# Information Needs of Vocational Training From Training Providers' Perspectives

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## ABSTRACT

In a transition economy, there is an increasing need for vocational training and career counseling for workers to cope with changes in the job market. This study seeks to enhance career guidance services by means of an information and communication technology-based (ICT-based) career information and guidance system. Although electronic learning (e-learning) has received much attention from researchers in the recent decade, the number of studies on how to make use of ICT in helping individuals acquire relevant information and advice that supports a career change and development is relatively small. Undoubtedly, an effective ICT application will improve the efficiency and effectiveness of career decision processes and enhance the quality of counseling services that assist human development in a transition economy. The study aims at revealing the perspectives of training providers in offering counseling services to individuals, through an ICT-based career information and guidance system, prior to the enrollment of on-the-job training or retraining programs. Data collected through semi-structured interviews were analyzed based on a constructivist grounded theory approach. Findings from participants from five institutions showed positive views on the use of ICT-based means that enables the collaboration of career counselors, educators, and professionals from different industries for providing tailor-made career guidance services. Further, functional requirements of the system and potential factors influencing system acceptance were discussed.

## KEYWORDS

Career Guidance, Career Information Management and Guidance System, Information Seeking Behavior, Qualitative Research, Vocational Training

## INTRODUCTION

A recent, common phenomenon in the human resources and training sectors is the integration of information and communication technology (ICT) in the provision of the training and career guidance services to employees, which enables organizations and individuals to remain competitive in society. Evidence showed that the use of ICT by the government, businesses, and individuals was positively

related to on-the-job training (Kottemann, 2009). As suggested by Chen (2010), there was a significant association between electronic learning (e-learning) and overall job performance, which provided a basis for the investment in e-learning systems by corporations. In the past decade, e-learning in the workplace has received substantial attention in the literature, and there has been an increasing trend of research interests (Cheng et al., 2014). For example, when we conduct a query of "e-learning system" and "Workforce" in the Google Scholar, we found that there are more than 2,320 articles published so far in April 2019. Research on e-learning in the workplace covers many topics. Some of them are focused on the design of information systems, such as the performance-oriented e-learning system (Wang et al., 2011) and the ontology-based e-learning system (Jia et al., 2011). There are also studies using other theories to design new e-learning systems, such as using the activity theory to build-up adaptive e-learning systems (Peña-Ayala et al., 2014), and Csikszentmihalyi's flow theory to conduct empirical analysis (Katuk et al., 2013). Some studies are interested in probing into the relationships between training and knowledge economy (Batra, 2009).

However, studies that focus on assisting individuals in the identification of appropriate career information for making career decisions, such as the selection of a suitable training course, have rarely been conducted. Some researchers, for example, Roztocki and Weistroffer (2015) recommended that more research on the use of ICT in transition economies focusing on the micro level, including organization departments, teams, or even individuals is indispensable. On the other hand, others, such as Bullock-Yowell et al. (2012) suggested that research regarding career guidance for the needs of the workforce was insufficient. Clearly, acquiring skills through learning from expertise is one of the means for humans to achieve freedom (Qureshi, 2010) and to reduce poverty in an economy (Assar et al., 2010). An effective online career information and guidance system provides a cost-effective solution to assist organizations in improving their human capital in a timeless approach, whereas appropriate career information and recommendations provide career guidance to support individual career decision making. The lack of research on this subject indicates the need for additional studies on the concentration of career information needs and assistance for individuals in making career decisions, especially for training purposes.

As discussed, there is a gap in the current research, as scant research has been conducted in the use of ICT to support career counseling services for individuals. There is a lack of research with regard to resolving the problem of excessive career information, in particular, for training the workforce. Therefore, the aim of this study is to reveal the needs of ICT-based career information and guidance systems for the workforce through the lens of training providers. The findings of this research will enrich studies regarding the perspectives of training providers on integrating ICT into their career counseling services and provide insights for researchers and practitioners regarding the consideration of developing an online career information and guidance system to fulfill the career information needs of the workforce, which are invaluable to human development in a transition economy, as there is an increasing need for vocational training and career counseling for workers to cope with changes in the job market. A review by Roztocki and Weistroffer (2015) shows that empirical studies of wider topics that support the development of theories are imperative for ICT in transition economies.

Therefore, this article investigates the needs for the developing a Career Information Management and Guidance System (CIMGS) at workplaces, which can meet the current and emerging organizational requirements through on-the-job training and retraining. In particular, we are interested in the following three research questions (RQs):

**RQ1:** What are the user requirements of an ICT-based career information and guidance system that help career decision making in a transition economy?

