

**AC 2010-2240: THE KEY FACTORS TO ENHENCE THE COMPETITIVENESS OF
COMPETITORS IN WORLDSKILLS COMPETITION**

Shih Kuang Hou, National Taiwan Normal University

Ching-Ho Huang, Nangang Vocational High School

Jin-Fu Chen, NTNU

A Study of Key Factors in Promoting the Competitiveness of Participating in WorldSkills Competition

Abstract

Skills competition improves vocational education and training effectiveness. The purposes of organizing skills competition are to establish values in skills, encourage youngsters to participate in vocational education and training, to reflect vocational education and the teaching results of vocational trainings, and to enhance the skills level of technical personnel through mutual learning and emulation. Through competition, it raises concerns from enterprises, the society and the public to learn skills in order to improve the quality of life. Hence, skills competition has drawn more international concerns in recent years, and that every country is trying hard to do better in the competition results.

In addition to strengthen the potential training of the competitors, to maintain competitiveness in WorldSkills competitions, it is necessary to explore the key factors affecting the results of WorldSkills competitions through scientific research methods in order to seek breakthroughs in upgrading international competitiveness.

Survey method was mainly used in this study to collect the individual personality trait data of 80 respective competitors and their instructors who participated in skills competitions, and statistical analysis was then employed to understand their unique personality traits. For skills competition competitors and instructors, the study adopted Leader Attributes Inventory (LAI) Scale and Adult Career Cognitive Scale respectively as the research tools. Through statistical analysis, the skills competition competitors have shown such unique characteristics as “rhythymia,” “cyclic tendency,” “inferiority feeling,” “depression,” “objectivity,” and “cooperativeness.” On the other hand, the instructors have demonstrated better than average norms in dimensions on “cognitive complexity,” “job involvement,” “self-efficacy,” “career obstacles,” etc.

Based on the findings of this study, we would like to put forward three proposals: 1. Take the results of this study as a reference to screen skills competition competitors; 2. implement personality traits analysis while conducting contestant training, and to strengthen education; 3. conduct case studies on successful competitors in order to explore their individual unique traits.

Keywords: Skills competition, skills training, key factors, personality traits

I. Preface

Possessing professional competence or skills enhances not only one's self confidence but also the competitiveness in the workplace. The aim of vocational education and training is to cultivate outstanding engineering and technological personnel in order to meet the national economic construction needs, and also to allow young students who participate in vocational education and training to acquire excellent engineering and professional technical knowledge in order to enhance the country's economic competitiveness.

Skills competition improves vocational education and training effectiveness. The objectives of organizing skills competition are to establish values in skills, encourage youngsters to participate in vocational education and training, to reflect vocational education and the teaching results of vocational trainings, and to enhance the skills level of technical personnel through mutual learning and emulation. Through competition, it raises concerns from enterprises, the society and the public to learn skills in order to improve the quality of life. Thus, our country has started to organize the annual National Skills Competition since 1968, and has already hosted 39 sessions until 2009. Our government has sent representatives to take part in WorldSkills Competition since 1970, and has already participated in a total of 21 times until 2009. As our competitors have shown good performances in previous WorldSkills Competitions, our vocational education and training effectiveness have received high acclams from here at home and aboard¹.

Furthermore, with an increasing number of participating countries and participants in WorldSkills Competition, to most countries have begun to pay greater attention in skills competition and the overall standards have been upgraded. In order to have better results, most countries are trying their best and so the competition has become increasingly intense.

In addition to strengthen the potential training of the competitors, to maintain competitiveness in WorldSkills competitions, it is necessary to explore the key factors affecting the results of WorldSkills competitions through scientific research methods in order to seek breakthroughs in upgrading international competitiveness.

