



Constructing a professional competence scale for foodservice research & development employees from an industry viewpoint



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ABSTRACT

This study aims to develop a scale for foodservice research and development (R&D) employee competence from the industry viewpoint. We tested factorial structure and validity by conducting confirmatory factor analysis (CFA) to test for measurement invariance, as well as to determine the scale's reliability. The results indicate good discriminant validity, convergence validity and reliability. Five dimensions were identified: product knowledge capacity, activeness and endurance, management capability, innovation and change, and characteristic maturity. The results of the model comparison show that the two-factor model has significant improvement in fit over the null model and one-factor model.

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1. Introduction

The competitive market and the greater consumer awareness require providing high quality foodservices which are associated to adequate sensory attributes, low cost and especially with human health (Ju, 2007). Changeable product trends have become key factors in the pioneering and sustainable development of enterprises. "New product development" (NPD) has become a tool of the foodservice industry in obtaining a competitive advantage in the market. For the food industry, fast food franchises, convenience food product development and chain foodservices invest great amounts of capital and manpower in searching for new production equipments and ingredients which will attract more consumers and enhance sales. Unlike other industries, the range of prices in the foodservice product industry is large. Customers have significantly different preferences, the lifecycle of products is short; the expiration period of goods is short, and competition is severe. In addition, consumers have more and complex options, and the cost of ingredients has increased. Hence, the foodservice industry must rapidly conduct new product R&D and reorganize product development strategies to exploit opportunities in the market. In the past, new product R&D performance of food products and foodservice was mainly evaluated by output. New product

R&D is difficult, since food preferences vary with each consumer's environment and characteristics. Therefore, thorough consideration should be given to R&D personnel. Traditionally, new product development has tended to consist of slight changes in volume, type and taste. R&D innovation is based on changes in the specifications of products instead of improvements regarding consumer needs. A key factor in R&D capacity is the cultivation of talent. Foodservice R&D differs from the rest of the manufacturing industry.

Spencer and Spencer (1993) indicated that we can objectively apply competence to human resource management activities such as recruitment, performance, management, educational training, career development and successor plans. In a severely competitive environment, enterprises must maintain continuous R&D in order to obtain competitive advantages, maintain the position of products and construct niches for sustainability. Cultivation and selection of R&D manpower in the R&D of new foodservice products are important for product success. The scope of foodservice R&D has become much broader. It not only needs to consider the cohesion of R&D teams and teamwork but should also be based on the acquisition of ingredients, product manufacturing, product service, consumer feelings, etc. Therefore, the professional competence of foodservice R&D personnel refers not only to product manufacturing, but also to personality traits, management competence, related services and consumer behavior cognition. With high innovation capacity, R&D personnel will develop better products and processes, lower production costs and effectively reinforce corporate performance (Kafourous et al., 2008).

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In past times, the R&D of food products and foodservice was mostly managed by personnel in food science-related departments. However, in recent years, foodservice departments have continuously cultivated graduates with a specialty in foodservice. Hence, more and more graduates now participate in foodservice R&D. [Spencer and Spencer \(1993\)](#) suggested that competence includes individual basic potential characteristics such as professional knowledge, techniques, personality traits, motivation, etc. However, current R&D in the foodservice industry focuses on research on cooking innovation. [Johnson et al. \(2005\)](#) indicated that the chefs' innovation and energy provide the advantageous bases of Michelin-starred restaurants. According to [Balazs \(2002\)](#), all successful chefs are supported by great teams, and their dishes are creative. Thorough research on R&D personnel competence is rare. R&D competence includes professional knowledge and skills which can be observed; it should also refer to personal traits. Recognizing foodservice R&D personnel competence will serve as a reference for the learning and personal study of graduates or those who are interested in R&D. Industries will find the appropriate talent to increase corporate profits and performance. Therefore, this study probes into the competence of foodservice R&D personnel from the perspective of high level business employees, and treats foodservice enterprises with R&D as subjects. By in-depth interview and literature comparison, this study obtains the items of professional competence required for researchers. The subjects interviewed include R&D personnel from fast food chain stores, in-flight catering, instant and fresh food industries and chain foodservice industries. The researcher designed a competence questionnaire, tested R&D personnel competence and constructed validity and reliability of scale.