**RQ2:** How should a career information management and training recommendation system be designed to facilitate such career decisions for human capital development?

**RQ3:** What is/are the personal characteristic(s) and/or environmental factor(s) affecting the establishment of such an ICT-based career information and guidance system?

To gain insight into the perspectives of training providers on using ICT to support career counseling services, we conducted a qualitative study through in-depth interviews with the training providers. From the qualitative study, we obtained the user requirements of career information management and recommendations in training courses for individuals, which are the main concerns throughout this study. In addition, the application of career guidance would be addressed through the examination of the user requirements of the training providers.

This article is developed as follows. After this introduction section, we present our literature review in the next section, followed by presenting our research methodology and data collection section. We then present our data analysis with our discussion. After discussing the limitations and the direction of future research, we conclude the paper.

## BACKGROUND AND LITERATURE REVIEW

In this section, we examine the importance of training in the perspective of organization capability, the research gap in the personalized matching of training needs, and impact of ICT to the role of career counselors in a transition economy.

### Hong Kong as a Single Transition Economy

In the past decade, Hong Kong's labor market has undergone transitional changes due to the increasing abolishment of government-owned companies. The Government has become the asset holder of these companies instead of their operator. The transition started in the late 1990s as a result of several issues, including economic recession that caused the first-ever budget deficit since the 1970s, followed by the sharp increase in unemployment rate from 2% to 8%. These two factors focused the government to provide more service online and to reduce government jobs through outsourcing, downsizing, and privatization (Ho, 2007). For example, in 2004, the Government set up the Link Real Estate Investment Trust that hived off most of the assets formerly operated by the Hong Kong Housing Authority, and thereafter wholly owned by private investors. In 2007, the Government ceased to be the public transport operator of Kowloon–Canton Railway Corporation. Apart from these privatizations, substantial outsourcing activities of the Government for public services also bring remarkable changes to the labor market in Hong Kong (Cheung, 2005). Thus, it is imperative for society to seek ways to accomplish the changes in the training needs of the labor market bought by this single transition.

### Knowledge and Organization Capability

Advanced technology accelerates and magnifies the growth of knowledge in this digital era, and proper knowledge management increases the competitiveness of organizations. Kogut and Zander (1992) defined knowledge as a combination of information (i.e., knowing the meanings of something) and know-how (i.e., knowing how to do), which can provide options to organizations in the face of changing markets. Integration of internal and external learning enables the growth of the combinative capabilities of organizations. Combinative capability refers to the capability of firms to create applications from existing knowledge. Kogut and Zander (1992) suggest that explicit and tacit knowledge acquired by internal or external learning has a significant impact on the combinative capabilities of the organizations in the business environment.

Nonaka (1994) also noted the importance of "communities of interaction" in knowledge creation and proposed the spiral of organizational knowledge. Advanced technology, such as e-learning platforms, provides a virtual learning environment that encourages knowledge sharing and creation boundlessly in society. According to Thang et al. (2010), the effectiveness of training on firm performance, including financial performance (e.g., sales and productivity) and non-financial performance (e.g., rates of labor turnover and absence), has been supported by over fifty studies.

## Human Capital and Personalized Training

Numerous studies focused on the application of e-learning have been conducted in the previous decade, however, how to match training needs based on personal characteristics and abilities may have been overlooked. Indeed, satisfying the skills needs in the organizations by offering suitable training to the workforce based on individual characteristics and abilities is utmost important to edge the organizational competencies. Zwick (2005) emphasized the significance of organizational and personal characteristics among different vocational training forms. Cardoso et al. (2012) also studied the critical factors for knowledge management in social economy organizations and reported that the knowledge-centered culture of an organization would have positive impacts on the training and training practices. To facilitate individuals' training needs, some recent studies suggest using Web 3.0 technologies to look into the personalization issues of e-learning (Kurilovas et al., 2014). More recent studies have also been conducted to use e-learning system as a tool for workplace on-the-job training (Cheng & Chen, 2015), to provide professional training in the pharmasecutical medicine and clinical research industries (Kishi et al., 2017), as well as using augmented reality to deliver the training via mobile devices (Radosavljevic, Radosavljevic, & Grgurovic, 2018).

In addition, user expectations and needs are also important in the design of a successful guidance system to facilitate vocational training. According to the requirement analysis by Höver and Steiner (2009), learners' knowledge and learning goals, particularly regarding job roles and career paths, are the most relevant items to an adaptive e-learning system in business settings. As reported in a comparative analysis of training in India and Hong Kong by Huque and Vyas (2004), the matching of training programs to trainees' requirements and their abilities has typically been overlooked by researchers. The authors further highlighted that this factor has some influence on the effectiveness of training.

