

Study on the Learning Effectiveness of the Tobacco Control Window Design Course in Line with the Visual Marketing Standards of the World Skills Competition

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Objectives: Almost all smokers started smoking cigarettes before the age of 18 then became addicted to tobacco. Therefore, tobacco prevention education must be carried out throughout high school and university. Shunde Polytechnic integrates tobacco control health education into the window design curriculum, which allows students to complete and display tobacco control window design works on campus to cause discussion, thus achieving the promotion of tobacco control publicity and education. Based on the competition standards of the Visual Merchandising project of World Skills Competition, the original teaching methods were reformed in this research and the nine standards of the competition were divided into four modules for teaching. The required knowledge, specific skill requirements, and workflow were well integrated into the teaching of smoke control window design tasks to foster students' abilities to display innovative design, window production, installation and operation, and teamwork. And the teaching results were verified according to World Skills Competition scoring methods and standards. The results showed that with the import of the Visual Merchandising project competition standard of World Skills Competition into the original window design course, on the one hand, the effects of students' works and their self-satisfaction with their works have shown a significant improvement. On the other hand, although this kind of teaching method does not relieve the students' mental, physical, time, and frustration pressure, it has stimulated and cultivated students' good professional qualities. However, this research focuses on the assessment of professional skills and professionalism. Therefore, future research will more focus on evaluating the effectiveness of window design courses under the new teaching model in preventing youngsters from smoking or encouraging students to quit smoking, popularizing correct knowledge about the health hazards of tobacco, and establishing positive life beliefs.

Keywords: window design; tobacco control; vocational education; world skills competition

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Cigarette smoking is a major cause of premature death: tobacco use kills 5.4 million people a year and accounts for 1 in 10 adult deaths worldwide.^{1,2} However, people usually start smoking tobacco in early adolescence, who then become addicted to tobacco. Almost all smokers start smoking tobacco before the age of 18³. Many adolescents do not understand tobacco addiction and do not know or underestimate the serious consequences of tobacco's harm to health. Therefore, it is necessary to carry out tobacco prevention education for adolescents during high school and university.⁴ Schools are considered an ideal place to provide tobacco prevention programs since adolescents mainly start smoking at this stage.⁵

At present, Chinese colleges and universities are aware of the importance of tobacco control education among adolescents, and therefore encourage teachers to introduce the concept of tobacco control health education into the classroom to enhance students' awareness of healthy social and life attitudes. However, the course of this study is window design. The researcher integrates tobacco control health education into the window design curriculum, allows students to complete the tobacco control window design works, display them on campus, and then carries out topical discussions to implement tobacco control publicity and education among adolescents. The goal of this course is to train excellent window designers with both practical ability and professional knowledge for the design industry. At the same time, introducing tobacco control health education into classroom teaching is a simple and effective way to control tobacco.

World Skills Competition, known as the "Skills Olympics", is an important platform for members of the World Skills Organization to display and exchange professional skills.⁶ Competitors aged 18 to 21 years old from various countries who have received professional vocational skills training compete in the competition. The main purpose of the competition is not to win medals,

but to celebrate excellence and encourage and promote greater progress and achievements in this field.⁷ Leading the development of vocational education with the advanced concept of the World Skills Competition can further improve the training level of vocational education and skilled talents. At the same time, the World Skills Competition effectively cultivates positive life beliefs among young contestants, so that they gain social recognition and improve their sense of self-worth, thus staying far away from various negative social images. On the other hand, contestants are usually regarded as role models for young people on campus or in the community, who can inspire their peers around to master a vocational skill, obtain a vocational qualification certificate, and face life optimistically.⁸ This positive social image coincides with the concept of tobacco control health education.

However, this research is based on the competition standards of the Visual Merchandising Project of World Skills Competition, which orients to the task of designing smoke control window, and reforms the original curriculum teaching mode, put forward a new teaching model and evaluated whether this teaching method can effectively improve students' professional skills and occupational quality in the course. The ultimate goal of this study is to test our achievements by achieving the following goals:

1. Evaluating the performance of students' professional skills and occupational quality after skills training.
2. Evaluating the task load of students for finishing design works after skills training.

This study sets seven assumptions:

Hypothesis 1: the students' design achievements are improved after skills training.

Hypothesis 2: students can use easier mental activities to complete design works after skills training.

