

The improvement of the education courses on radiation protection and radioisotope handling

HanSuk KO ^{a*}, Woong Ki KIM ^a

^a National Education Team, Korea Atomic Energy Research Institute, Daejeon, 305-353, Korea

* Corresponding author: hsko@kaeri.re.kr

1. Introduction

The Korea Atomic Energy Research Institute (KAERI) has provided a unique education and training program to nuclear power personnel and radioisotope use personnel from its opening in 1959. The nuclear power and R&D personnel for an NPP and the medical staffs in a hospital for RI use are top priority of KAERI's education policy. KAERI launched the Radioisotope (RI) medical use course in 1961 and the radioisotope agricultural use course in 1962. The supervisor course for radiation handling was started in 1963 and the basic course of radioisotope handling (current radioisotope handling course) was started in 1964. After the establishment of the Nuclear Training and Education Center (NTC) of KAERI in 1967, KAERI-NTC greatly contributed to training nuclear and radiation experts at the beginning of nuclear history. About 48,000 nuclear personnel and 10,000 radioisotope personnel have participated in the KAERI-NTC's education and training programs.

For the needs of personnel in radioisotope and radiation handling, KAERI-NTC has operated a classroom based full-time course for 4 weeks for applicants of a general license and 6 weeks for applicants of supervisor license. These courses educated almost 3,908 trainees for general radioisotope handling and 1,856 trainees for supervisors of radiation handling. Since the Korean Association for Radiation Application (KARA) was established in 1985 and the Korea Academy of Nuclear Safety (KANS) was established in 2002, KARA and KANS have operated with a non-classroom based correspondence course. According to this role separation in training radioisotope handling personnel, KAERI-NTC tried to improve the classroom based courses. [1][2] The number of applicants of general radioisotope handling in recent years is increasing around 3,000 - 4,000 in a year. The real participants in an general license test are 2,105 to 2,841 in 2013 and 2014. The ratio of successful applicants in general isotope handling are just the 23% in 2013 and 4.2% in 2014. [3]

Addressing this low ratio of successful applicants, several proactive measures in KAERI-NTC were considered to enhance these courses for general users and supervisors. The purpose of this paper is to provide

what we did to improve current courses and to share what should we do for the next step.

2. Methods and Results

2.1 Survey results and FGI Analysis

According to survey results from previous courses, the participation purpose of general radioisotope handling course (multi-choice allowed) are to have career on radioisotope use(58%), acquisition general license (47%) and learning the professional knowledge(32%). [4] While the survey can be more effective for determining the prevalence of any given attitude or experience, the focus group interviews has real strength in exploring that people have to say and in providing insights into the sources of complex behaviors.[5] It is recommended the it is the leading ways of combining qualitative and quantitative methods such as combination survey as the primary method and Focus Group Interviews(FGI) as a follow-up method uses. After these implementation of survey and FGI, the results are as follows.

Firstly, it was requested that some lectures should directly be related to general license exam. While there are still strong support of importance of the general knowledge and field experiences in the course, more lectures directly related examination were finally decided after the survey analysis, expert interviews and discussion. Secondly, it was suggested that more self-study time among trainees could help the trainees share their learning ways, knowledge and skill with other participants. Current CBT (Classroom Based Training) are still relatively effective for learning in short time but it also has disadvantage for trainees with different knowledge level to keep their power of attention to lectures. Thirdly, it was suggested that the special lecture time should be provided information for learning ways and experience from the latest licensee.

2.2 The suggested measures

From previous surveys, FGI analysis and discussion, we firstly introduced the 12 times trial exam test which consists of 4 parts; nuclear theory, radiation protection, RI safety law and radiation handling.

Secondly, the group study is organized with the results of trainee's pre-level test. Each group consists of different trainees with high score to low score. This combination could give the group members the boost-up

chance of learning who might have difficulties to catch up with the pace of lectures in course.