## Impact of ICT on the Role of Career Counselors

Although advanced technology has changed the approaches to obtaining career information for career decision making, the role of career counselors has only minimally changed. Vocational counseling was first introduced by Parsons (1909) to assist individuals in the selection of an appropriate occupation according to their abilities and interests. Krumboltz and Thoresen (1964) interpreted the role of a counselor as helping students to explore relevant information and weighing the information with subjective judgments to achieve the most valuable outcomes for individuals. As suggested by Mallen et al. (2005), the use of online career resources and further described career guidance as services that assist clients in the investigation of their career opportunities and helps them to eliminate irrelevant information identified on the Internet. The role of career counselors is to help individuals (including students and the workforce) identify a suitable occupation that suits their abilities and interests. This process includes locating and measuring relevant career information with the assistance of technology and personal counseling services.

Advanced ICT have provided unprecedented access to massive amounts of career information. Robinson et al. (2000) examined the three major types of models that bridge the career assessment process to career information in previous decades, namely, the print-based model, Computer-assisted Career Guidance (CACG) system and Internet-based model. The authors generalized this development into three distinguishable phrases. In the early 1990s, career information was basically presented in articles, books or government publications. The popularity of computers in the late 1990s enabled a vast amount of career information to be presented in databases and was made available to users through stand-alone CACG systems, such as System of Interactive Guidance and Information Plus (SIGI PLUS) and SIGI3 (Valpar International Corporation, 2016), the DISCOVER System (American College Testing Program [ACT], 2016), the EUREKA System (EUREKA Corporation, 2016) and the FOCUS II System (Career Dimensions, Inc., 2016) (Robinson et al., 2000). Stevens and Lundbery (1998) also suggested the importance of career information management on the Internet and urged

practitioners to be prepared for technology usage. In the current decade, the delivery of career information has not been limited to the government or professional associations. Users may access career information from different information sources supported by different parties, including schools, profit or non-profit organizations. This self-administered nature of obtaining career information, however, brings the problem of overwhelming information.

In summary, there has been little research on the ICT requirements of career guidance for the needs of the workforce. In particular, studies that focus on the information need of career counselors required for assisting individuals in the identification of appropriate career information for making career decisions, such as the selection of a suitable training course, have rarely been conducted.

## METHODOLOGY AND DATA COLLECTION

In this study, a qualitative research method was adopted to explore the issues, and information was collected through semi-structured interviews. Our respondents are training providers from major training institutions, who provide on-the-job training or retraining services in Hong Kong. To select our samples for conducting the qualitative research, we used the list of post-secondary education institutions (including the two-year community colleges and four-year colleges and universities) provided by the Education Bureau (EDB) of the Hong Kong Special Administrative Region Government (HKSARG), which is the administrative bureau responsible for the formulation, development and review of educational policies and monitoring education programs in the city, and the list of training bodies from the Employees Retraining Board (ERB), which is an administrative board established under the Employees Retraining Ordinance (Cap. 423) and responsible for funding and monitoring training courses and services in the city. During the time when we conducted this study, there were eight degree-awarding higher education institutes and 101 training institutes under the charters of EDB and ERB, respectively.

In this study, invitations were sent to 13 major training institutions in Hong Kong. The selection of training institutions is in descending order by the number of training courses they offered in 2014-15. Eventually, 5 of them agreed to participate in our interviews.

Five independent interviews with six respondents were conducted. Each interview lasted between 30 and 60 minutes. At the beginning of the interview, the interviewer asked questions regarding the current training services provided and whether they had support for their service targets in making career decisions on training. Open-ended questions concerning the career information required and requirements on course selection for their target service groups were discussed. In addition, their perception of online career guidance services was captured in detail. At the end of the interviews, the participants were asked to provide some final comments on the topic without limitation on any subject discussed. The items for discussion in the interviews are presented in Table 1. The qualitative data collected from face-to-face interviews were transcribed and reviewed by the interviewees. In addition, follow-up actions through email or telephone were performed to clarify the answers or opinions of the participants where appropriate.

## DATA ANALYSIS

### Details of Qualitative Interviews

Six participants were interviewed. Although the sample size is small, the work experiences and roles in information related positions of the participants are invaluable and indispensable to this topic. All selected participants were identified as information professionals in the field of training services or career counseling services. They have been working in the field of training services provision for more than six years. As shown in Table 2, their roles at work as information specialists are highly relevant to this research.

