# The Development of e-Learning Platform for Gifted Children Education

**Sung-Wan Kim**

*Graduate School of Education, Ajou University, KOREA*

**Bong-Hyun Seo**

*Changyong Elementary School, KOREA*

*This study aims to design and develop the e-learning platform that supports the gifted children education and to evaluate the usability of the system. Through the literature reviews related with instructional models for the talented children education, one effective instructional model was developed for the gifted education, consisting of 4 phases such as general research activities, strategic enrichment activities, creative enrichment activities, and self-reflection & evaluation. Based on this model, an e-learning platform was designed and developed. 55 gifted students and 16 teachers who had participated in the gifted class utilizing the e-learning platform for 6 months evaluated the usability of system. It was founded that the platform was considered as appropriate in instructional support(learning guide & preparation, learner information guide, project support, interaction support, evaluation support) and technical support (easiness, accuracy, look & feel), although there were statistical mean differences between teachers and gifted students in evaluating it.*

**Keywords:** Gifted Children Education, e-Learning Platform, Project-Based Instruction

## Introduction

Gifted education is booming all over the world. Korea has also paid attention to the education of gifted and talented children under the goal of quality human resources development. The Korean government established its foundation by passing the Gifted Promotion Act in 2000 and the Enforcement Decree in 2002. According to the June 2003 report from the Korean Educational Development Institute, 0.28% of the entire elementary, middle, and high school student population were identified as gifted and were served by the gifted program (Seo, Lee, & Kim, 2005). In total, 40,000 Korean students received the gifted education, which corresponds to 0.56% of total students as of May, 2006.

As indicated by Plowman (1987), different types of instructional programs are needed for interactive and didactic education among instructors and gifted students, in which the learners have the active attitude searching for solutions for him/herself, rather than adhering to one-way instruction. Especially gifted children have the human traits of above-average abilities, high

level of task commitment, and high levels of creativity and it is required that these learners should be offered a wide variety of educational opportunities and services that are not ordinarily provided through regular instructional programs (Renzulli, 1978). That is, education generating new ideas should be served for gifted children rather than approach reproducing others' ideas. Accordingly, the content and method for gifted education must be different from general curriculum in the aspect of the level of content, kinds of curriculum, and expectations of end-products. Recommendable instructional methods include new task-based learning, inquiry learning, discovery learning, problem-based learning, instructor questioning, group investigation, one-to-one learning, and learning contract (Rogers, 2002).

When considering these characteristics, e-learning can be thought of as the appropriate instructional environment for excellent gifted children to do self-directed learning and solve problems. It overcomes the constraints of time and place, and provides an instructional environment corresponding with cognitive traits of gifted children. However, the existing e-learning in gifted education has limitations in offering the appropriate education for gifted learners because of just imitating the previous partial instruction. Most of e-learning systems supporting talented education just present tasks and function as a means of submitting completed tasks.

Up to now there have been some studies related to the e-learning system' potentials in gifted education. But those remained at the level of case studies and exploratory stage or just adhered to the rigid instructional phases (Kang et al., 2000). In this respect, it is required that the research should be done for designing and developing an e-learning platform for gifted children education, considering fully the characteristics of talented learners.

This study aims to design and develop the e-learning platform that supports the gifted children's education, to evaluate the usability of the system and to identify differences of perception on the usability of e-learning platform between teachers and students for the purpose of identifying whether teachers' perception has the same value with students' one.

## Effective Instructional Model for Elementary Gifted Education

As gifted students are exceptionally superior in their self-directed learning capabilities and attention to tasks to ordinary children, they need to be paid special attention in establishing educational goals for them, which should be essential to teaching methods, programs and evaluations (Van Tassel-Baska, 1997). In an effort to find instructional models that can be effectively adopted in assisting gifted education, general teaching and learning models for gifted education were initially reviewed as described in Table 1.

These models commonly say that the self-directed planning, processing and evaluating methods are prerequisite to the effective learning, stressing the importance of the self-decision on what the learner will study. They all point to the learning environment in which learners are provided with a variety of learning materials and methods, and an enriched learning can be conducted based on the self-found subjects of interest. Teacher's role gradually turns from a coach or instructor into a facilitator or a helper.