Finally, the successful licensee's seminar give the trainee the best practices for successful applicants. Three licensee came from the hospital and the industry and gave short lectures on learning method, effective scheduling of learning and exam.

2.3 Results of enhancement measures for supervisor and general users

The survey for the trainees was performed for the assessment of the introduction of the suggested enhancement measures. Response was highly positive (more than 80%) on the trial of pre-level and post-level test, group study and best practice seminar from the successful licensees. Especially, the test results showed the big improvements on learning achievement between the pre-level result and post-level one. Figure 1 shows the result of survey on the supervisor course for radiation handling after the introduction of improved measures.

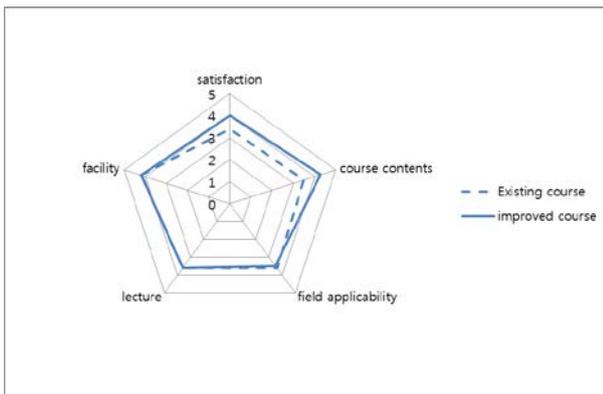


Figure 1. The survey results after the introduction of improved measures on supervisors course

From the survey analysis for general users, satisfaction score of course was 82%. Many trainees responded positively for the lecture on exam preparation way. Figure 2 shows the result of survey on the general user course for radioisotope handling course after the introduction of improved measures.

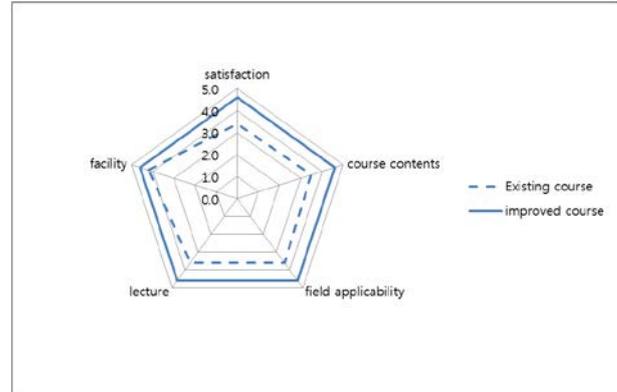


Figure 2 The survey results after the introduction of improved measures on general user course

3. Further discussion and conclusions

For the further development of these courses, our measures were classified the measures in the Implementation stage of the ADDIE model [6]. In addition to this Implementation stage, it is recommended that these actions should be applied to the other stages of ADDIE such as Analysis, Design, Development and Evaluation.

While there are many relevant education organization such as RI association and KANS, RI educator regular meeting among them should be suggested. This meeting will be helpful to share the teaching information and to discuss the effective education of RI personnel each other.

REFERENCES

- [1] KAERI, "Development/Implementation of Education and Training program for nuclear Human Resource", KAERI/RR-3786/2014(Korean)
- [2] KINS, "A study of new regulatory guidance of licensing for using radioisotope and radiation generator", KINS/GR-298, 2005(Korean)
- [3] KINS, "Development of item pool for a general license for the radioisotope handling", KINS/RR-1292, 2014. 12(Korean)
- [4] JS Nam, WK KIM, HS Hwang(KAERI), "Analysis of educational satisfaction on the course for recognition of practical experience with a license for the supervisor of radiation handling", Journal of radiation protection, Vol. 39 No. 4, Dec. 2014.(Korean)
- [5] Morgan David L, "Focus Groups", Annual Review of Sociology Vol. 22, pp. 129-152. 1996
- [6] IAEA, Experience in the use of systematic approach to training (SAT) for nuclear power plant personnel, IAEATECDOC-1057, IAEA, Vienna (1998)