Table 1. Summary of questionnaire contents

| The Current Practice of Career Information Provision |
| --- |
| Current career information and career guidance service(s) regarding the selection of on-the-job training or retraining programs offered by the organization or institution. |
| Distribution channel(s) of the career information and guidance service(s). |
| Obstacle(s) for individuals in the selection of suitable program(s) for their career development. |
| Obstacle(s) in the identification of relevant career information prior to course enrolment. |
| **Perceptions of Online Self-Assisted Career Information and Guidance System** |
| Opinions regarding computerized career information management and self-assisted career guidance service(s). |
| Potential information service(s) for career information management. |
| Factor(s) that influence the selection of training course(s). |
| Potential information service(s) to assist potential trainee(s) to select a suitable course. |
| Other related issues on the topic. |

All participants are responsible for manipulating and delivering career information related to the provision of training services through self-developed information management systems or other types of multimedia. As an information specialist of the organization, they are responsible for identifying the information needs of their service targets, managing course-related information in the information management systems, delivering career information and ensuring the accuracy of information dissemination. In addition to career information provisions, many participants have been engaged in the delivery of career counseling services to their service targets, such as assisting the public in the identification of the relevant career information they required, recommending suitable training courses for individuals and providing other job-related advice. Their overall work experience in career information dissemination, knowledge of career counseling service provisions, and understanding of career information needs enrich the contents of this research.

Constructivist grounded theory by Charmaz (2006) was adopted in this exploratory study to uncover potential concepts or theories grounded in the data collected from the training providers. After examining the responses from the participants, we identified four aspects for further analysis. These four aspects, including (i) the perception of the CIMGS, (ii) barriers of information seeking, (iii) factors that influence the information seeking process, and (iv) expectations regarding the CIMGS, shed light on the provision of career-related information services through the development of an ICT-based CIMGS.

## Perceptions of the CIMGS

Most respondents agreed that an ICT-based CIMGS may assist individuals in the identification of relevant career information, and the promotion of self-assisted information seeking and career guidance services is a potential solution to achieve a proper allocation of human resources under this transition economy. When talking about the perception of the CIMGS, a respondent stated that an ICT-based information platform might be useful in "directing potential students to get relevant (career) information on their own." One of the advantages of such a system is to direct users to relevant course information before further assistance is required from the counselors. Furthermore, individuals may obtain help from the system anytime, anyplace through the Internet. Plus, one of the respondents stated that:

Table 2. Case studies of management experiences of training professionals

| Subject | Background | Experiences | Current Roles | Organizations / Institutes Served |
|---|---|---|---|---|
| A | Frontline staff of higher education institution | 6 years of work experience at frontline information services | • Identifying client information needs and assists them in locating relevant information<br>• Providing recommendations regarding training courses<br>• Participating in information-related activities, e.g., education and career expositions, admission information sessions, and other course promotion activities | • Providing efficient and conducive information services to their service targets specialized in education |
| B | Managerial staff of a non-government organization | >6 years of work experience in the management of training related information | • Maintaining course-related information for the in-house information management system<br>• Working closely with internal and external stakeholders to ensure information is effectively delivered<br>• Identifying solutions to engage all parties in conjunction with the information system to meet their requests | • Supporting >800 training courses for the workforce every year |
| C | Manager of NGO (Trainee recruitment) | Extensive exposure in the trainee recruitment process | • Fulfilling information needs of trainees<br>• Responsible for career information management and dissemination to the public | • Providing training courses for a specialized industry |
| D | Manager of NGO (Career support) | A professional in providing career support services | • Providing career information to existing and potential trainees | • Providing training courses for a specialized industry |
| E | Managerial staff of higher education institute | Experiences in the implementation of E-learning; involved in the development of e-Portfolio in learning, and policy formulation for >10 years | • Working closely with academic staff, students and other support staff to disseminate information that supports the implementation and development of various learning schemes related to skill learning (i.e., critical thinking, reasoning, and effective communication) | • Providing higher education training to undergraduate and continuous education services for the workforce |
| F | Center-in-charge of NGO | Rich experience in the management and direction of a team to run a training center | • Providing day-to-day operations of training services<br>• Leading a career support team that provides career guidance services to trainees during and after the training | • Providing skill training, placement services, and career guidance to the unemployed, new arrivals and youth |

*It might be a good idea to provide (career) information in detail on the Web sites, which people can reach through mobile phones, and potential students can call the staff directly for further assistance.*