**Table 1**. *Major instructional models related with gifted education*

| Instructional model | Phase | Student's role | Teacher's role |
|---|---|---|---|
| Enrichment Triad Model (Renzulli, 1977) | . General exploratory activities<br>. Group training activities<br>. Individual & small group investigations of real problems | Active participator<br>↓<br>Problem investigators & solver | Planner & organizer<br>↓<br>Trainer<br>↓<br>Manager & sources |
| Autonomous Learner Model (Betts, 1985) | . Orientation<br>. Individual development<br>. Enrichment<br>. Seminars<br>. In-depth studies | . Active participator<br>. Planner<br>. Investigator | . Facilitator<br>. Resources<br>. Advisor |
| Creative Problem Solving Model (Parnes, 1987) | . Mess finding<br>. Data finding<br>. Problem finding<br>. Idea finding<br>. Solution finding<br>. Acceptance finding | . Active participator<br>. Idea generator | . Facilitator<br>. Resources |
| Self-directed Learning Model (Treffinger, 1981) | . Teacher-directed learning<br>. Self-directed learning stage 1<br>. Self-directed learning stage 2<br>. Self-directed learning stage 3 | Passive collector<br>↓<br>Selector<br>↓<br>Director of learning & evaluator | Instructor<br>↓<br>Provider<br>↓<br>Facilitator |
| Self-directed Learning Model (Grow, 1991) | . Learners of low self-direction<br>. Learners of moderate self-direction<br>. Learners of Intermediate self-direction<br>. Learners of high self-direction | Passive learner<br>↓<br>Self-directed learner | Trainer<br>↓<br>Motivator<br>↓<br>Facilitator<br>↓<br>Consultant |

The following Figure 1 [1] is a proposed table showing an effective instructional model for educating elementary gifted students, which is developed based on the teaching and learning models reviewed in the above. Based on Renzulli's Enrichment Triad Model (1977), this model is organized so that each phase including general research activities, strategic enrichment activities, creative enrichment activities, and self-reflection & evaluation, keeps circulating and

---

[1] At first we developed one model based on major instructional models related with gifted education (Table 1). Especially, we tried to focus on encouraging students' self-directed learning because gifted students are superior in self-directed capabilities to tasks to ordinary children (Van Tassel-Basks, 1997). To validate the model for elementary gifted education (Figure 1), we held consultative meetings three times, which consisted of two professors and four specialists & educators for gifted education and educational technology. After receiving feedbacks (e.g., Roles of teacher and student) from them, we modified our model several times.

also reflects the self-directed learning models proposed by Treffinger (1981) and Grow (1991).

| | Phase | Transition of Initiative in Instruction | Teacher's Activities | Students' Activities |
|---|---|---|---|---|
| 4th Phase | Self-reflection & evaluation | Learner -led | . Assisting with evaluation of final output<br>. Assisting with exhibition & presentation of final output | . Self reflection, overall evaluation<br>. Exhibiting & presenting final output |
| 3rd Phase | Creative Enrichment Activities | | . Leading to find new knowledge<br>. Helping learner employ his/her own learning method<br>. Mentoring by specialist | . Collecting(searching) data & sorting<br>. Hypothesis-building & verification<br>. Interacting with specialist<br>. Cooperative activities among small groups<br>. Reviewing report & modifications<br>. Organizing new knowledge |
| 2nd Phase | Strategic Enrichment Activities | Teacher - led | . Developing & improving various communications activities<br>. Guiding learning / research activities<br>. Guiding the use of data<br>. Guiding problem-solving ability & creativity | . Deciding research method<br>. Deciding research schedule<br>. Assigning roles of small groups<br>. Deciding report forms<br>. Establishing evaluation plan |
| 1st Phase | General Research Activities | | . Expanding scope of knowledge<br>. Introducing a variety of knowledge | . Searching & selecting study subjects<br>. Confirming study goals<br>. Recognizing problems to study<br>. Organizing small groups |