2. Literature review

2.1. Professional competence

Competence was addressed by McClelland in 1973; professional competence is a capability required in workplace; it includes personal potential capacity. Behavior is the capacity for specific performance, and is associated with job performance ([McClelland, 1973](#)). Competence refers to precision, skills and exemplary behavior. Employees must reinforce these aspects in order to be competent and improve their performance ([Mansfield, 1996](#)). [Spencer and Spencer \(1993\)](#) proposed the concept of the "Iceberg Model" and classify competence under explicit and implicit characteristics. Explicit characteristics are visible. Knowledge and skills can be enhanced by education and training. Implicit characteristics include motivation and internal/personality characteristics. Self-concept refers to the profound and inner core of a person which cannot be easily changed. It is potential competence which can be gradually upgraded by educational training, psychological consultation and experience sharing. [Lysaght and Altschuld \(2000\)](#) suggested that at the core of professional competence are knowledge, skills, standards, competence and identification.

2.2. R&D employee foodservice competence

R&D employees include the total participants in R&D, including the researchers who are directly involved in, and the technicians who assist with, the research, as well as the supporters. [Spencer and Spencer \(1993\)](#) classified expert competence into: achievement orientation, impact, influence, conceptual thinking, analytical thinking, activeness, confidence, interpersonal EQ, concern for order and quality, curiosity, teamwork, professional knowledge and customer service orientation. [Abbey and Discon \(1983\)](#) sug-

gested that R&D employee competence will be a key factor in the future growth of enterprises. Personality is a personal persistent attribute which cannot be easily influenced by external forces ([Helmreich, 1984](#)); however, it presents different dynamic characteristics in different environments ([Lin & Chiu, 1999](#)). [Kirton \(1976\)](#) generalized the common characteristics of R&D personnel as follows: originality, low efficiency and resistance to control. [James \(1991\)](#) suggested that most researchers are highly stimulus-oriented; therefore, R&D employees should be offered more duties and independence.

An R&D employee's main task is to accumulate, create and apply new knowledge in order to develop diverse products and solve problems concerning food products. R&D employees should like learning, making an effort and knowledge acquisition. They should be willing to deal with challenges. [Guenter \(1985\)](#) indicated that personality traits are key factors in personal creativity. According to [Kanter \(1988\)](#), individual creativity will influence organizational innovation. [Petroni and Panciroli \(2002\)](#) proposed that innovation capability does not simply mean traditional R&D competitiveness and product innovation. It also includes support capacity, innovative-oriented culture, personal skills and managerial practices

There has been less research on foodservice R&D competence; past literature mainly refers to dish development and creativity. Foodservice R&D personnel are mostly chefs. In terms of R&D professional competence in cooking, [Hornig and Lin \(2009\)](#) focused on research into creative cooking product evaluation tools. Applying a consensual assessment technique (CAT), their scale includes 8 dimensions: professional skills, smell, flavor, taste, colors, plate presentation, decorations, utensils, ingredient selection and overall evaluation. [Hu \(2010\)](#) suggested that a creative cooking competence model should include culture, aesthetics, technology, products, services, management and creativity. [Nastase et al. \(2011\)](#) indicated that creative thinking helps to increase the capability of market competitive analysis. According to [Marano \(2013\)](#), a modern chef requires science and art, and should learn cooking culture. In addition chefs' competition is enhanced by the power of the media. Academic education is critical for the growth of chefs' skills. Modern chefs should have R&D capacities. Along with some basic skills, flavor, evaluation of nutrition, and product innovation knowledge are also important factors.

Cooking is a creative industry. As artists, chefs with innovative capability demonstrate their freedom by breaking through limitations. They deal with ingredients they have selected in their specialties; thus, the dishes become meaningful ([Balazs, 2002](#)). [Amin and Thrift \(2002\)](#) indicated that when products are different and there is change, new experiences are the result. Innovation is the key factor. The research of [Hu and Liu \(2012\)](#) suggested that currently, students in the department of hospitality management lack new product competence and innovative management competence in cooking. In addition, when cooks provide delicacies, they should follow local festivals, use local ingredients and samples unique to local cultures and societies ([Santich, 2004](#)). According to [Kay and Russette \(2000\)](#), leadership, interpersonal relationships, creativity and administration skills are the capabilities needed by hospitality managers. [Ottenbacher and Harring, \(2007\)](#) proposed that the criteria for innovative products should include seasonal ingredients, product quality, cooking methods, cost and profit, price fixing of menus, types of menu, customer acceptance, operational factors, etc. According to the literature, early R&D was commonly mentioned in the manufacturing industry. Besides general professional skills and knowledge, R&D should be based on personal traits related to competence, such as responsibility, motivation, communication, positive thinking and facing challenges.

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