Hypothesis 3: students can use easier physical activities to complete design works after skills training.

Hypothesis 4: students can use a shorter time to complete commodity display design works after skills training.

Hypothesis 5: students are more satisfied with the commodity display design works completed after skill training.

Hypothesis 6: students make fewer efforts to complete design works after skills training.

Hypothesis 7: students feel less frustration in the process of completing design works after skills training.

To test the above hypothesis, the researchers arranged the examination and training sites according to the competition standard of Visual Merchandising Project of World Skills Competition, which provided objective conditions for the experiment. This teaching model has been applied to the task of designing smoke control windows in the window design course of Shunde Polytechnic, which has been used as a case study (Figure 1).



Figure 1: Students receive skills training

LITERATURE DISCUSSION

Vocational education

The importance of vocational education can be learned from our daily lives. Works like infrastructure construction in modern cities, treatment of patients, maintenance and repair of machinery and equipment, services provided by hotels and leisure industries and innovation of telecommunications technology all require talents with relevant professional knowledge and competentskills.⁹ First of all, from the policy point of view, the relationship between vocational education and economic competitiveness is more closely linked.¹⁰ Improving the quality of vocational education has a positive impact on competitive advantage and can improve social

productivity and promote industry innovation. Secondly, vocational education is regarded as an opportunity for students who fail to advance to academic education to continue their education.¹¹ It is the way to help young people live a fulfilling and rich life.⁹

Tobacco control education

Tobacco and adolescents

Thanks to the efforts of society to control, prevent traditional tobacco and carry out education, the data on adolescents' smoking of traditional tobacco have steadily declined since the mid-1990s. However, the overall rate of tobacco use among adolescents has remained unchanged. This is mainly due to the popularity of

e-cigarettes in recent years, which has led to the continued high rate of tobacco use among adolescents.¹² The survey found that nearly three-quarters of young people believe that e-cigarettes are less harmful and addictive than tobacco. However, there are obvious uncertainties about the safety of e-cigarettes, which will increase the rate of combustible tobacco use among adolescents in the future. This trend is worrying.¹³ Because of the high consumption rate and high misunderstanding rate of e-cigarettes among adolescents, education is urgently needed to implement the publicity and education on the social and health hazards of e-cigarettes among adolescents, thereby preventing and reducing the consumption of e-cigarettes.¹⁴

Introduce the concept of tobacco control health education into the classroom

The data shows that most adult tobacco consumers tried to consume tobacco before the age of 18, which suggests that tobacco-related prevention and education are critical during adolescence¹⁵. Tobacco prevention and education programs are usually set up in schools, and school-based tobacco prevention programs aim to prevent adolescents from consuming tobacco by providing information about the negative health consequences of tobacco consumption and building rejection skills.¹⁶ Studies have proved that school-based curriculum education can indeed reduce the incidence of tobacco smoking among adolescents.⁵

Shivani Mathur Gaiha's team at Stanford University developed a tobacco prevention toolkit to enhance tobacco education based on the school curriculum. The toolkit provides free online teaching resources, including 6 modules: (1) the basics about tobacco (focusing on cigarettes); (2) e-cigarettes/vapes and pod-based systems such as JUUL; (3) hookah; (4) smokeless tobacco; (5) nicotine addiction; (6) positive youth development, as well as an about us and a Resources page. Teachers can incorporate tobacco education into courses other than health education according to the different ages of students and the content of the courses taught.¹⁶

This research is based on the window design course of Shunde Polytechnic and teaches the smoke control window design project as a course task to cultivate professional and technical talents

with excellent vocational skills, healthy physique, and positive life beliefs.

Window Design Course

In the past two decades, the retail industry and retail design have undergone earth-shaking changes.¹⁷ In this process, it is increasingly emphasized that retail designers need to interpret and judge the retailer's brand value and integrate consumer demand into the space design.¹⁸ Retail designers are required to have eight major professional abilities, including design, research, socio-cultural sciences, branding, marketing & strategy, omnichannel & digital, communication, and organization & management.¹⁹ Therefore, the vocational education of retail design also puts forward a higher demand for talent training, and it is necessary to train more excellent retail store designers with the practical ability and professional knowledge for the industry.