**Figure 1**. *An effective instructional model for elementary gifted education*

The first phase is 'general research activities' in which students are helped to experience a wide scope of knowledge and find their own areas of interest through learning contents provided off-line by schools for gifted students or the various learning materials offered on-line. In this stage, the learner relies on various learning activities and materials provided by the teacher, and continues to expand his or her scope of interest and the subjects for study. The learner seeks to further study into the subjects of interest and tries to acquire more information on them, while experiencing the importance of getting an expanded knowledge by linking thoughts with thoughts and information with information. In this stage, teachers have to provide the students with various subjects of learning, while letting them have more self-control to recognize what they already know, what they need to know, and what they want to know.

The second phase is 'strategic enrichment activities' in which the initiative of learning is transferred to the learners, and they take the leading role in studying. The teacher in this phase encourages communications among the students in order to enable them to decide the research method on their subjects of interest, and get a variety of problem-solving approaches. The students are encouraged to lead their learning activities through guidance on research methods

and materials, and also expected to either organize small groups or establish the overall learning schedules for conducting individual projects. In this phase, the discussion on the final output and the establishment of evaluation plans brings the strategic learning about the procedure of overall projects. The plans for learning activities can be continually modified, added, and defined for future supplementation. Also it is important to offer the optimum environment to check and monitor the learning plan at anytime.

In the third phase of 'generative enrichment activities', self-directed learning actively occurs through the generation of new knowledge and problem-solving. In this phase, the learners collect and sort the materials related with their learning, and produce the final output of the project through cooperative activities among small groups and interactions with specialists. Teachers, as helpers, assist their students with employing their own methods of studying through asking relevant questions and feedback, and also help them with the examination and modification of the output. Mentoring by specialists from the concerning areas is provided and an emphasis is now to be placed on the practical activities for self-directed problem solving. In this phase, research activities, field studies, experiments, hypothesis examinations or discussions that can contribute to the project learning in actual life are encouraged, and the students are also guided to continuously undergo self-examination and correction through reflection diaries or personal journals.

In the fourth phase of self-reflection and evaluation, students are encouraged to occasionally write what they experienced and felt during the learning process in their reflection diaries. Throughout this process of self-evaluation, students will be able to become self-directed and take self-control as the leader of the learning process, and by perceiving the changes occurring in their recognition during problem-solving process, they can also see their initial uneasiness or anxiousness turn into self-confidence and conviction. As the start of learning begins from the searching for problems and the self-decision by the learners themselves, teachers are expected to present the basic evaluation criteria and help the students with their learning process. Passing through the middle point of the learning process, the initiative of the process completely turns to the hands of the students. At this time of the stage, an overall evaluation should be conducted on the self-evaluations or the evaluations by the team, personal journals and reflection diaries. By admitting students to look at the evaluation materials, the materials can be used for the supplementation and correction while preparing for the following projects. The evaluation materials accumulated during the learning process can be useful in that they enable the teachers to perceive the changes being made in the learners and offer appropriate feedbacks, while the students can have opportunities to ponder upon themselves and accumulatively record the process of their self-examination. Evaluations keep occurring throughout the phases, as the four phases of this model presented herewith are only of circulatory nature, not of any hierarchy, and they are essential for revising the final output as well as for establishing the successive learning processes and selecting the learning strategies.

## Design and Development

To design an e-learning platform for supporting gifted children education based on project-based learning, several important things were considered as follows. At first, the

effective instructional model for talented children was applied into the system. As previously described, the model was designed for them to do general research activities, strategic enrichment activities, creative enrichment activities, and self-reflection & self-evaluation. Its purpose was to improve their self-directed learning competency and problem solving ability as well as to have an opportunity to construct new knowledge during class. Gifted learners can be more successful if they are allowed to pursue tasks that match their abilities and styles (Sternberg & Grigorenko, 1993). Secondly, it was considered that the system should be learner-centered environment for students to plan, process, and evaluate methods for themselves. Thirdly, instructional strategies were considered for internal motivation and learning consistency. It is intended that the learning environments should be provided for the gifted children to feel fun and internal values.

