

Occupational Health and Safety Lesson Plan Impact on Student Access in Vocational Education *

Aydın Çağlıyan^a

Abstract: Occurring occupational accidents show that with the developing technology, there is a greater need for employees and technical personnel who implement occupational health and safety in Turkey and all over the world. As a result of the need for technical staff, the importance of vocational education has come to the fore. As a result of this demand, there has been an increase in the number of vocational teachers and students receiving vocational education. Parallel to this, occupational accidents in vocational training have also increased. There is a need to determine what measures are taken for occupational health and safety of students and teachers receiving vocational training. In the study, it was revealed that the knowledge, comprehension, application and total achievement levels of the students before and after the occupational health and safety training given in vocational high schools were investigated. The research is empirical in quantitative dimension. For this reason, universe and sample determination was not made. The study group of the research was formed as an experimental group of 1 class, which was randomly assigned among the 9th grade students who received vocational education at Selçuklu Vocational and Technical Anatolian High School in the Selçuklu district of Konya province, affiliated to the Ministry of National Education, in the 2020-2021 academic year. The achievement test was prepared by the researcher and consists of 20 questions. While the test was being prepared, the achievements were written according to Bloom's taxonomy and placed in the specification table. Expert opinion was sought for content validity. The KR-20 reliability of the test was calculated as 0.85. In the analysis of the data, dependent groups t-test was used for distributions in the comparison of the means within the study group according to the pre-test and post-test. As a result of the study, it has been observed that there is a significant difference in favor of the posttest between the knowledge, comprehension and application levels of the Selçuklu Vocational and Technical Anatolian High School 9th Grade Professional Development Workshop course Occupational Health and Safety unit and the total pretest and posttest mean scores of the students. It is recommended that the daily lesson plan of the Occupational Health and Safety unit can increase the students' knowledge, comprehension and application level.

Keywords: Vocational Education, Occupational Health, Occupational Safety, Daily Plan.

1. Introduction

The mental and physical health of the employees is also one of the main elements of professional life, which concerns all segments of the employee's work safety. Figures on occupational health and safety provide important information in terms of basic human rights, business life and the development status of countries (Alper, 2012). Official records of the social security institution and the ministry of labor reveal that the necessary sensitivity is not shown to our country's employees in working life in terms of occupational health and safety, and there are deficiencies in laws, regulations and practices (Guzel, Okur & Caniklioğlu, 2012). As employers and public employers, giants are pushing this issue into the background due to the impact of economic concerns. Our country ranks first among European countries in terms of occupational accidents that employees are exposed to. It is also at the top of the world rankings. Chamber of Mechanical Engineers, which is under the umbrella of the Union of Chambers of Turkish Engineers and Architects (TMMOB) and has important contributions and responsibilities in occupational safety, the unwillingness of employers to implement the necessary measures on Occupational Health and Safety (OHS), the inability to adequately control the working environments by the giants, the rules The fact that there are few administrative-penal sanctions against workplaces that do not comply indicates that the exposure of employees to occupational accidents is the most important problem in occupational safety (TMMOB, 2018) .

These occupational accidents, which are exposed, show that there is a greater need for employees and technical personnel who implement occupational health and safety in Turkey and all over the world with the developing technology (Çiçek and Öçal, 2016). As a result of the need for technical staff, the importance of vocational education has come to the

* This study is a part of the author's master thesis.

^a Teacher, Ministry of National Education, Konya, Turkey, cagliyanaydin@hotmail.com

fore. As a natural result of this demand, there has been an increase in the number of vocational teachers and students receiving vocational education. In parallel with this, occupational accidents in vocational training have also increased. The need to determine the measures to be taken in accordance with the occupational health and safety of the students who receive vocational training and the teachers who are with them arose. The structure of vocational schools in our country is included in the Vocational Education Law dated 05.06.1986 and numbered 3308. Many occupational accidents occur due to practice or negligence during workshop and laboratory studies in vocational schools (Çetinkaya and Ulusoy, 2019). In this respect, it can be stated that occupational safety and the training given on this subject have an important place in vocational schools, and training for occupational safety has gained importance in recent years.

