*2/10)^2/(2*2/10)$

2. Obtaining $\chi^2 = 15.92$ from the above

3. Degree of freedom of Table 3 is $(4-1)*(4-1) = 9$

4. From $\chi^2$-distribution table, we can get chi-square percentile with degree-of-freedom= 9 at the 5% significance level and 10% one as follows;
   
   $\chi^2_{a=0.05}(9)$ at 5% level with 9 degree of freedom = 16.9 and $\chi^2_{a=0.10}(9)$ at 5% level with 9 degree of freedom = 14.7, respectively. In the above results of chi-square-testing, we can describe the following;

(a) If $H_0$: Scheme of our proposal is not useful at the 5% significance level ($\alpha = 0.05$) is a “null hypothesis”, based on expression:

   $\chi^2 = 15.92 < \chi^2_{a=0.05}(9) = 16.9$, at the 5% significance level, $H_0$ cannot be rejected.

Therefore, it can ‘not’ be confirmed that Satisfaction level is dependent on SNS-access times. In other words, the former may be independent from the later, namely, utilization of SNS services is not significantly dependent on obtaining satisfaction of learners at the 5% significance level ($\alpha = 0.05$).

(b) However, if $H_0$: Scheme of our proposal is not useful at the significance level ($\alpha = 0.10$) is another “null hypothesis”, based on expression:

   $\chi^2 = 15.92 > \chi^2_{a=0.10}(9) = 14.7$, at the 10% significance level, $H_0$ can be surely rejected.

Therefore, it can be confirmed that Satisfaction level is dependent on SNS-access times in this case. In other words, the former may be dependent on the later at the 5% significance level ($\alpha = 0.05$).

### 5.3 Quantitative Evaluation (PART II)

In order to investigate more precisely whether SNS-access times (namely, utilization of SNS services) are significantly dependent on obtaining satisfaction or not, after obtaining the above evaluation results, we have decided to carry out classroom-level questionnaire for larger numbers of learners at the end of design education. We have tried to evaluate quantitatively a scheme of our proposal through the second questionnaire again in order to obtain some certain eligibility of our proposal based on more scale of user size. Table 3 shows results of the above questionnaire.

**Table 3.** Another comparison of SNS access times and Satisfaction level for 15 learners.

<table>
<thead>
<tr>
<th>Learner ID</th>
<th>Times*+</th>
<th>Level**</th>
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<td>S02</td>
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<tr>
<td>S15</td>
<td>5</td>
<td>5</td>
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</tbody>
</table>

(NB) times*+ = SNS access times (if 5 and more, learners are requested to express only ‘5’ for convenient statistical analysis), level** = Satisfaction level.

Just like the same way as the previous analysis, we will demonstrate statistical analysis about the relation between utilization level of Knowledge/Resource Discovery through SNS community and learner satisfaction level for our real Reproductive Design Education. Table 4 shows correlation between access times for SNS community and the relevant satisfaction level.

**Table 4.** Correlation between SNS access times and Satisfaction level.

<table>
<thead>
<tr>
<th>Access Times</th>
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<th>2</th>
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<th>4</th>
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<td>0</td>
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<td>3</td>
<td>4</td>
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Based on Table 4, reduced correlation SNS access times and the relevant learners’ Satisfaction level for Reproductive Design Education is described in Table 5 and its auxiliary parameters for statistical analysis are calculated and contained in Table 6.

Table 5. Reduced Correlation between SNS access times and Satisfaction level for Table 4.

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<th>access times</th>
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<td>subtotal</td>
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Table 6. Auxiliary parameters for statistical analysis of Table 5.

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<td>4*8/15</td>
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</tr>
</tbody>
</table>

The procedure of \( \chi^2 \)-test for Table 5 with Table 6 can be expressed below just like demonstration in the previous 5.2 Quantitative Evaluation (PART I);

1. Calculating \( \chi^2 \), using parameters in Table 6, namely
\[
\]

2. Obtaining \( \chi^2 = 14.72551 \) from the above
3. Degree of freedom of Table 5 is (3-1)*(4-1)= 6 , because of row=3 and column=4
4. From \( \chi^2 \)-distribution table, we can get chi-square percentile with degree-of-freedom= 6 at the 5% significance level as follows;
\[
\chi^2_{0.05}(6) = 12.5916 , \text{nearly } [\chi^2] \text{ at 5% level with 6 degree of freedom.}
\]

In the above results of chi-square-testing, we can describe the following;
Assuming that \( H^+ \) [Satisfaction level of learners is independent from SNS-access times, namely utilizing SNS services] is a “null hypothesis”, then it is demonstrated below:
\[
\chi^2 = 14.72551 > \chi^2_{0.05}(6) = 12.5916, \text{ so that } H^+ \text{ can be definitely rejected at the 5% significance level } (\alpha = 0.05). \text{ Therefore, it can be surely confirmed that Satisfaction level of every learner is dependent on SNS-access times, namely, utilization of SNS services can be significantly dependent on obtaining satisfaction of learners. Our scheme of proposal for Reproductive Design Education is useful and effective for learners to perform Knowledge and Resource Discovery even at the 5% significance level } (\alpha = 0.05)]

6 CONCLUSION

This paper describes a practical model of Reproductive Design Education utilizing services based on Knowledge and Resource Discovery through SNS community. And it also explains the characteristics and advantages from scheme of our proposal for Reproductive Design Education in Detail. The paper illustrates a practical flow for proposed Reproductive Design Education utilizing several kinds of services from SNS community with comparison of conventional design process in design education. Knowledge, Resources, Tools obtained from SNS community can realize a fruitful reproductive design education. In the case of furniture reproduction, our proposed Reproductive Design Education has brought important and significant values to learners as well as their according SNS community. Such values include resource recycling, tool sharing, energy saving, cost-performance, knowledge retrieving/ mining and so on.

With the above discussion, it can be summarized in this paper as follows:

- Reproductive Design Education has provided the effect and evidence of recycling, ecology and cost saving.
- Reproduction of furniture, itself, as a good example of proposed Reproductive Design Education can play a certain role of utilization of services about Knowledge and Resource Discovery from SNS community.
- Reproduction, sharing and recycling with support from networks seems to be some case study of Resource and Knowledge Discovery through SNS community.
Qualitative and quantitative evaluation have been performed for limited members of learners as well as larger size of ones in classroom level. Results from qualitative and quantitative evaluation can allow us to consider that it is confirmed for our proposed scheme to provide learners’ satisfaction for Reproductive Design Education utilizing SNS community through Knowledge and Resource Discovery.

Our future plan is to provide more suitable educational schema and practical models for schools/institutes to employ more fruitfully and smoothly.

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