For general research activities, we provide e-classes that stimulate face-to-face in-depth study, e-project classrooms that offer various project topics in the subjects (e.g., math, science and English), and an e-knowledge menu. In order to effectively support each stage of strategic enrichment activities, creative enrichment activities, and self-reflection & evaluation, the learner is empowered to autonomously select project topics in the e-project classroom and the independent project learning-room. After approval of the selection, the learner is able to set up study plans regarding the chosen subject, to write self-reflection journals, to collect and analyze data, to create reports, and to conduct team-reviews and self-assessments. To support the enrichment activities, the teachers use menus such as the e-community, e-mentoring, and the bulletin board.

To develop the e-learning system for the gifted children education (www.e-youngjae.com), Editplus, PHP, HTML and Java Script were used. It uses Linux as an operating system. This system classified users as gifted children, common children, instructors teaching gifted children, teachers, parents, guests and mentors. It has five main menus such as e-class, e-project classroom, e-community, e-knowledge and e-mentoring. It also includes 'Learning Before Learning' which is a kind of manual helping learner's learning process, 'Rank' which offers learner's point ranking, 'Learning Support Center' which provides learning resources related with gifted education, and 'My Page' which offers learner's total learning information. Especially, 'e-mentoring' was made to utilize positively its potential because it can provide the meetings with mentors who are experts in related academic areas and support affective aspects as well as instruction (Kim, 2007).

Most e-learning systems that target ordinary students offer instructor-centered video contents or course-ware, but our system emphasizes learner-centered educational environment wherein gifted students can easily perform project-based learning and can be stimulated to continuous enrichment learning of the given subject. That is to say, this system is designed for project-based learning that is more appropriate for gifted children rather than non-gifted ones and is learning activities-oriented, not content-oriented.

**Figure 2.** *Main screen of e-learning system developed for gifted children education*

# Formative Evaluation

## Sample

The formative evaluation was performed to test the usability of the e-learning system developed. The participants were 16 teachers who had taught gifted children and 52 gifted children from regional community gifted class and N elementary school students. Teachers participating in usability test had taught gifted children more than three years. Most of the 52 gifted children had used computers for over 5 years and had more than average ability of computer literacy. 53.9 percent of them had experience of receiving gifted education and 80.8 percent of them experienced learning at a distance.

## Procedure

After developing the e-learning platform based on the instructional model for gifted education, we operated classes using this e-learning system for six months (June – December, 2007) to support the face-to-face gifted education. On-line classes were offered for each subject and users were able to perform tasks such as writing self-reflection journals, building student-student communities & teacher-student communities, providing study tasks, and submitting final reports. After completion of the classes, we conducted a usability test through a survey, which consisted of nine background questions[2], 32 Likert-scale statements and optional open ended questions.

---

[2] 52 gifted children took a self-assessment, which it tested their own perception of ability of computer use such as the word processor, presentation software, internet search tool, and multimedia program.

## Instrument[3] and Data analysis

The areas of usability test for an e-learning platform are largely divided into instructional support and technical support. Instructional support was composed of five subcategories (learning guide & preparation, learner information guide, project support, interaction support, and evaluation support) and technical support was made up of three subcategories including easiness, accuracy, and look & feel. The instrument used in this evaluation was developed based on the previous studies (Kim, 2003; Kim & Lee, 2007) and reviewed for content validity by three professors and six graduates majoring in educational technology. The questions in the test focused on whether this system supports each stage of the instructional model for elementary gifted education. The instrument comprised 32 items with five point Likert–type scale[4]. It has demonstrated overall internal reliability of .90 and .91 for teacher and student respectively. T-test was performed to examine the differences in usability perception of the e-learning platform developed in this study between teachers and gifted children. The answers to the open-ended questions were summarized according to the merits, shortcomings, and ideas of improvement for the system.