Similar to other information systems, the system should be able to incorporate additional functions to facilitate users in making career decisions following user needs. For example, an interviewee noted that:

*A system that includes course information and enables functions, such as budgeting and scheduling, would be very useful in this information society. [The key to addressing information needs is to] allow individuals to understand more about themselves, what they really need, what their abilities are and how these components can be fitted into the training courses.*

However, such acceptance of the system more or less depends on the computer literacy of the public. One of the respondents suggested that:

*[This system] might not be helpful to middle-aged individuals because of their deficiencies in computer literacy. [However, it] might be helpful for the youth.*

Another concern is the accessibility of computer devices and usage of mobile devices in low-income groups, which implies that financial constraints may be another key issue that cannot be neglected during the development of the system.

## Barriers of Information Seeking

Apart from the constraints of the development of the CIMGS, it is also important to have a good understanding of the barriers that hinder the career information seeking process. It is not surprising that the major obstacle for information seeking is that "individuals may not clearly understand what information they need." Some interviewees noted that some of their clients were unclear about what information they wanted to obtain. One of the ways to resolve this problem is to understand more about the background of the information seekers. A respondent further explained that their solution for this situation is "to assist [the information seekers] by enquiring about their backgrounds, such as educational attainment, qualifications, interests, and previous work experiences." Another issue that may hinder the development of the CIMGS is the overwhelming information in this digital world. An interviewee described this as a "burden" to information seekers. Thus, a well-designed system should be able to eliminate this burden by selecting relevant information and providing recommendations to the clients based on their backgrounds and information needs.

## Factors That Influence the Information Seeking Process

In general, the factors that influence the information seeking process can be divided into two types based on their nature: external factors and internal factors.

External factors include influences from outsiders, such as family members, teachers, and training consultants. The impact of important persons of individuals is a unique and significant factor in the process of career decision making (Kelly and Lee, 2002). In particular, the role of family has been identified as a blunt but significant factor in the career decision process (Hargrove et al., 2002). According to the comments from respondents, opinions from individuals who have similar profiles or expertise in particular fields are of great importance to information seekers, and they serve as an essential source of information. One of the respondents emphasized the role of teachers and peers by noting that "students would rather take advice from their teachers and peers than any other source." Clearly, a personal network typically serves as an important component in the information seeking process. Individuals in the network provide relevant information from their previous experiences to information seekers, which fulfills the information needs and facilitates their career decision making.

Some organizations make use of personal networks, such as educators, coaches, and peers, to spread training information to their service targets. One respondent suggested that information seekers "rely on our student helpers to give advice," and relevant learning experiences from peers "may help the newcomers to make their choices." Other respondents choose to deliver career information through a more formal channel, such as consultation and hotline services. They described "promotion through the networks by training consultants and training providers (as) the most popular ways to deliver career information." However, there is also one additional informal channel that may affect the information seeking process. One of the respondents indicated that opinions from family members play "an important role in the selection process [of training courses]." Although family members are often not information experts of a particular field, they typically have the best knowledge regarding the information seekers' background, which make them suitable individuals to assist information seekers in identifying their vocation needs.

Internal factors comprised an individual's personal characteristics (such as personalities, demographic factors, education attainment, and skills acquired) and preferences. These preferences often depend on non-conscious processing that the basis of evidence and reasoning has not been

followed. Krieshok et al. (2009) argue that this intuitive mechanism should also be included in the model of career decision making. Similar to external factors, these factors commonly function as basic information requirements for placement officers and training consultants in recommending relevant career information and offering appropriate career guidance services to information seekers. An interviewee suggested that "a personalized system can be attained by considering personal factors, such as personalities, qualifications, and work experiences." A similar viewpoint was shared by another individual who suggested that the "factors may include one's preferences, personalities, abilities, ages, and family backgrounds." A respondent further strengthened this view by noting their staff will "help them [the service targets] to make their choices [on training courses] based on their backgrounds and preferences." Of all factors, personality appears to be the most popular factor identified by the respondents. A respondent explicitly stated that "personalities may affect [information seekers'] choices in training courses."

