The Instructional Design Strategy of On-line Learning System for the Improvement of NCS Core Competency

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Abstract

In recent years the government offices and businesses have begun holding tests of the new employees' NCS core competency as part of their entrance examinations. Therefore most of Korea's colleges now include 10 NCS basic job skills courses in their general education curriculums, yet it is hard for the students to take the 10 units during their short college years. It is necessary to adopt the on-line learning system enabling the students to select necessary units to study and improve their competence. Based on the existing instructional systems, this study suggests the instructional design strategy of an on-line learning system for the students to improve the NCS basic skills by themselves.

Keywords: basic job skills, on-line learning system, NCS core competence, instructional design strategy, communication skill, basic foreign language skill

INTRODUCTION

In recent years Korea has proceeded with NCS (National Competency Standard) policy for the purpose of the national vocational education and promotion of human resources for the future creative economy. NCS is the standardized education system by the nation following the country's advanced industrial level to educate personnel with necessary knowledge and skills when performing the works at industrial sites [1]. In fact, at the entrance examinations when the companies hire new employees, NCS core competence tests are given nationwide making it a matter of urgency to educate NCS core competency. Many colleges have selected NCS basic job skills units in their general educational system. The students find it hard to learn all 10 units as part of their general educational courses. Some of Korea's industrial complexes have developed main texts and workbooks according to 10 competency levels, but teaching and learning methods of the curriculum by different levels are not completed. To overcome various problems caused by this incompletion, if the learners can select each competency unit through on-line learning system, their learning ability will be greatly improved. This study proposes this on-line teaching and learning curriculum and supports the education of NCS core competency by unit levels helping the students' motivation of learning and problem-solving skills.

NCS CORE COMPETENCY

NCS Core Competency Models

NCS Core Competency is the competency basically needed to carry out one's duties in most professions. It is used in a variety of terms such as core competencies, skills, basic skills, and basic job skills [7]. In NCS sites [9], 10 basic job skills are defined as shown in [Table 1] by dividing them by types.

Table 1: Definition of Basic Job Skills by Types

Types	Definition by Types
Communication Skill	It refers to an ability to convey meanings precisely to other people when conversing with each other or exchanging opinion through papers.
Mathematical Skill	It is an ability to understand accurately the meaning of the statistics, probability and the four fundamental arithmetic operations, and to apply them in the performance of one's duties at the workplace.
Problem Solving Skill	It is an ability to correctly recognize and address the meaning of the problems generated in businesses and

	do the basic thinking for problem solving.
Self-development Skill	It means a capability to manage and develop oneself in the business world.
Human Resources Management	It is a capability to efficiently utilize and manage needed resources when performing the tasks.
Interpersonal Relationship Ability	It means a competency to get along amicably not causing problems with people who may come into contact in the performance of one's duties.
Information-processing Capacity	It is an ability to take advantage of basic computer skills to leverage the necessary information collection and analysis.
Technical Ability	It is one's capability to understand easily and select technologies in the business world and apply the technologies in various situations.
Organization System Understanding	It refers to one's ability to understand an organization and the management of a system including international trend to seamlessly perform tasks.
Vocational Ethics	It means a right occupational sense, attitude and good manners needed for easygoing professional life at the workplace.

Subordinate Capabilities of Communication Skill

Communication Skill is an ability to understand what the others say by hearing the words and reading the script in the performance of one's duties and a capability to write or speak accurately through the script and language what he or she means. There are such subordinate capabilities as Understanding Documents, Documentation, Active hearing, Communicative Expressions and Basic Foreign Language Skills [8].

Out of 10 core competences, this study has selected and prepared a screen design of on-line learning system taking Basic Foreign Language Skills as a learning example as shown in [Figure 1] on page 6.

TEACHING DESIGN STRATEGY

Overview of the Study and Its Characteristics

The educational purpose of NCS core competency is to let the students find necessary basic job skills through on-line education system and learn and improve their basic job skills by themselves. In general, the study area is divided into language information, intellectual skill, exercise function, cognitive strategy, and attitude [2]. The NCS core competency education is focused on the areas of intellectual skill, language information, and attitude. In intellectual skill area, the learners describe and practice the problem solving processes and are introduced to direct performance of learning. In language information area by using graphics and narrations of learning contents the students' level of understanding can be improved through structuralization and schematization. In attitude area, by suggesting various cases, the learners' learning purpose and their information and intellectual skills can be developed. The following will suggest the teaching and learning models for the students to learn by themselves through learning contents, case studies and problems about the 10 units of NCS core competency.

Strategy of Learning Contents

In this chapter, based on the 9 teaching processes from lesson unit design methods suggested by Gagne-Briggs [3], we propose 6 event teaching designs including the selection stage from NCS basic job skills by the learner as follows.