The display window is an important part of retail store design. At present, the window design courses of higher vocational colleges in China introduce various types of window design projects through various channels and carry out project-based teaching by the workflow of market-oriented design studios.²⁰ However, for a long time, there are two important problems in teaching: first, it pays more attention to "theory" and less attention to "skill" and emphasizes the training of innovative thinking and drawing skills, lacking the teaching of students' "professional skills, practical operations and skills"; Second, the construction of the content system of the window design course fails to closely follow the industry standards, fails to form an effective connection with the world vocational skills standards, and lacks the training of "industry thinking and professional standards" among students.²¹

World Skills Competition

The World Skills Competition began in Europe after World War II. In 1947, Spain realized that the rapid development of society was extremely in need of a large number of technical personnel services, and thus held a national skills competition. In 1950, Spain and Portugal jointly held the first transnational vocational skills competition. The official World Skills Competition was held in Spain in 1953, including

seven European countries, namely France, Germany, Morocco, Portugal, Spain, Switzerland, and Britain.²² After that, the competition developed into a world skill competition in which many countries around the world participated together.⁸ Also known as the Olympics in vocational skills competitions,⁶ the competition is held every two years. There are six major competitions including transportation and logistics, construction and building technology, creative arts, and fashion, information and communication technology, manufacturing and engineering technology, and social and personal services. Each major category is divided into several small events.⁸ At present, the World Skills Competition is the world skill competition with the highest specification, the largest number of participating countries and regions, the widest coverage, and the greatest influence. The ultimate goal of the Competition is to improve the standards of vocational education and enhance the image of skills and technology in society and encourage young people to participate in skills training, to enhance the competitive advantage of skilled personnel in the industry.⁷ As Jack Dusseldorp—President of WorldSkills—put it: ‘WorldSkills is a powerful means for building a global skills’ culture. It enables the best of the world’s young skilled people to motivate and inspire successive generations to see that vocational skills can lead to secure and fulfilling lives in a fast-changing competitive world.’

Visual merchandising of World Skills Competition

The World Skills Competition consists of six major events, among which visual merchandise is a sub-item under the creative arts and fashion event. A visual merchandiser creates window and interior displays in shops and department stores thus is essentially responsible for the "look" of the retail outlet. The chief aim of a visual merchandiser is to maximize sales by communicating with the target audience and creating a positive atmosphere.²³ However, visual merchandiser's WorldSkills occupational standards include work organization and management, communication and interpersonal skills, problem-solving, innovation, and creativity, interpretation and research brief, design,

implementation. In the skill competition, the competitors are required to complete the production of a set of show-window for sales independently, and the expert team comprehensively evaluates the occupational ability of the competitors according to the six parts of the WorldSkills Occupying Standards.

Integrating competition mode into classroom teaching of design

World Skills Competition provides a unique communication platform for the global industrial and service industries, as well as a set of universally accepted professional competence evaluation standards. The continuously increasing influence of the World Skills Competition and the increasing number of member countries have proved that traditional trade, craft skills, and new technologies have made important contributions to the economic and social well-being of all countries in the world⁷. Relying on skill competition, we should pay more attention to cultivating students' comprehensive practice, independent learning, and teamwork ability, and improve their psychological quality, occupational quality, and innovative consciousness. Emphasis should be placed on cultivating students' ability to use comprehensive knowledge and technology to solve comprehensive practical problems in the real professional environment.⁶

In this study, based on the competition standards of the Visual Merchandising project in the World Skills Competition, the original window design course teaching method is reformed. The nine standards of the competition are divided into four modules for teaching, and the required knowledge, specific skill requirements, and work process are organically integrated into the design tasks of the smoke control window. The cultivation of students' ability in innovative design display and window making, installation, and operation, teamwork, etc. is highlighted, and World Skills Competition scoring method and standards are taken to test the teaching results, thus accurately training professional and technical talents.

RESEARCH METHODS

According to the standards of the Visual Merchandising project in the World Skills

Competition, the researchers arranged the examination and training sites, which provided objective conditions for the experiment. In this study, taking the window design courses of Display Art and Design Major in Shunde Polytechnic as an example, the following 10 main steps are taken to carry out the research:

Step 1: Arrange the sites, tools, and consumables needed for assessment and training

Step 2: Design objective measurement questionnaire and subjective measurement questionnaire

Step 3: Select the testees from the students in the window design course and divide them into five groups

Step 4: Inform the testees that the window works need to be designed around the theme of tobacco control.