II. Research Purposes

“Pattern determines the outcomes, and attitude determines the altitude”. Attitude is the key to success. To have higher achievements, one needs to possess positive attitude. Hong indicates that the conditions for success are not wisdom but personality traits². Hsing considers that the so-called personality traits are a narration of individual behaviors, perception, ideas and other characteristics³. Allport argues that personality is a person's inner dynamic organization generated through psychological and physiological systems to determine his or her specific behaviors and ideas⁴. He also points out two concepts of common traits and individual traits. The former refers to common traits shared by a certain group of people, and the latter refers to unique traits that cannot be compared by others. He believes that everybody has the motivation, characteristics and personal unique styles. All skills competition competitors have their unique personality traits as well as common traits. These personality traits may exert a critical impact towards competition training, competition, and even award-winning. Therefore, the main purpose of this study is get down to basic personality traits to explore the common traits of skills competition competitors, and to explore their past successful/award-winning cases, study the

unique individual traits of successful competitors in order to serve as a reference for vocational education and training, as well as in screening and training of competitors. The specific objectives are as follows:

1. To explore the common traits of skills competition competitors.
2. To explore the unique individual traits of successful skills competition competitors.

III. Research Design and Implementation

The methods, research tools, implementing situations, etc. adopted by this study are described as follows:

1. Research methods and implementation

According to the above research purposes, a survey method and expert consulting research method were mainly adopted in this study. The followings are a respective explanation of research methods and results of the study:

- (1) **Survey method:** For the personality traits of skills competition competitors, a survey method was adopted in this study in collecting the data. Twenty selected competitors out of 36 categories of competitors taking part in 2005 and 2007 WorldSkills Competition were mainly taken as the research subjects. In addition, 40 competitors participating in 2008 National Skills Competition were chosen as samples in the survey subjects. Altogether, a total of 40 international competitors and 40 national competitors were selected.
- (2) **Expert meeting:** After completing the research survey and statistical analysis, the administrative authorities, the WorldSkills Competition competitors, instructors, vocational training experts and others taking part in skills competition were invited to attend the expert consultation meeting on June 24, 2009 to discuss and review the results of this study together, and provide relevant advice and opinions.

2. Research tools

LAI scale was adopted as the research tool for surveying the competitors' personality traits in this study in an attempt to explore the special natures of the subjects' personality traits. The personality traits were divided into four factors and 15 traits by LAI scale, each trait of which has 10 questions with a score of 0~2 points. Therefore, each trait is able to score up to a maximum of 20 points, and a minimum of 0 point. This scale is suitable for 12 to 21 year-old students, i.e. junior high to college students. Meanwhile, different norms of junior high, senior high, vocational and college male and female students from 2003 academic year were set up to serve as an objective comparison purpose. The creditability and validity contents of the local students were used as the norms, and the creditability were found to be high. The re-test creditability was between 0.78~0.92, and the validity was between 0.64~0.85.

The four factors and 15 traits of LAI scale include⁵:

- (1) Introversion and extraversion personalities: 1. General activity (G), 2. Ascendancy (A), 3. Social extraversion (S), 4. Thinking extraversion (T), 5. Rhathymia (R).

- (2) Emotional stability personality: 6. Cyclic tendency (C), 7. Inferiority feeling (I), 8. Nervousness (N).
- (3) Mental health factors: 9. Strain (st), 10. Anxiety (An), 11. Depression (D).
- (4) Social adaptability: 12. Objectivity (O), 13. Cooperativeness (Co), 14. Aggressiveness (Ag).

The last trait was Lie (L), i.e. honest indicator. It was used in understanding the questions, whether or not they were consistent and had been filled carefully. While doing the statistics, the questionnaires scoring under 8 points in the study were removed according to L scale.

3. Research subjects and sampling

(1) Research subjects

All competitors participated in 2005 and 2007 WorldSkills Competitions and 2008 National Skills Competition were chosen as the research subjects. Considering the representativeness of the samples, the purposive stratified random sampling method was used to initially divide the research subjects in three categories of 2005 WorldSkills Competition, 2007 WorldSkills Competition and 2008 National Skills Competition. Sampling was then made according to the six groups of actual number of participants classified in the WorldSkills Competition, and a random sampling survey was then carried out to the subjects to do a questionnaire survey. Shown in Table 1 is the research sample plan and sampling conditions.