# Results

According to the results of survey about teachers' and students' perception on the usability of e-learning platform developed for gifted education, means were 4.40 and 3.88 respectively (Table 2). It indicated that most of them highly appreciated the system support in the aspect of instruction and technology. Also the data from the questionnaire was analyzed by paired t-test in order to test the statistical significance of mean differences of perception on the usability of the e-learning platform between teachers and students. That is why teachers and students may perceive the system's usability differently. Table 2 shows that there is significant difference in the perception between the two groups at the 0.01 level of significance ($t$=-4.24, $p<.05$). Students' score was relatively lower than teachers', although both teachers and students perceived the system to be appropriate. Accordingly, it suggested that ideas from students should be accepted affirmatively in designing the e-learning platform. Relatively students felt the system less useful than teachers did.

**Table 2.** *Result of mean differences between teachers and students in perception on usability*

| Group | N | Mean | SD | $t$ | Sig. |
|---|---|---|---|---|---|
| Teacher | 16 | 4.40 | .33 | -4.24* | .00 |
| Student | 52 | 3.88 | .46 | | |

*$p<.01$

---

[3] The usability test question, composed of 32 items, is available in the appendix.
[4] '1' means 'strongly disagree' and '5' does "strongly agree".

Also significant differences were found in both instructional support ($t$=-3.57, $p$<.01) and technical support ($t$=-4.01, $p$<.01) in Table 3. Significant differences were found on all sub-factors except learning guide & preparation ($t$=-2.00, $p$>.01) and evaluations support ($t$=-1.01, $p$>.01) presented in Table 4.

**Table 3.** *Result of Mean differences between teachers & students by sub-category in perception on usability*

| Sub-factors | Group | Case Number | Mean | SD | $t$ | Sig. |
|---|---|---|---|---|---|---|
| Instructional Support | Teacher | 16 | 4.39 | .50 | -3.57* | .00 |
| | Student | 52 | 3.91 | .36 | | |
| Technical Support | Teacher | 16 | 4.41 | .52 | -4.01* | .00 |
| | Student | 52 | 3.84 | .37 | | |

*$p$<.01

**Table 4**. *Result of mean differences between teachers and students by sub-category in perception on usability*

| Sub-factors | | Group | N | Mean | SD | $t$ | Sig. |
|---|---|---|---|---|---|---|---|
| Instructional Support | Learning guide & preparation | Teacher | 16 | 4.29 | 0.50 | -2.00 | .05 |
| | | Student | 52 | 3.91 | 0.69 | | |
| | Learner information guide | Teacher | 16 | 4.64 | 0.34 | -6.06* | .00 |
| | | Student | 52 | 3.91 | 0.62 | | |
| | Project support | Teacher | 16 | 4.52 | 0.34 | -4.71* | .00 |
| | | Student | 52 | 3.99 | 0.53 | | |
| | Interaction Support | Teacher | 16 | 4.43 | 0.43 | -4.05* | .00 |
| | | Student | 52 | 3.86 | 0.63 | | |
| | Evaluation Support | Teacher | 16 | 4.08 | 0.68 | -1.01 | .32 |
| | | Student | 52 | 3.89 | 0.66 | | |
| Technical Support | Easiness | Teacher | 16 | 4.31 | 0.41 | -3.07* | .00 |
| | | Student | 52 | 3.82 | 0.60 | | |
| | Accuracy | Teacher | 16 | 4.40 | 0.47 | -2.80* | .00 |
| | | Student | 52 | 3.90 | 0.65 | | |
| | Look & Feel | Teacher | 16 | 4.53 | 0.50 | -3.60* | .00 |
| | | Student | 52 | 3.82 | 0.74 | | |

*$p$<.01

With open-ended questions, we asked them to write the merits, shortcomings, and ideas of improvement for the system. We got the following responses.

**Table 5.** *Responses from Students and Teachers in Open-Ended Questions*

| | Student | Teacher |
|---|---|---|
| Strength | Many topics related with the subjects<br>Appropriate level of learning<br>Easy usage | Self-inquiry activity and In-depth study are good Interaction between students and teacher.<br>Giving the opportunity of reflection<br>Self-directed projects<br>Easy to download and upload<br>Good accessibility<br>Check student's understanding |
| Weakness | Interface design not good<br>Self-reflection journal not modified<br>Can't look at their own report<br>Uncomfortable in using the system<br>Function for reading, revising and deleting documents uploaded by students needed<br>Reply delayed<br>Lack of learning guide | Impossible to see resources after submission of report |
| Improvement | Interactive tool such as chatting needed<br>Schedule notice required | Admittance of other students' outcomes required<br>Personal space for student's project needed<br>Learning management function such as checking lists of task submitted<br>More clear & efficient evaluation methods |

## Conclusion

The purpose of this study was to design and develop the e-learning platform which supports the gifted education based on project-based learning in elementary schools, and to assess the perception of teachers and students about usability of the system.