Step 5: Design and production of the first smoke control window work before the testee's technical training.

Step 6: Experts score the first batch of window works, and participants fill in the subjective measurement questionnaire

Step 7: participants receiving teaching and training of window display technology for 2 weeks

Step 8: Design and production of second smoke control window works after technical training

Step 9: Experts score the second batch of window works, and participants fill in the subjective measurement questionnaire

Step 10: Analyze and discuss the results

Site environment

Site area

The practical technical workstation of each group's window is about 5*5m. Each station is equipped with a standard simulation window, console, as well as computer equipment, tools, and consumables required for assessment and training.

Site lighting

The light source should be reasonably arranged in the experimental site, and glare should be prevented so that the light source can form a shading angle above the line of sight of 45 degrees. Or opaque materials should be used to shield the light source. All lamps must pass 3C certification.

Lamps with a color temperature of $> 4000\text{K}$ light source, color rendering index $Ra \geq 75$, and lighting level 500-1000lx are used.

Participants

In this study, 33 students from Shunde Polytechnic were selected as participants, with an average age of 18 ± 2 years. All participants had the foundation of artistic design. They were randomly divided into five groups, each consisting of 6-7 students.

The technical teaching and training process of the window display

The teaching process of window display technology is to divide the nine standards into four modules according to the competition standards of window display technology event in the World Skills Competition and guide students to train. The whole teaching process is divided into four modules: investigation and analysis, design scheme, planning and production, implementation, and installation. Through modular teaching and project-based skills training, students' basic skills of window display technology and comprehensive ability of technology application are mainly cultivated.²¹

Module 1: Investigation and Analysis

Students are taught to interpret the requirements of the audience and the publicity theme. They are also guided to use network survey method, quantitative research method and qualitative research method to make survey plan, accurately grasp the theme of tobacco control, and organize the survey data into PowerPoint documents.

Module 2: Design Scheme

Based on investigation and analysis, the students are taught to put forward keywords that are appropriate to the brand theme and search for relevant design intention diagrams through the Internet. According to the keywords and intention diagram, the overall design scheme of the window display window, which is both creative and practical, is designed in the limited simulation window.

Module 3: Planning and Production

Students are taught to abide by the health and safety rules during the construction process and make time and personnel allocation plans. They

are taught to meet industry standards in painting, cloth wrapping, and adhesive tape production, make exquisite and flawless props, keep their stations clean and tidy, safely operate tools, and use consumables effectively. Their professional ethics, teamwork and the ability to make window display scenes are also cultivated.

Module 4: Implementation and Installation

The themed display windows made by the students should keep consistency with the design renderings, to convey the theme and concept of tobacco control. The colors of the design works should be coordinated, and the layout mix should be balanced to conform to the visual law, and the lighting can be reasonably used to render the atmosphere and highlight the themed.

Students are trained for two weeks according to the skill points of the four modules, so as to consolidate their window display skills and occupational quality through a "combination of theory and practice".

Performance measures

Formulation of objective measurement questionnaire

To explore whether the students have a significant learning effect after skills training, the hypothesis of the study is verified. Objective and

subjective measurement methods are adopted in this study.

Based on the competition standards of Visual Merchandising Event of World Skills Competition, the objective measurement questionnaire is optimized according to the course situation, which includes three modules: preliminary investigation, design planning, and construction and production, with a total of 23 questions. The objective measurement questionnaire measures with a 3-level scale (from 1 to 3), in which 1 means "totally inconsistent with industry standards", 2 means "reaching acceptable industry standards", and 3 means "exquisitely made". In this study, three experts from the field of window display design with over five years of design experience were invited to score the works of five groups before and after skill training, and Cronbach's alpha was used to verify the internal consistency reliability of the questionnaire. The purpose of reliability analysis is to analyze the measurement quality of questionnaire questions²⁴, to verify whether the questionnaire has good reliability.

Subjective measurement questionnaire

Subjective measurement questionnaire adopted the mission load NASA-TLX index developed by Hart and Staveland (1988) as the subjective measurement standard of this study.