1.1. Historical Development of Occupational Health and Safety in the World

The relationship between work and health (industrial health-worker health-occupational hygiene) began to be emphasized for the first time in Greek and Roman civilizations. However, in-depth studies on this subject, Paracelsus (1493-1541, one of the first physicians to deal with the health issues of workers), Gregorius Agricola-George Bauer (Saxon physician, wrote his "De Re Metalica", which contains classical information on the problems of workers working in European mines, in 1526) and Bernardino Ramazzini. The great Italian clinician Bernardino Ramazzini (1633-1714) is considered the father of industrial health. Ramazzini has been busy with occupational diseases for a long time in his work titled "De Morbis Artificum Diatriba" published in 1713. Industrial health problems later attracted a great deal of attention, especially within the industrialization movements. Although occupational medicine was born in Italy, it spent its growth and development phase in England, the cradle of the Industrial Revolution (1760-1830). Sir Percivale Pott described chimney sweeps' scrotal (testicular) cancer in 1776. In England, Charles Turner Tachar (1795-1852) wrote a comprehensive book on occupational diseases. In the 19th century, governmental handling of industrial health issues coincided with the times when Industrial Revolution movements began to accelerate in England. At the beginning of the century (1802), the "Law on the Protection of Health and Morals" and the "Factories Law" (1833) to follow it came into force. In this last law, "Occupational Safety Inspectorship" was foreseen. In the same period, it is seen that the state started to protect the working people in other European countries: The "Emperor's Decree" published in France in 1810 and the "Labor Legislation" published in the same country in 1841 are the first products of these efforts. In the 20th century, on the other hand, when the industrialization movements were accelerated in the United States of America. At the beginning of the century, a great work can be seen. The first comprehensive American book, The Occupational Diseases, was published in 1914 by Gillmann Thomson, professor of internal medicine at Cornell University.

The International Labor Organization (ILO) was established in Geneva in 1919. Many conventions on occupational health and safety have been issued by the International Labor Organization (ILO) since 1919. An important part of them was approved and put into effect by the Republic of Turkey. In the 20th century, occupational health and safety began to take place in the foreground, especially in developed countries, with the developments in the industry. Indeed, modern regulations regarding occupational health and safety have been made in countries such as the United States of America, England, Canada, Australia, Japan and Germany. Occupational health and safety phenomenon has started to be dealt with predominantly in the European Union since the 1980s. In particular, the Occupational Health and Safety Directive 89/391/EEC issued in 1989 was accepted as a framework directive in the field of occupational health and safety, and then many individual directives were issued based on this framework directive. At the point reached today, occupational health and safety is considered as a branch of science. Research and development studies are carried out continuously and new legal regulations are made regarding the newly emerging risks in the industry and working life.

In our country, many laws, regulations, etc. related to the field in the last century. Although there is legislation, the occupational health and safety structuring in accordance with today's conditions is made according to the Labor Law No. 4857, which came into force in 2003, and the Occupational Health and Safety Law No. 6331, which entered into force in 2012. With the Occupational Health and Safety Law No. 6331, the concept of occupational health and safety covering all employees have been adopted instead of the occupational health approach covering only physically working people. There was a similar approach in the world, the change in the way of working in the society, which started with the Industrial Revolution in England in the 19th century, the process that transformed from agricultural work to industrial work, and then the protection, monitoring and necessary precautions not only of the worker but also of the worker's environment and working environment continued with the adoption of the occupational health approach, which adopts the 2 As the importance given to protecting health increases, health problems in the world are changing, easily preventable injuries and deaths are decreasing. It is expected that more complex health problems will decrease as health protection approaches increase. In addition, today, the approach of health promotion is being adopted more and more as a concept beyond protecting health.