The research findings are as followings. Firstly, the platform developed by this study can be considered to be effective for teachers who guided the gifted children. Teachers highly appreciated the system in the areas such as 'learner information guide', 'project support', and

'interaction support'. It seems that they received it affirmatively because the platform continued to manage the learning process of gifted children by bridging the separation of face-to-face class. However, teachers required more clear and efficient evaluation methods in that this system did not offer the criteria for evaluations of self-reflection diary, self-evaluation, team evaluation, and final product evaluation.

Secondly, this system can be perceived as effective for the gifted children who have participated in the self-directed learning. They highly evaluated the system in the areas such as 'learning guide and preparation', 'learner information guide', and 'project support', compared with other areas. It was required that 'interaction support' area should be complemented by utilizing a variety of communication tools including chat and SMS service.

Our conclusion is that the e-learning system developed in this research has the potential to be used at gifted children education because it can help them deciding on what the learner will study, planning and evaluating their own study and that we need to equally consider not only teacher's view, but also student's one in design e-learning system for gifted education.

A point of concern relates that most of teachers participating at this study had a lack of experience of teaching online. Thus the findings need to be interpreted cautiously. In future, further investigations are required to utilize learning content management system for offering gifted learners more highly individualized instruction and to provide the appropriate strategies for instructors guiding them according to their learning orientation and level of task commitment.

# References

Betts, G. (1985). *The autonomous Learner model for the gifted and talented.* Greeley, CO: ALPS Publishing.

Grow, G. O. (1991). Teaching learners to be self-directed: A stage approach, *Adult Education Quarterly, 41*(3). 125-149.

Hwang, S. M. et al (2006). *The research on classification of learners and development of e-learning service model based on learners' classification in e-learning environment.* Seoul: KERIS.

Kaplan, S. N. (1986). The grid: A model to construct differentiated curriculum for the gifted. In J. S. Renzulli (Ed.), *Systems and models for developing programs or the gifted and talented* (pp. 180-193). CT: Creative Learning Press.

Kang, S. H., Cho, S., & Kum, M. R. (2000). The plausibility of cyber gifted education: A casa study. *The Journal of Educational Information and Media, 6*(1), 49-70.

Kim, S. W. (2003). Development and validation of an evaluation tool for e-learning platforms. *Journal of Educational Technology, 19*(2), 211-238.

Kim, S. W. (2007). A study on e-mentoring system design for guiding learning after school. *Journal of the Korean Society of Computer and Information, 12*(5), 303-311.

Kim, S. W., & Lee, M. G. (2007). Validation of an evaluation model for learning management systems. *Journal of Computer Assisted Learning, 24*(4), 284-294.

Maker, C. J. (1982). *Curriculum development for the gifted*. London: Aspen Systems Cooperation.

Parnes, S. J. (1987). *Frontiers in creativity research: Beyond the basics*. New York: Bearly Limited.

Plowman, P. D. (1987). Preschool gifted children. *The Gifted Child Today, 10*(6), 24-26.

Renzulli, J. S. (1978). What makes giftedness? Reexaming a definition. *Phi Delta Kappan, 60*, 180-184.

Rogers, K. B. (2002). *Re-forming gifted education*. Scottdale, AZ: Great Potential Press, Inc.

Seo, H. A., Lee, E. A., & Kim, K. H. (2005). Korean science teachers' understanding of creativity in gifted education. *The Journal of Secondary Gifted Education, 16*, 98-105.

Sternberg, R. J., & Grigorenko, E. L. (1993). *Thinking styles and the gifted. Roeper Review, 16*, 122-131.