Table 1. The research sample plan and sampling conditions

Group Session	Social & personal services	Construction technology	Manufacturing Engineering technology	Transportatio n & logistics	Information technology	Arts & fashion	Total sample number
38 th WorldSkills Competition	3	4	4	3	3	3	20
39 th WorldSkills Competition	3	4	4	3	3	3	20
39 th National Skills Competition	6	8	8	6	6	6	40

(2) Questionnaire recovery results

The research subjects were contacted and selected in September and October of 2008 respectively in the study and the questionnaires were then sent. An on-site questionnaire survey was conducted by the research team while the 38th National Skills Competition was held. After intensive follow-up questionnaires in October to December of 2008, 61 responses were finally received from the competitors. The recovery rate was 76.25%. After removing the “Lie (L)” value of the recovered questionnaires that were below 8 points, the valid questionnaires were 57 copies, and the recovery rate was 67.5%.

IV. Results and Discussion

After the questionnaires were collected, sorted, graded and entered into computer for processing, they were analyzed with SPSS10.0 statistical software. After completion of statistical average

analysis on all the personality trait items, they were initially compared with the norms to obtain the norm levels in order to explore the personality trait differences of the skills competition competitors with that of students of the same ages. Norm level 3 indicates that the personality traits are similar to the norms, and greater or smaller than 3 indicates the personality traits are different from the norms. The greater or smaller the norm level is, the greater the differences are. A further t-test and ANOVA analysis were conducted to explore the special characteristics of personality traits of the successful skills competition competitors. A summary of statistical analysis results is explained as follows:

1. The common personality traits analysis of competitors

In all the 14 personality trait items, the average value of the entire research samples that showed norm level 3 were “general activity,” “ascendancy,” “social extraversion,” “thinking extraversion,” “nervousness,” “anxiety,” “aggressiveness”. This indicates that they coincide with the norms. But the other six personality traits were different from the norms:

- (1) Rhythymia: Norm level 4, representing a capability to adapt, carefree and able to maintain a happy mood.
- (2) Cyclic tendency: Norm level 4, representing a feeling that can be easily shaken and is more emotional.
- (3) Inferiority feeling: Norm level 2, representing high degree of self-confident.
- (4) Depression: Norm level 2, representing more optimistic, and less likely to depress worries and melancholy.
- (5) Objectivity: Norm level 2, representing more objective, non-opinionated and willing to discuss and accept other people’s self-intentioned suggestions.
- (6) Cooperativeness: Norm level 2, representing more cooperative and willing to collaborate with others.

2. Personality traits of successful skills competition competitors

The discrepant comparison results of research samples indicate that:

- (1) Competitors in international competitions and national competition comparisons: Competitor who wins the gold medals in National Skills Competition can take part in the WorldSkills Competition. All of the competitors in international competitions perform better in skills competitions than those in national competitions. The comparison analysis was to determine the difference of personality traits between the two groups of competitors. The t-test analysis has found differences in “general activity” ($t=-2.368, p<.05$), “thinking extraversion” ($t=2.046, p<.05$), “objectivity” ($t=3.445, p<.05$), and “cooperativeness” ($t=2.501, p<.05$). This indicates that international competitors: (1) have higher interests in activities, working quicker and agile; (2) are more attentive, and would think first before taking action; (3) are more objective, non-opinionated and willing to discuss and accept other people’s well-intentioned suggestions; and (4) are more cooperative and willing to collaborate with others.
- (2) Comparison between the winners and non-winners of the awards: An ANOVA and Scheffe post-hoc comparison have found differences in “thinking extraversion” ($F=4.983, p<.05$) and “objectivity” ($F=4.978, p<.05$). This explains that the competitors who did not win the awards:

(1) are more careless and tend to act without thinking of the consequences; and are (2) more subjective and opinionated.