1.2. Historical Development of Occupational Health and Safety in Turkey

The movements to protect working people in Turkey started with the "Dilaver Pasha Regulations" published in 1865 and the "Maadin Regulations" (1869) that followed it. The handling of the industrial health issue with all its aspects took place in the Republican period. In the "Dilaver Pasha Regulations" issued in 1865, it is seen that various issues related to the rest and vacation times of the workers in the Ereğli and Zonguldak coal basins, their accommodation places, working hours and their health were discussed. The "Maadin Regulation", which was enacted in 1869, is a legislation that regulates various provisions regarding the safety of workers in all mines. The Maadin Regulation abolished the compulsory work in force at that time in the coal mining business line, and thus, it was desired to emphasize the human aspects of work as well as the economic aspects. Since the establishment of the Turkish Grand National Assembly on April 23, 1920, the issue of occupational health and safety has also been brought to the agenda and various legal regulations have begun to be made. "Ereğli Havza-i Fahmiyesi" Mining Workers' Law (Law No. 151 on the Law of Ereğli Coal Basin Mine Workers), equipped with extremely modern provisions for its time, was established on 10 September 1921 in Sakarya, at a time when the National Struggle was most intense. It was removed during the war. Later, in the Labor Law No. 3008 enacted on 8 June 1936, basic occupational health and safety provisions were included. It is not possible to say that occupational health and safety was at the forefront during the cold war years when industrialization began to be experienced more intensely in the period after the Second World War. The discipline, which was included with modern provisions for the first time in the Labor Law No. 931 enacted in 1967, took place with the same provisions in the Labor Law No. In order to catch up with the industrial revolution experienced in the West for 150-200 years, in the 1970s, 80s and 90s, when industrialization was continued, the Labor Law No. was able to answer. However, with the end of the 20th century and the beginning of the 21st century, the fact that technology, all industrial conditions, industrial relations and labor legislation is advancing and changing at a dizzying pace has emerged. At the European Union's summit in December-1999, with the recognition of Turkey's candidacy status, the Labor Law No. 4857 was enacted in 2003. The provisions of this Law related to occupational health and safety were transferred from the Labor Law No. 1475, with the exception of a few articles. However, the regulations that should be issued according to the Labor Law No. 4857 were harmonized according to the European Union's framework directive No. 89/391/EEC and other individual directives and were published consecutively in 2003 and 2004. Occupational Health and Safety Law No. 6331 was enacted on June 29, 2012 and put into effect as of January 1, 2013, and subsequently, the legislation on occupational health and safety in our country has been equipped with modern provisions. However, more distance needs to be covered in practice.

1.3. Occupational Health and Safety in Vocational Education

As a young people with occupational accidents, it is simpler to the public (Karadeniz, 2012). This occupational health and Safety is highlighted for training for students from Occupational Health and Safety (OSH) from user exams from the field of vocational education. Planning in education can be expressed as how to put it playable in some way after training. With more obvious notation, it can be planned to plan.

In the occupational health and safety unit, it should be known what order to follow while preparing a one-day lesson plan. While preparing the daily plan, the target behaviors should be determined gradually. Then, in the introduction part of the daily plan, activities for attracting attention, motivation, review, transition to the lesson should be written, appropriate strategy, method, technique should be used in the development part, the final summary, re-motivation and closing should be included in the conclusion section; The final evaluation section should be edited.

Test situations are all about measurement and evaluation. Questions appropriate to the behavior of the targets set for the Occupational Health and Safety unit should be written. These questions should be in accordance with the measurement-evaluation principles. To achieve this, the specification table must first be prepared.

In the study, the answer of the "is there a significant difference between the occupational health and safety pre-test and post-test scores of The Vocational and Technical Anatolian High School students?" question were searched.

1.4. Purpose of the research

This research started with the development of the daily lesson plan of the Occupational Health and Safety unit of the 9th grade Professional Development Workshop of vocational and technical Anatolian high schools, in accordance with the curriculum design whose principals were summarized above, and the effect of the program in a selected school was investigated experimentally. Researching the knowledge, comprehension, application and total achievement levels of the students before and after the occupational health and safety training given in vocational high schools was considered important and the research topic was made. In this context, the hypotheses of the research are as follows;

1.4.1. Hypotheses

1. There is a significant difference between students' knowledge level attainment on occupational health and safety before and after OHS training.
2. There is a significant difference between the students' understanding of occupational health and safety before and after the OHS training.
3. There is a significant difference between the students' level of practice in occupational health and safety before and after OHS training.
4. There is a significant difference between the total achievements of students in occupational health and safety before and after OHS training.

1.5. Importance of Research

Occupational accidents in vocational high schools mostly occur during the workshops of the students. In order to prevent these accidents and to enable students to act consciously in real life, OHS trainings have been included in the training programs by the Ministry of National Education. Machinery and hand tools used especially for some departments; poses great risks to the health of students and teachers. OHS trainings; It is given with the aim of making students aware of the dangers and risks arising from these machines and tools and avoiding these risks. Again, with these trainings, it is aimed that the students comply with the safety rules and avoid unnecessary risks and make safe working a behavior. Considering that our country unfortunately ranks first among the European Union members in terms of occupational accidents and worker deaths (TMMOB, 2018) and the high accident rate of vocational high school graduate young workers who aim to train qualified personnel for the country's industry, it should be emphasized that OHS trainings are important (Cerev and Yildirim, 2018). The contents of the organized OHS trainings; It is prepared according to the subjects specified in the regulation on the procedures and principles of the OHS training of the employees (Official Gazette, 2009).