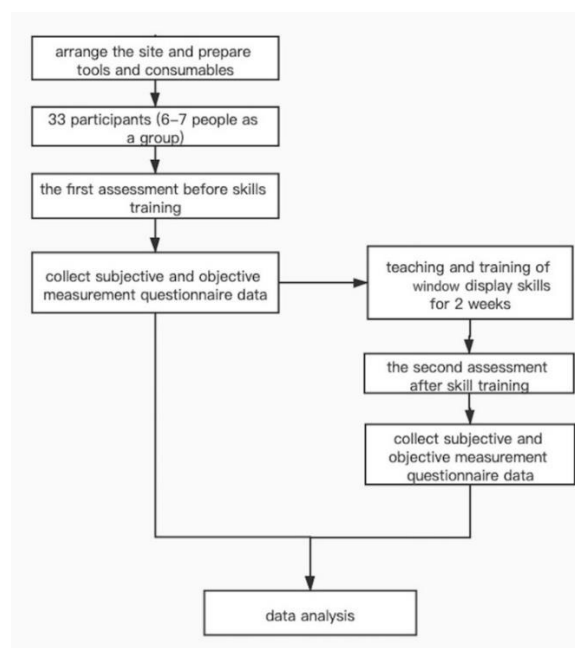


Figure 2: Experimental steps of research (edited by the author, 2021)

Experiment procedures

Figure 2 shows the experimental steps in this study. Participants were randomly divided into five groups with 6-7 participants in each group.

Before the skill learning and training, the researcher requires all groups to complete the first window display design around the tobacco control theme within three days (Figure 3), including making a set of window works and submitting a complete window design plan ppt. After completing the design, all participants filled in the first subjective measurement questionnaire under the same environment. The three experts scored the first window design works of five groups under the same environment and filled in the objective measurement questionnaire.

After the testees complete their first smoke control thematic window design, a 2-week skill study and training immediately follow.

After two weeks of skill study and training, the researcher arranged all groups to complete the second window display design with the same place same time, same thematic as the first window design. The design includes making a set of commodity windows and submitting a complete design ppt (Figure 4). After completing the design, all participants filled in the second subjective measurement questionnaire under the same environment. The three experts also scored the second window design works of five groups under the same environment and filled in the objective measurement questionnaire.



Figure 3: Design work before skills training



Figure 4: Design work after kills training

EXPERIMENT RESULTS

Consistency among experts

Three professional judges scored the window design works of five groups before and after skills training. The scoring table includes three modules: preliminary investigation, design planning, and construction and production, with a total of 23 questions. In this study, the reliability of the score table was analyzed, and the analysis results showed that the internal consistency coefficient of Cronbach's alpha in the previous research module was 0.729; the internal consistency coefficient of Cronbach's alpha in the design planning module is 0.767; the internal consistency coefficient of Cronbach's alpha of construction and production module is 0.736. All three rating scale modules have acceptable reliability.

The difference between the performances of works before and after skills training

T-test analysis of dependent samples shows that there are significant differences between students' design works before and after skills training (Table 1), with $t(32)=-13.97$, $p=.000$, $d=-3.2$. The scores of works before skills training ($M=50.81$, $SD=2.33$) are significantly lower than those after skills training ($M=61.96$, $SD=4.33$). According to the above data, the students' design achievements are improved after skills training, so Hypothesis 1 is valid.

Table 1
T-test of difference between performances before and after skill training (N = 33)

Dimension	Mean value (standard deviation)		Variance	T value	p	Effect size (d)
	Performance before skills training	Performance after skills training				
Performance	50.81 (2.33)	61.96(4.33)	32	-13.97	.000	-3.2

Measurement results of task load in the process of completing design work by students

T-test analysis of dependent samples shows that there are significant differences in mental needs, physical needs, time needs, self-performance, and frustration between students before and after receiving skills training (Table 2). In terms of mental needs, $t(32) = -2.91$, $p = .006$, $d = -0.57$. ($M = 7.33$, $SD = 1.81$) before skills training was significantly lower than ($M = 8.27$, $SD = 1.42$) after skills training. In the aspect of physical needs, $t(32) = -2.54$, $p = .016$, $d = -0.47$. ($M = 7.42$, $SD = 2.16$) before skills training was significantly lower than ($M = 8.36$, $SD = 1.76$) after skills training. In terms of time needs, $t(32) = -2.35$, $p = .025$, $d = -0.47$. ($M = 7.6$, $SD = 2.35$) before skills training was significantly lower than ($M = 8.54$, $SD = 1.5$) after skills training. In the aspect of self-performance, $t(32) = 2.37$, $p = .024$, $d = 0.45$. ($M = 6.51$, $SD = 3.03$) before skills training was significantly higher than ($M = 5.15$, $SD = 2.98$) after skills training. It should be noted that the lower the score of the self-performance index is, the higher the degree of self-satisfaction is. In terms of frustration degree, $t(32) = -2.05$, $p = .049$, $d = -0.33$. ($M = 6.03$, $SD = 2.57$)