V. Conclusions and Suggestions

The followings are the descriptions of the conclusion and suggestions of this study based on the aforesaid research purposes and findings:

1. Conclusions

- (1) **Skills competition competitors possess common personality traits:** LIE scale was used in the study to investigate and analyze the personality traits of skills competition competitors, and the differences between the traits of competitors and ordinary people (norms) were compared. The results showed that skills competition competitors feature unique characteristics in “rhythymia,” “cyclic tendency,” “inferiority feeling,” “depression,” “objectivity,” “cooperativeness” and other traits. The common traits that skills competition competitors possess include: an ability to keep a happy mood all the time, carefree, worry-free, self-confident while facing problems, optimistic, able to analyze problems objectively, willing to discuss with people and accept other people’s well-intentioned suggestions, not opinionated and willing to cooperate with others.
- (2) **Successful skills competition competitors possess unique personal traits:** When the international competition competitors, especially those award-winning ones were further analyzed and compared with the majority of the competitors, the results find that they possess such unique characteristics as: quick working, agile, more attentive, think first before taking action, more objective, non-opinionated, willing to discuss and accept other people’s well-intentioned suggestions, more cooperative and willing to collaborate with others. These have highlighted the unique personality traits of successful skills competition competitors.

2. Suggestions

Based on the research findings, we would like to put forward three proposals to serve as a reference for skills training of competition competitors and follow-up researchers:

- (1) **Take the results of this study as a reference to screen skills competition competitors:** This study show that skills competition competitors possess common personality traits, and those award-winning WorldSkills Competition competitors feature unique personality traits particularly. The research findings are able to serve as a reference for screening the pre-training competitors. Prior to deciding the competitors, the results suggest an understanding of the participants’ special characteristics first through research tools and using the results as a reference for screening. This could ease the skills competition training operation.
- (2) **Implement personality traits analysis while conducting contestant training, and to strengthen the training:** Many education experts who suggest “to set life at six years old” theory, believe that the personality traits of a child have already been formed from zero to six years old, and the future success or failure has already been determined. But some personality and education cultivation scholars argue that character education learning is a lifelong work. The entire personality learning is to emphasize self-understanding and applications, and a person’s key success or failure relies on what he or she can do to himself

or herself. So it is said that “If you know both yourself and your enemy, you can win a hundred battles without a single loss.” Although personality has been cultivated during our childhood, we can understand ourselves better through education and to strengthen our deficiencies. Therefore, if we are able to implement personality traits analysis prior to contestant training, allowing the competitors to realize their deficiencies and strengthen the shortcomings, it will enable them to “understand themselves” better and definitely be able to help them to march towards success in skills competitions.

- (3) Conduct case studies on successful competitors in order to explore their individual unique traits:** Each success case has its own background and stories, and these vary depending on people and events. The survey method this study adopted in data collecting is rather difficult to explore in-depth unique characteristics, particularly on competitors with different growing and learning experiences. Even for competitors with unique personality traits, their training methods and the training programs they’ve took may also affect their characteristics. Hence, we suggest follow-up researchers to take a case study approach to perform in-depth study on individual successful cases in order to explore their special and unique characteristics.

Bibliography

1. Council of Labor Affairs (2009). The 39th WorldSkills Competition 2007 report, 38th National Skills Competition 2008 report. Retrieved on 2009.6.24.
<http://www.labor.gov.tw/level.asp?contentURL=/service/textcontent2.asp&parent=13&rfnbr=146>
2. Hong-Lan (2002). What children like most is parents’ companionship. Global Views Monthly, February 2002 issue.
3. Chang Chun Hsing (1989). Chang’s Psychology dictionary. Taipei: Tung Hua Publications.
4. Allport, G.W. (1961). Pattern and growth in personality. New York: Holt, Rinehart & Winston.
5. Lai Pao-Chen (1997), LAI’s personality test guide. Taipei: psychology.