Selcuklu Vocational and Technical Anatolian High School is one of the well-established vocational high schools in Konya, which has been continuing its education and training since 1991. Within the high school, there are Metal, Electric and Electronic, Machinery, Chemistry, Informatics and Furniture Decoration, Engine fields. The high school, which has approximately 1500 students, graduates 300-350 students every year. This means that every year, close to these numbers of young workers participate in the working life. Considering that the accident rate among young workers is high (Öztürk, 2020), the increase in the level of knowledge of OHS training given to high school students, the prevention of accidents in this regard or the result of no possible increase are important for the review of the trainings given and also the importance of the research.

2. Method

In this section, the research model, research group, data collection tools and techniques, data collection and data analysis are emphasized.

2.1. Research Model

In the study, pre-test without control group, and post-test single-group experimental design, which is one of the quantitative research methods, were used. In this design, maturation, time, measurement error, tool and center orientation errors that affect the result are not controlled (Sönmez and Alacapınar, 2019). The most important point to note in this design is that the experimental procedures are carried out in an environment that complies with the instructions and the determined features. This was done by the researcher.

The research model can be given as in below;

G	T1	D	T1
---	----	---	----

G: The researched group.

T1: Pre-test. Findings obtained using the measurement tool.

D: Experimental variable, its effectiveness, independent variables introduced.

T1: Final test. Findings obtained using the measurement tool.

OHS training was applied to a randomly selected group as an experimental procedure. These trainings were given by vocational teachers who have OHS specialization certificate. A pre-test was applied to this experimental group before starting the training. At the end of the 6-hour training, the post-test was applied. The achievement test questions in this study were prepared by the researcher. It was investigated whether there was a significant difference by looking at the difference between the pre-test and post-test scores of the students in the experimental group.

In the application of the design, the pre-test was given to a single group before the experiment began. The lesson was taught according to the prepared daily plan. After the experiment was finished, the same test was given as the post-test. The post-test was given immediately at the end of the training, without extending the time.

2.2. Study Group of the Research

The research is empirical in quantitative dimension. For this reason, universe and sample determination was not made. The study group of the research was formed as an experimental group, which was randomly assigned among the 9th grade students who received vocational education at Selçuklu Vocational and Technical Anatolian High School in the Selçuklu district of Konya province, affiliated to the Ministry of National Education, in the 2020-2021 academic years. The research was carried out with 30 students in the experimental group. The achievement test in this study was prepared by the researcher.

Experimental group: It is the group of 9th grade students to whom occupational health and safety education will be applied. Occupational health and safety training was given to this group in accordance with the predetermined content, supported by visual materials.

2.3. Data Collection Tools and/or Techniques

In order to determine the achievements of 9th grade students at Selçuklu Vocational and Technical Anatolian High School before and after receiving OHS training, a test study was conducted. It was determined what the students' knowledge about OHS was. The test to be used consists of 20 questions prepared by the researcher and was prepared as multiple choices. According to Bloom's taxonomy, the level of questions in the test was prepared as 10 questions at knowledge level, 5 questions at comprehension level, and 5 questions at application level. The specification table is also prepared at the unit level. During test development, validity study, reliability study and KR-20 reliability coefficient were calculated using SPSS programs.

The average item difficulty (p_j) of the test was calculated as 0.732, consisting of relatively easy questions compared to moderate difficulty questions, and the average item discrimination index (r_{jx}) was calculated as 0.499. Looking at the r_{jx} value, it can be said that the questions are moderately discriminating. The KR-20 reliability value of the measurement tool was calculated as 0.852. The fact that this value is greater than 0.80, it can be said that the scale is highly reliable. The Occupational Health and Safety unit of the Professional Development Workshop course, which consists of 20 items, is seen as a valid and reliable tool with the values obtained from the 9th grade student achievement test.

2.4. Data Collection

The time of the experimental study was planned as follows. In the first week of education, the experimental process was started to be applied to a class chosen by chance among the 9th graders who came to the school on the first day of practice courses, that is, workshop or laboratory courses. Of course, necessary permissions were obtained from the relevant school administration beforehand. As the first application of the experimental process, a pre-test was applied to the experimental group. Afterwards, 6 hours of occupational health and safety training was given in accordance with the predetermined content. A post-test was administered at the end of the training. The data obtained from the pre-test and post-test were used.