Aside from personalities and preferences, several physical constraints are also considered factors that influence the information seeking process. One of the respondents stated "apart from their preferences, individuals' physical situation and abilities (such as proficiency in Mathematics or English) also influence their selection in training courses." The physical constraints that influence career choices also include the personal background and income level of the information seekers. An interviewee noted that:

*[The] younger generation may prefer using websites and mobile devices, whereas senior citizens may feel more comfortable in obtaining information from printed copies, such as course prospectus, newspapers, and leaflets.*

Another individual commented that "individuals with comparatively low education attainment from the low-income group" exhibited more concern regarding the course fee in the selection of a training course. In addition, some respondents expressed that during the information seeking process, there may be a relationship between the information seekers' intentions of getting help and their level of knowledge of the targeted subject. A respondent suggested that "trainees who seek information in the field in which they have work experiences may request less assistance regarding career guidance."

When discussing the information-seeking process of insiders with another respondent, the interviewee stated that "whenever potential students (insiders of a particular field) approach us through hotlines, they typically have clear goals and objectives in their studies or careers." Therefore, it is a typical practice for some organizations to present different sets of information based on the knowledge of the information seekers in a particular field.

## Expectations Regarding the CIMGS

In view of the user requirements and expectations for the CIMGS, opinions from the respondents can be divided into three areas, namely, information requirements, functional requirements, and medium for information delivery.

In general, the information requirements of the CIMGS should cover both job-related and training-related information. Job-related information includes job vacancies from the companies and news from industries, which should be "pragmatic, attractive, and up-to-date" and may serve as an appetizer to induce great interest regarding various industries. However, the role of information is not only limited to providing references but also acts as a medium to educate the public. One of the interviewees stressed that "the aim of providing career information is not only to foster our training services but also to propagate knowledge regarding the construction industry to the public." For information regarding training, the respondents commented that the objectives of the training, course contents, entry requirements, application methods, career ladders, and job prospects of the field are essential for information seekers. Comments from the respondents indicated that:

*The most important piece of information in directing them to suitable disciplines may be the descriptions of training targets, course contents, and career ladders. The most important factor is the job prospects, such as the sustainability of a specific job type.*

A respondent stated that one of "the most common inquiries is the prospects of different types of jobs." Following the identification of a list of suitable courses, career information should be provided based on the selected courses. Another respondent commented that "supplementary information, such as entry requirements, courses contents, job prospects, and everything that may be required during the training, should be attached." Evidently, these details should be further linked or attached to the recommended information for users. In addition to the training related information, placement information should also be provided. A respondent stated that "the most important information to our service target is the employment information, such as job vacancies in the market." This system would be useful if it can further match this information to the group of trainees according to the industries they have worked in. In addition to information provision, a respondent highlighted that "effective communication plays an important role in career guidance services," which suggested another challenge regarding the design of the system for the use of internal stakeholders.

For system features, a key function of the CIMGS is to enable automatic selection of career information that suits the users' needs. A respondent suggested that "a more personalized system design" should be presented to "facilitate [the information seeking process] by considering other personal factors, such as the locations they lived, their preferences, personalities, and work experiences." One potential approach to achieve this goal is to consider the personal factors of the users, including the information seekers' preferences, as well as the physical constraints, such as education attainments, work experiences, and residence locations, in the construction of individual portfolios. Apart from personal characteristics, the system may further consider the individual's personality, personal values, and beliefs during the selection stage. To better understand the information seekers, a respondent suggested that an aptitude test should be included to measure these extrinsic factors. This test can help potential trainees understand themselves, and the system may recommend training courses suitable for them based on the test results. However, another respondent suggests that:

*Further study on how to make use of the course details, such as the entry requirements, learning outcomes, and modes of study, to assist potential trainees in screening out suitable courses at an early stage (in the course selection process appears to be necessary at this point).*

The respondent further commented that:

*The most important remark for this system is to allow individuals to understand more about themselves, what they really need, what their abilities are and how these components can be fitted into the training courses.*

Furthermore, several pragmatic ideas regarding the CIMGS suggested by the respondents include budgeting and scheduling functions, as well as alumni sharing in the form of text and videos for newcomers and job matching services. Specifically, they suggested that job-matching services should accompany with the curriculum vitae created by users.

As for communication channels, career information and guidance services should be delivered through media that have been widely used by most individuals in society, such as websites and mobile devices. Most respondents noted that there is an increasing trend of mobile device usage, especially mobile apps. An interviewee stated that "it might be a good idea to provide [career] information in detail on the websites, from which individuals can research through a mobile phone." A respondent believed that "the development of course information related platforms based on mobile devices

would be the trend of the training services in this information era in view of the high penetration of mobile devices and rapid development of mobile apps." It is noted that there is an increasing trend of mobile device use, which enables an increasingly greater number of individuals to access the Internet. In particular, a respondent suggested that they found "WhatsApp to be very useful to their services [to clients]," which implies the incorporation of different, commonly used platforms is necessary for the system. A summary of the responses is presented in Table 3.