1) The Selection Stage of Unit Ability: The 10 NCS Core Competency comprises communication skill, information-processing capacity, mathematical skill, problem solving skill, human resources management, technology ability, organization system understanding, interpersonal relationship ability, self-development skill and vocational ethics. Each student should choose one ability unit which he or she thinks is needed.

2) Preparation Stage: Each student gets ready to learn by confirming the overall aims of the lesson and each unit's detailed aims he or she has chosen in the previous stage. The composition of the screen in on-line system can increase the attention of the student by providing suitable intro pictures and design and unit names that go well with NCS basic job skills respectively.

3) Phased Learning Stage: The learning contents of each unit include multimedia elements such as texts, figures, illustrations, and also diagraming and structuralization. By intensifying the learning contents and questions the learner's interests can be increased gradually and the interaction between the learners and the contents can be intensified.

4) Case Study Stage: The learners can input their case studies about each lesson and their solutions during problem solving processes and they can see the results on the screen directly. Also, by mixing properly the ratios of objective and subjective questions the learners can understand better. The in-depth contents and application questions are dealt with. The learners should be able to understand clearly the aims and precautions of case studies.

5) Supplementary Intensified Learning Stage: The program can lead to mastery learning by presenting each unit's contents in summary and giving supplementary or intensified contents. The supplementary content contains important terminology and contents or gives reference information by using download buttons. In addition, when getting ready to close the learning process, the Professor character adds closing remarks of the whole learning process and stresses the importance of practice.

6) Finishing Stage: It is important to make sure that the learners don't get confused and are confirmed as to what they have to remember through online lectures and learn the main points and intensified tasks by giving professional advice. The learners themselves can solve problems by levels and get provided their problem-solving history and closely examine their academic achievements.

Learning Motivation Design Strategy

This chapter is about how to maintain the learner's motivation and interest in online system through Keller's 4 theories on ARCS [4].

1) Attention: For change and diversity, each learning scene uses texts, photos, animations, videos, data matrices representing a variety of audio and visual effects. Through the step-by-step connectivity of the learning content, the learners' attention gets concentrated and their inquiry effect gets better when they are provided with the animated episodes about possible experiences.

2) Relevance: Each unit provides learning aims and contents so that the students get ready for the learning. By composing animation cases about the entrance exams to the companies, especially regarding NCS basic job skills, the learners can concentrate better. Each learner will be able to do self-directed learning by making their own personal goals.

3) Confidence: Through orientation, the system gives guidelines about learning aims, development method of learning content, and necessary condition for learning progress in details. After each lesson, interesting questions are provided and the students have confidence in themselves.

4) Satisfaction: After each unit's learning activities, the system provides positive feedbacks such as appropriate sounds or messages on the success of learning activities. In the evaluation of learning, through detailed explanation and the student character's correct or incorrect actions, learning motivation can be strengthened. Also, the students feel confident as they are given questions with a high level of difficulty.

Interactive Design Strategies

Components that can interact in on-line systems are an instructor, learners, a system operator, and learning contents [5]. This chapter will explain things to consider in the design of the online screen.

1) Interaction between the Instructor and the Students: The students can give questions through Q&A bulletin board and the instructor should respond anytime through on-line. If a learner submits learning tasks through task sites, the instructor should correct the results. The task site provides supplementary materials to help the learning and leads to in-depth learning. Discussion sites can be used to submit reports or to receive correction from the instructor.

2) Interaction among the Learners: Anybody can see the student list through enrollment checking. Message boxes can be used to send messages to other students, share opinions, and say hello to each other. Team project function allows the learners to form a team, proceed case studies and evaluate each other. Discussion room makes it possible for the learner to print the subjects related to the learning contents and share ideas with other learners.

3) Interaction between the Learner and Learning Contents: Progress check makes it possible to ascertain learning progress through graphs and numbers and increases the learners' satisfaction, and lets them make learning plans by themselves. Orientation function provides basic interface and explanations about the lecture.

4) Interaction between the Learner and the Operator: Announcement site is the space where the learners make sure the contents the operator has given before learning. The learners can give questions about the contents, learning progress, and operation through Q&A site. Questionnaire functions getting the students' education satisfaction after the lesson and through the analysis of its weaknesses the result can be reflected in the future development.