2.5. Analysis of Data

Statistical analyzes of test results were performed. Shapiro-Wilk test was used to determine whether the values showed normal distribution or not. It was observed that normality was achieved. The .05 value, which is valid for social sciences, was taken as the level of significance.

The preliminary and final average scores of each student were calculated based on the data obtained. Using these mean scores, the pre- and post-test scores of the dependent groups were compared with the "t" test, whether the difference between the mean was significant or not. In addition, descriptive statistics such as percentage and frequency were used to reveal the demographic information of the students.

Table 1. Distribution of Students by Classes, Gender and Percentages

Classes	n	girl		boy	
		n	%	n	%
9E	30	3	%10	27	%90
Total	30	3	10	27	90

3. Findings

The collected data were analyzed with the "dependent sample t test". In this section, the findings related to the sub-problems are emphasized. As a result of the analyses made using the technique specified in the third section on the sub-problems, the findings were presented according to the hypotheses.

3.1. Comparison of Pretest-Posttest Mean Scores of the Experimental Group

The t-test results of the related samples in which the achievement test mean scores of the experimental group students before and after the Layered Curriculum were compared are given in Table 3.1.

Table 2. t-Test Results of Pre-test-Post-test (Achievement) Scores of Students by Group

Level	Measurement	n	\bar{X}	S	sd	t	p
Information	pretest	30	3,88	1,59	29	-11,136	0,000*
	posttest	30	7,73	1,20			
Clutch	pretest	30	1,83	0,98	29	-13,228	0,000*
	posttest	30	4,13	0,73			
Application	pretest	30	1,73	0,82	29	-14,062	0,000*
	posttest	30	4,23	0,62			
Total	pretest	30	7,5	1,92	29	-20,869	0,000*
	posttest	30	16,03	1,58			

$p \leq 0,05$

When Table 3.1 is examined, it is seen that there is a significant difference in favor of the posttest between the knowledge, comprehension and application levels of the Selcuklu Vocational and Technical Anatolian High School 9th Grade Professional Development Workshop course Occupational Health and Safety unit and the total pretest and posttest mean scores observed among the experimental group students ($t_{(29)} = -20,869$; $p < 0.05$).

3.2. Knowledge Level Achievements on Occupational Health And Safety

Related samples t-test was conducted to determine whether there is a significant difference between the students' knowledge level achievements on occupational health and safety before and after OHS training. Between the test scores taken before the OHS training ($\bar{X}_{pretest} = 3.88$) and the test scores obtained after the OHS training ($\bar{X}_{posttest} = 7.73$), the t value was 29 degrees of freedom -11,136 [$t_{(29)} = -11,136$; $p < 0.05$]. Considering the P value, a significant difference was observed at the 0.05 significance level.

3.3. Comprehension Level Achievements On Occupational Health And Safety

The related samples t-test was conducted to determine whether there was a significant difference between the students' understanding of occupational health and safety before and after the OHS training. Between the test scores obtained

before the OHS training ($\bar{X}_{\text{pretest}} = 1.83$) and the test scores obtained after the OHS training ($\bar{X}_{\text{posttest}} = 4.13$), the t value was -13,228 at 29 degrees of freedom [$t_{(29)} = -13,228$; $p < 0.05$]. Considering the P value, a significant difference was observed at the 0.05 significance level.

3.4. Practice Level Achievements on Occupational Health And Safety

Related samples t-test was conducted to determine whether there is a significant difference between the students' practice level achievements on occupational health and safety before and after OHS training. Between the test scores taken before the OHS training ($\bar{X}_{\text{pretest}} = 1.73$) and the test scores obtained after the OHS training ($\bar{X}_{\text{posttest}} = 4.23$), the t value was 29 degrees of freedom -14.062 [$t_{(29)} = -14.062$, $p = 0.00 < 0.05$]. Considering the P value, a significant difference was observed at the 0.05 significance level.

3.5. Total Level Of Access To Occupational Health And Safety

Related samples t-test was conducted to determine whether there is a significant difference between the students' total achievement levels on occupational health and safety before and after OHS training. Between the test scores taken before the OHS training ($\bar{X}_{\text{pretest}} = 7.5$) and the test scores obtained after the OHS training ($\bar{X}_{\text{posttest}} = 16.03$), the t value is 29 degrees of freedom -20.869 [$t_{(29)} = -20.869$, $p = 0.00 < 0.05$]. Considering the P value, a significant difference was observed at the 0.05 significance level.