before skills training was significantly lower than ($M = 6.78$, $SD = 1.91$) after skills training.

T-test analysis of dependent samples shows that there is no significant difference in the degree of effort between students before and after skills training, with $t(32) = -1.84$, $p = .074$, $d = -0.35$. ($M = 8.6$, $SD = 1.51$) before skills training and ($m = 9.06$, $SD = 1.02$) after skills training.

Through the T-test data of mental needs, physical needs, time needs, and frustration, students need to use more intensive mental and physical activities and have more urgent time after skills training, and need to solve more difficulties in the process of completing design works to complete the second design and production of window works. Therefore, hypotheses 2, 3, 4, and 7 are not valid.

T-test data from self-performance show that students' self-satisfaction with their works is improved after skill training, so Hypothesis 5 is valid.

At the same time, there is no obvious difference in students' efforts to complete design works before and after skills training. Therefore, hypothesis 6 is not valid.

Table 2
T-test of differences in mental needs, physical needs, time needs, performance level, effort, and frustration before and after skills training (N = 33)

Dimension	Mean value (standard deviation)		Variance	T value	p	Effect size (d)
	Results before skills training	Results after skills training				
Mental needs	7.33 (1.81)	8.27(1.42)	32	-2.91	.006	-0.57
Physical needs	7.42 (2.16)	8.36(1.76)	32	-2.54	.016	-0.47
Time needs	7.6 (2.35)	8.54(1.5)	32	-2.35	.025	-0.47
Performance level	6.51 (3.03)	5.15(2.98)	32	2.37	.024	0.45
Effort	8.6 (1.51)	9.06(1.02)	32	-1.84	.074	-0.35

Frustration	6.03 (2.57)	6.78(1.91)	32	-2.05	.049	-0.33
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CONCLUSIONS

This paper introduces the integration of World Skills Competition's Visual Merchandising project competition standards into the smoke control window design tasks of the original window design course, reforms the teaching method of the course, and proposes a new teaching model. This study verifies whether this teaching mode can effectively improve students' professional skills and occupational quality in the curriculum. The results show that:

1. After using the reformed teaching mode of commodity display course, the effect of design and production of works and students' self-satisfaction with works have been improved.
2. At the same time, after introducing the competition standards of Visual Merchandising event of World Skills Competition into the course, the student's mental needs, physical needs, time needs, frustration, and pressures have not been alleviated. There are two reasons. On the one hand, the introduction of competition standards broadens students' horizons. On the other hand, it also improves their self-requirements for the quality of works. Therefore, the students are more rigorous and serious when they finish the design works. They should think more and maintain the attitude and action to actively solve difficulties. This stimulates and cultivates students' occupational quality.
3. The students can maintain a relatively positive and stable learning attitude both before and after skills training, and there is no change in learning attitude caused by the introduction of competition standards of Visual Merchandising Event of World Skills Competition. This is conducive to the extensive promotion and use of this teaching mode, to enhance the overall occupational quality of future designers.

LIMITATIONS

This research evaluates how the new teaching model improves students' window design vocational skills and professional literacy dimensions, which will help promote the

development of vocational education in the display design industry and lay a foundation for the future development of teaching methods more in line with the industry needs. However, this study focuses on the evaluation of the professional skills and professional qualities in the window display, fails to evaluate whether integration of the tobacco control health education concept into the window design curriculum can effectively prevent adolescents from smoking tobacco. Therefore, future research will focus on evaluating the effectiveness of window design courses in preventing adolescents from smoking tobacco or encouraging students to quit smoking under the new teaching model, popularizing correct knowledge about the health hazards of tobacco, and establishing positive life beliefs.

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Author Declaration

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