## DISCUSSION

### Objectives and Requirements of the CIMGS

The CIMGS is the recognition that the use of ICT can better serve an individual's career or training information needs by providing guidance based on personal characteristics, abilities, and work experiences. In view of the perceptions and expectations of the training providers in a transition economy, we summarize their ideas and suggest that this system should able to provide the following functionalities:

- To direct the users to identify the career and training information they want;
- To provide relevant and up-to-date career and training information based on user portfolios;
- To recommend relevant career and training information to users with reference to industrial insiders and the experiences of other users, such as alumni;
- To assist users in understanding themselves, especially their potentials in this transition economy;
- To take into consideration the involvement and collaboration of related stakeholders, such as family members, peers, trainers, industrial insiders, and counselors;
- To present a user-friendly web-based form and be workable on common mobile devices;
- To facilitate users in budgeting and scheduling their career and study path.

The CIMGS is a tool for career information retrieval and training recommendations, which supports individuals in making their career or training decisions. The recognition of information needs through recommending suitable and relevant career information and training courses can offer benefits to individuals as a personalized career planning tool for catering the labor market changes in the transition economy. To facilitate positive changes in the labor market, it should reflect an individual's vocation needs, enable user-friendly career information retrieval, encourage collaborations among stakeholders, and allow the prioritization of training information for users. With respect to the provision of training services, this system offers an additional means for users to career planning, in particular, training. Furthermore, under the proposed framework, the CIMGS also considers external factors for the recommendation of relevant career and training information.

### Factors Affecting the Information Seeking Process for Career or Training Decisions

Information seeking behavior of individuals differs according to their degrees of subject knowledge. A longitudinal study of career information workers by Kuhlthau (1999) demonstrated that work experience has an impact on the information search process, which suggested that the abilities of information seeking of professionals were enhanced with their increasing experience at work. Plus, Saito and Miwa (2001) noted that there was a significant difference between novices and experts in terms of their information seeking abilities through the measurement of the solution time and pages searched and accessed in an experimental study. In response to the findings of the qualitative survey, we suggest that further analysis regarding the impact of the subject knowledge should be conducted to further explore this issue.

Although the perceptions of the CIMGS from the respondents were positive, the acceptance level of information seekers from different age groups and levels of affordability were the major

**Table 3. Summary of key comments from the respondents**

| Issue Concerned | Key Comments |
|---|---|
| Perceptions of the CIMGS | • The system has the potential to "direct potential students to get relevant (career) information on their own." <br> • "It might be a good idea to provide (career) information in detail on the Web sites, which people can reach through mobile phones, and potential students can call the staff directly for further assistance." <br> • "A system that includes course information and enables functions, such as budgeting and scheduling, would be very useful in this information society. [The key to addressing information needs is to] allow individuals to understand more about themselves, what they really need, what their abilities are and how these components can be fitted into the training courses." <br> • "[This system] might not be helpful to middle-aged individuals because of their deficiencies in computer literacy. [However, it] might be helpful for the youth." |
| Barriers of information seeking | • "Individuals may not clearly understand what information they need." <br> • One of the solutions for this situation is "to assist [the information seekers] by enquiring about their background, such as educational attainment, qualifications, interests or previous work experiences." The overwhelming information as a "burden" to information seekers. |
| Factors that influence the information seeking process | External factors <br> • "Students would rather take advice from their teachers and peers than any other source." <br> • Information seekers "rely on our student helpers to give advice." <br> • Relevant learning experiences from peers "may help the newcomers to make their choices." <br> • "Promotion through the networks by training consultants and training providers (as) the most popular ways to deliver career information." <br> • Opinions from family members play "an important role in the selection process [of training courses]." <br> Internal factors <br> • "A personalized system can be attained by considering personal factors, such as personalities, qualifications, and work experiences." <br> • "Factors may include one's preferences, personalities, abilities, ages, and family backgrounds." <br> • Staff will "help them [the service targets] to make their choices [on training courses] based on their backgrounds and preferences." <br> • "Personalities may affect [information seekers'] choices in training courses." <br> • "Apart from their preferences, individuals' physical situations and abilities (such as proficiency in Mathematics or English) also influence their selections in training courses." <br> • "[The] younger generation may prefer using Web sites and mobile devices, whereas senior citizens may feel more comfortable in obtaining the information from printed copies, such as course prospectus, newspapers, and leaflets." <br> • "Individuals with comparatively low education attainment from the low-income group" exhibited more concern regarding the course fee. "Trainees who seek information in the field in which they have work experiences may request less assistance regarding career guidance." <br> • "Whenever potential students (insiders of a particular field) approach us through hotlines, they typically have clear goals and objectives in their studies or careers." |
| Expectations regarding the CIMGS | • Job-related information should be "pragmatic, attractive and up-to-date." <br> • "The aim of providing career information is not only to foster our training services but also to propagate knowledge regarding the construction industry to the public." <br> • "The most important piece of information in directing them to suitable disciplines may be the descriptions of training targets, course contents and career ladders. The most important factor is the job prospects, such as the sustainability of a specific job type." <br> • "The most common inquiries are the job prospects of different types of jobs." <br> • "Supplementary information, such as entry requirements, courses contents, job prospects and everything that may be required during the training, should be attached." <br> • "The most important information to our service target is the employment information, such as job vacancies in the market." <br> • "Effective communication plays an important role in career guidance services." <br> • "A more personalized system design" should be presented to "facilitate [the information seeking process] by considering other personal factors, such as the locations they lived, their preferences, personalities, and work experiences." <br> • "Further study on how to make use of the course details, such as the entry requirements, learning outcomes, and modes of study, to assist potential trainees in screening out suitable courses at an early stage (in the course selection process appears to be necessary at this point)." <br> • "The most important remark for this system is to allow individuals to understand more about themselves, what they really need, what their abilities are and how these components can be fitted into the training courses." <br> • "It might be a good idea to provide (career) information in detail on the websites, which individuals can research through a mobile phone." <br> • "The development of course information related platforms based on mobile devices would be the trend of the training services in this information era in view of the high penetration of mobile devices and rapid development of mobile applications." <br> • "WhatsApp to be very useful to their services [to clients]" |