4. Results

In this section, conclusions and recommendations based on the findings obtained from the research are given.

4.1. Knowledge level results on occupational health and safety

The prepared daily plan was used in the teaching of the Occupational Health and Safety unit of the Professional Development Workshop course. The SPSS calculations of the pretest-posttest knowledge level dependent sample t-test used to test whether the unit's occupational health and safety knowledge level objectives have been gained are given in Table 3-1. 10 questions of the prepared test are about the level of knowledge.

By taking OHS training, we can increase the average of the test that measures the level of occupational health and safety knowledge. These OHS trainings increase student success by an average of 3.90 net in knowledge level questions consisting of 10 questions out of a 20-question test before and after. Looking at this result, it can be said that; If the lesson is taught with the prepared daily lesson plan, students' occupational health and safety knowledge level can increase significantly.

4.2. Comprehension level results on occupational health and safety.

The prepared daily plan was used in the teaching of the Occupational Health and Safety unit of the Professional Development Workshop course. The SPSS calculations of the pre-test-post-test comprehension level dependent sample t-test used to test whether the unit's occupational health and safety concept level goals have been gained or not are given in Table 3-1. 5 questions of the prepared test are related to the level of comprehension.

By taking OHS training, we can increase the average of the test that measures the level of understanding of occupational health and safety. These OHS trainings increase student success by an average of 2.30 net in comprehension level questions consisting of 5 questions out of the 20-question test before and after. Looking at this result, it can be said that; If the lesson is taught with the prepared daily lesson plan, the level of understanding of occupational health and safety of the students can increase significantly.

4.3. Practice level results on occupational health and safety.

The prepared daily plan was used in the teaching of the Occupational Health and Safety unit of the Professional Development Workshop course. The SPSS calculations of the pretest-posttest application level dependent sample t-test used to test whether the unit has achieved the occupational health and safety application step goals are given in Table 3-1. 5 questions of the prepared test are related to the application level.

By taking OHS training, we can increase the average of the test that measures the level of occupational health and safety practice. These OHS trainings increase student success by an average of 2.50 net in practice level questions consisting of 5 questions out of the 20-question test before and after. Looking at this result, it can be said that; If the lesson is taught with the prepared daily lesson plan, the students' achievement of occupational health and safety practice level can increase significantly.

4.4. Results of overall achievement level on occupational health and safety.

The prepared daily plan was used in the teaching of the Occupational Health and Safety unit of the Professional Development Workshop course. The pretest-posttest total achievement level dependent sample t-test SPSS calculations used to test whether the unit has attained the occupational health and safety total attainment level goals are given in Table 3-1. The prepared test consists of 20 total questions.

By taking OHS training, we can increase the average of the test that measures the total level of access to occupational health and safety. These OHS trainings increase student achievement by an average of 8.53 net in total achievement level of 20-question test before and after. Looking at this result, it can be said that; If the lesson is taught with the prepared daily lesson plan, the total achievement level of students in occupational health and safety can increase significantly.

5. Discussion

In this section, the conclusions reached based on the findings obtained from the research are discussed and recommendations are given.

5.1. Discussing the Results of the First Hypothesis

The first hypothesis of the research is "There is a significant difference between the students' knowledge level attainment on occupational health and safety before and after OHS training." is in the form. Teaching the lesson in accordance with the prepared daily lesson plan increased the knowledge level of the students on occupational health and safety before and after the OHS training. The data confirm the hypothesis and it was accepted. This result can be interpreted as follows: The prepared daily lesson plan is effective in gaining knowledge-level behaviors to the student. Because of the teachers clearly stated that what and how to tell in the daily plan. So much so that even a person who is teaching for the first time according to this plan can clearly see this. As stated in the plan, before starting the lesson, the student's prior knowledge, interest and motivation were determined, and then the teaching was organized considering these characteristics. In Bloom's research; cognitive entry behaviors accounted for .50 of the variance observed in achievement, affective entry characteristics .25; He supports this result by saying that if both are run together, it can explain .65 of them (Bloom, 1976:169).

In the programs organized, while the educational experiences that bring the behaviors in the knowledge level are listed, the attention of the students to the subject was drawn first, and student participation was ensured for this purpose. Preliminary organizer was presented and hints were given by telling which behaviors to be acquired during the lesson. By applying the lecture method, which is the most appropriate method in gaining the behaviors at the knowledge level, the concepts, facts and principles were first presented by the teacher, from easy to difficult, according to their prerequisites, by giving hints on tools such as case studies, warning-warning signs, and re-explaining the incomprehensible places.