Tannenbaum, A. J. (1983). *Gifted children: Psychological and educational perspectives*. New York: Macmillan.

Tomlinson, C. A. (1995). Deciding to differentiate instruction in middle school: One school's journey. *Gifted Child Quarterly, 39*, 77-87.

Treffinger, D. J. (1975). Teaching for self-directed learning: A priority for the gifted and talented. *The Gifted Child Quarterly, 19*, 46-59.

Van Tassel-Baska, J. (1997). What matters in curriculum for gifted learner: Reflections on theory, research, and Practice. In N. Colangelo & A. Davis (Eds.). *Handbook of gifted education. Needham Heights* (pp. 126-135). MA: Allyn & Bacon.

## Appendix

## Usability Test Questions

| Items | Strongly disagree / disagree / average / agree / strongly a | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| 1. The guideline for learning process is well provided. | 1 | 2 | 3 | 4 | 5 |
| 2. User can easily upload and download materials. | 1 | 2 | 3 | 4 | 5 |
| 3. Information on methods and types of evaluation is well given, before learning, | 1 | 2 | 3 | 4 | 5 |
| 4. It is possible to manage the student's personal information. | 1 | 2 | 3 | 4 | 5 |
| 5. It is possible to check the learning progress of the students. | 1 | 2 | 3 | 4 | 5 |
| 6. The system can easily provide results of evaluation during class. | 1 | 2 | 3 | 4 | 5 |
| 7. The system can indicate learning participation rate. | 1 | 2 | 3 | 4 | 5 |
| 8. It presents a diverse range of project topics by category. | 1 | 2 | 3 | 4 | 5 |
| 9. The guideline for procedure of the projects is well provided. | 1 | 2 | 3 | 4 | 5 |
| 10. User can easily manage his or her schedule to solve problems. | 1 | 2 | 3 | 4 | 5 |
| 11. The system provides learning resource center. | 1 | 2 | 3 | 4 | 5 |
| 12. It is easy to perform self-directed and independent projects. | 1 | 2 | 3 | 4 | 5 |
| 13. User can discuss topics necessary for the project. | 1 | 2 | 3 | 4 | 5 |
| 14. It is possible to upload the final product of the project. | 1 | 2 | 3 | 4 | 5 |
| 15. It is easy for teachers or mentors to provide support. | 1 | 2 | 3 | 4 | 5 |
| 16. It is possible to respond appropriately to questions and responses from the student. | 1 | 2 | 3 | 4 | 5 |
| 17. Communication between the teacher and the student or among project team members. | 1 | 2 | 3 | 4 | 5 |
| 18. It is easy to move study locations. | 1 | 2 | 3 | 4 | 5 |
| 19. Menus for Student participation sufficiently provided | 1 | 2 | 3 | 4 | 5 |
| 20. It encourages students to participate in the evaluation. | 1 | 2 | 3 | 4 | 5 |
| 21. Learning evaluation methods are various. | 1 | 2 | 3 | 4 | 5 |
| 22. It is possible to evaluate not only the final result of the study but also the entire progress. | 1 | 2 | 3 | 4 | 5 |
| 23. The system is convenient to use. | 1 | 2 | 3 | 4 | 5 |
| 24. The system gives details of menu usage. | 1 | 2 | 3 | 4 | 5 |
| 25. The user can move between menus or within the site quickly and easily. | 1 | 2 | 3 | 4 | 5 |
| 26. It is easy to revise input mistakes. | 1 | 2 | 3 | 4 | 5 |
| 27. It gives information about accurate locations within the site. | 1 | 2 | 3 | 4 | 5 |
| 28. Descriptions in text and image are accurate. | 1 | 2 | 3 | 4 | 5 |
| 29. There are no misspellings in the text. | 1 | 2 | 3 | 4 | 5 |
| 30. There are no system errors. | 1 | 2 | 3 | 4 | 5 |
| 31. The system has look & feel design. | 1 | 2 | 3 | 4 | 5 |
| 32. Colors and shape of the system are helpful for learning. | 1 | 2 | 3 | 4 | 5 |