SCREEN DESIGN OF THE ON-LINE LEARNING SYSTEM

The screen design of the on-line system uses the most universal and effective navigation system to improve the learning effectiveness and serviceability [6]. The learning part of [figure 1] is the one that provides learning contents. Case activity part is the one that explains and solves case study questions. Learning menu area represents the main learning processes and through this menu the learner's learning activities are made possible. Control bar area and mobile navigation area make the learner's minimum moving line possible. Besides, the interspace between the learner and the operator and the inter area among learners are suggested.
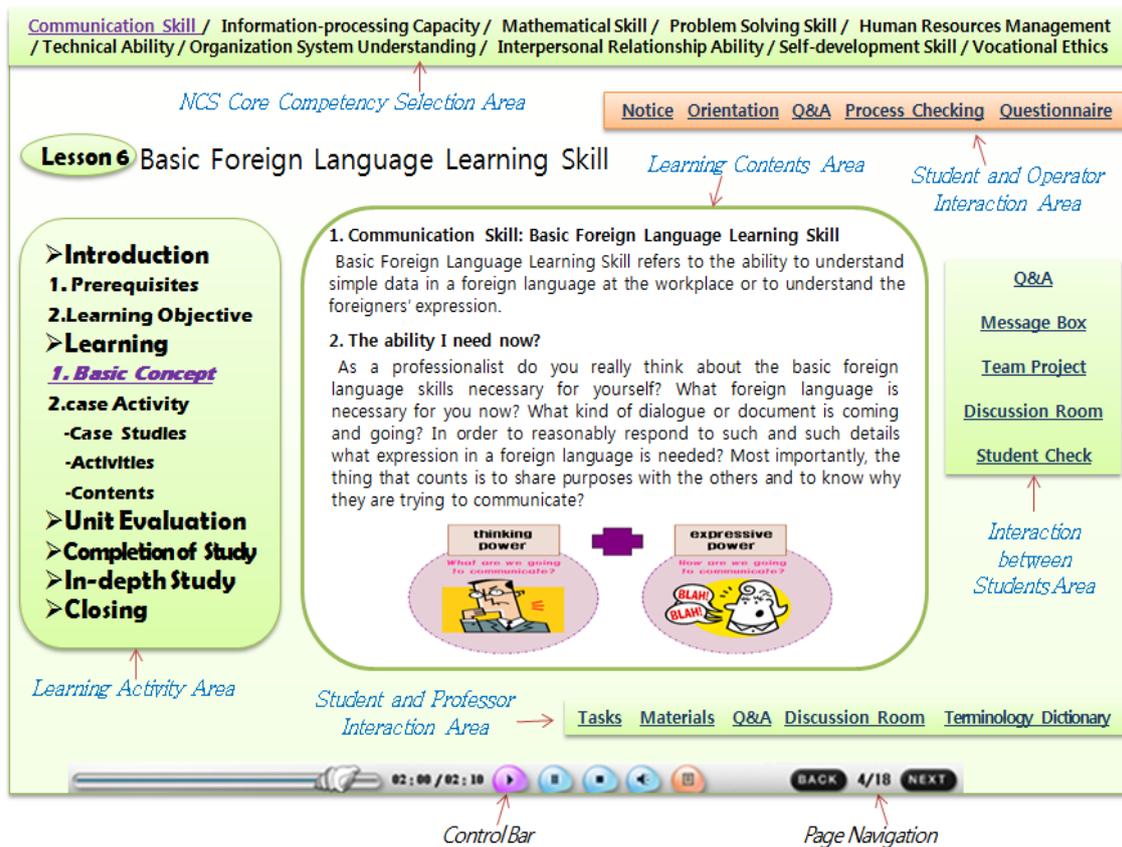
Figure 1: The Screen Design of the On-line Learning System[1]

In the evaluation part of units the instructor evaluates the students' participation and understanding by individuals and by teams, and check their presentation preparation level by giving excellent teams feedbacks, and lets outstanding examples present their cases and share their information.

In the intensified learning stage the system offers a supplementary explanation about each unit's case study, lets the students solve learning assessment questions and thus induces mastery learning. During lessons it also prepares and explains supplementary learning and offers further information such as multimedia course materials which do not exist in the textbooks. Furthermore, it has a function to highlight the possibilities of field application of the learning content and has an ability to encourage practicing. The learners should take supplementary lessons if their scores are below a certain level or should take advanced courses if their scores are more than a certain score in accordance with the evaluation of their understanding of the learning activities and learning results. In addition, the instructor sends e-mails, messages and telephones to facilitate the self-directed study activities of the learners.

CONCLUSION

To improve NCS Core Competence we both need off-line education and on-line learning system. The instructors and learners should have the sense of unity by participating together in the on-line and off-line learning activities.

In general, at colleges the students can take 3 to 5 NCS courses about basic job skills. Besides, they can learn through the on-line learning system the lacking NCS basic job skill units. They can supplement and improve their abilities by selecting necessary units out of 10 core units through the on-line system.

This study presents an instructional design model on on-line learning system based on the existing teaching-learning design. This design model utilizes the merits of both on-line and offline education and deals with case study activities, discussion methods and entrance examination process issues to achieve the improvement of each learner's NCS core competency.

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1 The Source of [Figure 1]: The learning contents and pictures inserted in [Figure 1] were extracted from Reference [8].

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