Afterwards, predetermined questions were asked to the students, at least 5 students were given the right to answer, and those who answered correctly were given reinforcement. Wrong and incomplete answers were not penalized, and corrections were made by giving feedback. At the end of the activities, student participation was ensured at the highest level by using case study techniques. In a study on these activities in the daily lesson plan, Bloom concluded that there is a significant relationship between clues, feedback-corrections, student perseverance, reinforcement and student success (Bloom, 1976:125).

For the result to be meaningful, behaviors in accordance with teaching principles such as cognitive entry behaviors of the student, taking affective entry characteristics into consideration before the lesson starts, hinting, feedback-correction, reinforcement, including student perseverance, and supporting teaching-methods and techniques, from concrete to abstract, with examples may have been effective.

5.2. Discussing the Results of the Second Hypothesis

Teaching the lesson in accordance with the prepared daily lesson plan increased the students' understanding of occupational health and safety before and after the OHS training. The data confirm the hypothesis and it was accepted. The prepared daily lesson plan is effective in gaining the students comprehension level behaviors. Gaining behaviors to the level of comprehension is directly proportional to the active participation of the student in the lesson. Therefore, active participation of students in educational life should be ensured. Student interaction in the classroom is a necessary but not sufficient condition for participation. At the same time, the student should be directed to in-class activities with active attention and care. Only then can learning be achieved through experience. For this purpose, in the introductory part of the course and in order to draw attention when necessary, interesting events and memories were explained and

active participation of the student was ensured. Questions about goals and behaviors appropriate for the level of the student were presented with reasons such as why, why, how, and what are the results in the educational situation. In addition, these questions and the right to speak were distributed fairly in the class in the discussions. The teacher did not respond to the wrong and incomplete answers, and he had them find the class using clues. This situation is also supported by Sönmez and Alacapinar's (2019) view that "feedback, correction, reinforcement processes should be used in the training situation when appropriate".

The most effective method at the cognitive level of comprehension is guided discussion (Sonmez, 1985:219). For this purpose, by applying the teacher-guided discussion method in the daily lesson plan, asking open-ended questions and directing them to the main and auxiliary points, he enabled the students to reveal the comprehension level behaviors. As it can be understood from the findings section, the students answered different questions measuring the reasons, whys, and predicting possible outcomes, and their comprehension level masculine increased significantly. Students presented their own opinions, listened to other opinions and then brought criticism. Finally, a common decision was reached as a class for the correct solution of the problem. All these activities for student participation are effective in gaining comprehension level behaviors.

For this purpose, educational situations were arranged in a way to ensure the participation of the student in the daily plan. Ensuring student participation, teaching methods and techniques, appropriate behavior of the teacher, and the use of hints may have contributed to the meaningful result.

5.3. Discussing the Results on the Third Hypothesis

Teaching the lesson in accordance with the prepared daily lesson plan increased the students' level of practice in occupational health and safety before and after the OHS training (Ceylan, 2012). The data confirm the hypothesis and it was accepted. The prepared daily lesson plan has been effective in gaining the students the practice level behaviors. Case study method is one of the methods that are useful in gaining the behaviors at the application level effectively. Case studies have been identified and applied while imparting practice-level behaviors. These can be seen on the daily schedule. For this purpose, a ready-made case study text was obtained. If this text was read in class and it was about the text, how would you have acted? Why is that? Why? questions were asked. In this way, it may have been effective for the student to build a bridge between real lives. The case study text and the application of the method gave effective results in the application level of the students.

5.4. Discussing the Results on the Fourth Hypothesis

The obtained data confirm the hypothesis and fourth hypothesis was accepted. Total attainment consists of knowledge level, comprehension level and application level. The lesson is taught in a phased plan. As it can be understood from the statistical operations, that the result is significant and that the lesson is taught in accordance with the lesson plan also increases the total level of achievement. Topgül and Çağatay (2017) emphasized that the lesson plan is important in occupational safety education.

5.5. Suggestions

1. The daily lesson plan of the Occupational Health and Safety unit can increase the students' knowledge, comprehension and application level.
2. The study can also be done using a control group.
3. Planned activities in accordance with this lesson plan should be included in schools.
4. Teachers and administrators should be informed about how a modern education program should be ensured, and they can be continuously trained on OHS training.

6. References

- Alper, Y. (2012). Occupational health and safety practices in some countries and their comparison with the practice in Turkey. *Journal of Social Politics Conferences*, (37-38), 83-101.
- Blease, C. & Kirsch, I. (2016). The placebo effect and psychotherapy: Implications for theory, research, and practice. *Psychology of Consciousness: Theory, Research, and Practice*, 3(2), 105-107. <http://dx.doi.org/10.1037/cns0000094>

- Bloom, B. (1976), Human qualities and learning at school, (Translated Durmus Ali Ozcelik), Ankara: Milli Eğitim Bakanlığı Publishes.
- Cerev, G. & Yıldırım, S. (2018). An investigation on the effects of personal characteristics of employees on work accidents and occupational diseases. *Firat University International Journal of Economics and Administrative Sciences*, 2(1), 53–72. <https://dergipark.org.tr/tr/pub/fuuiibfdergi/issue/39056/458156>
- Ceylan, H. (2012). *Türkiye'deki iş sağlığı ve güvenliği eğitimi sorunlar ve çözüm önerileri*. *Ejovoc* (Electronic Journal of Vocational Colleges), 2(2), 94-104.
- Çetinkaya, A. İ. & Ulusoy, I. (2019). Occupational health and safety in workshop applications in vocational and technical high schools. *OHS ACADEMY*, 2(3), 77–85.
- Çiçek, Ö. & Öçal, M. (2016). Historical Development of Occupational Health and Safety in the World and in Turkey. *Hak İş International Journal of Labor and Society*, 5(11), 106-129.
- Guzel, A., Okur, A. R. & Caniklioğlu, N. (2012). *Sosyal Güvenlik Hukuku (Social security law)*. Istanbul: Beta Publishing.
- Hayes, B. E., Perander, J., Smecko, T. & Trask, J. (1998). Measuring Perceptions of Workplace Safety: Development and Validation of the Work Safety Scale. *Journal of Safety Research*, 29(3), 145–161. [https://doi.org/10.1016/S0022-4375\(98\)00011-5](https://doi.org/10.1016/S0022-4375(98)00011-5)
- Karadeniz, O. (2012). Occupational Accidents and Occupational Diseases and Inadequacy of Social Protection in the World and in Turkey. *Work and Society*, 34(3), 15-75.
- Kilkis, I. & Demir, S. (2012). A review on the employer's obligation to provide occupational health and safety training. *Journal of Labor Relations*, 3(1), 23–47.
- Mora, Z., Suharyanto, A. & Yahya, M. (2020). Effect of Work Safety and Work Healthy Towards Employee's Productivity in PT. Sisirau Aceh Tamiang. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 3(2), 753–760. <https://doi.org/10.33258/birci.v3i2.887>
- Özgüler, A. T., Kaya, K., Kağızmanlı, B. & Altuğ, M. (2016). Occupational safety education competency of engineering faculty students. *Journal of Education and Training Research*, 5(Special Issue), 75–86.
- Ozturk, Y. (2020). Attitudes of vocational high school students about occupational health and safety. *International Journal of Advances in Engineering and Pure Sciences*, 111–117. <https://doi.org/10.7240/jeps.512524>
- Sonmez, V. & Alacapinar, F.G. (2019). *Örneklendirilmiş Bilimsel Araştırma Yöntemleri (Illustrated scientific research methods)*. Ankara: Anı Publishing.
- Topgül, S. & Çağatay, A. (2017). Öğrencilerin İş Güvenliği ve İş Güvenliği Eğitimi Algisinin Değerlendirilmesi. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 22(2), 587-598.
- TMMOB. (2018). *Occupational health and safety chamber report*. Accessed from <http://www.mmo.org.tr> on 30 May 2021.
- Wang, B., Wu, C., Kang, L., Reniers, G. & Huang, L. (2018). Work safety in China's Thirteenth Five-Year plan period (2016–2020): Current status, new challenges and future tasks. *Safety Science*, 104(February 2018), 164–178. <https://doi.org/10.1016/j.ssci.2018.01.012>

Recommending Citing:

Çağlıyan, A. (2022). Occupational Health and Safety Lesson Plan Impact on Student Access in Vocational Education. *Journal of Innovative Education Studies – JIES*, 3(1), 1-10.

Conflict of Interest

It has been reported by the authors that there is no conflict of interest.

ORCID

Author 1 Aydın Çağlıyan  <http://orcid.org/0000-0003-2731-343X>