concerns of the information service providers. Recently, Mills et al. (2014) demonstrated significant differences in information seeking on the Internet in different age groups. Plus, Yan (2010) suggested that only a small proportion of online health information surfers were greater than 50 years of age. Age influences the acceptance of information communication technology (Vroman et al., 2015). Furthermore, the accessibility of computers and mobile devices also influences information seekers in the identification of information through the Internet. This physical constraint could be one of the major concerns for low-income groups. Takahashi et al. (2011) concluded that older generations and individuals from lower income groups tend to have a lower usage of online health information through mobile devices. In view of these concerns, further responses from the workforce perspective should be collected to investigate this issue.

According to the qualitative survey results, individuals around the information seekers, such as family members, teachers, peers, and alumni, were identified as influential in the information seeking processes; however, evidence in support of this argument has rarely been demonstrated. In contrast, Takahashi et al. (2011) demonstrated that communications with professionals, family members, or peers are not common among health information seekers in Japan. However, this irregularity may represent an opportunity because the derivation and usefulness of the opinions from these mediators have not been demonstrated. Thus, further investigation of the collaborations among different stakeholders related to an individual's learning plan on an ICT platform is imperative in the future.

To sum up, based on the qualitative analysis presented, we identified four issues, which require further investigation, and probably through a quantitative survey. The following represents the unproven rules for information seeking in the field of training services, which were derived from the findings of the qualitative survey:

**Issue 1:** How does user knowledge regarding the field influences the information seeking process?
**Issue 2:** How does age affects the choice of approaches that individuals seek information?
**Issue 3:** How does user income levels influence choices in the selection of training courses?
**Issue 4:** How do family members, peers, teachers, insiders, experts in the industries, and individuals who have studied the same courses affect the career decisions of users?

## LIMITATIONS AND FUTURE RESEARCH

This study has several limitations, which implies a need for further research. First, although the respondents of this study originated from a limited number of sizeable training institutions, minority industries might not be represented. Training providers that specialized in specific industries may not have been taken into account because of the time and resource constraints of this research. Thus, similar studies in the future may consider the investigation of industries in specific domains. In a broader view, the data collected in Hong Kong may be biased in contrast to stakeholders in other countries. For example, cultural differences may affect the results of similar research in countries other than Hong Kong in the same settings as prior research has already reported the cultural impact on knowledge management (Ardichvili et al., 2006). Therefore, comparative studies that include other countries may be valuable in this area of research. As the integration of ICT in training services in the workplace has become indispensable to daily life, this area of research is becoming more and more important to various industries. In view of the importance and influence of advanced technology, studies regarding information seeking behavior with the integration of advanced technology may be of great significance to this research area.

In the current decade, the number of studies regarding information privacy has increased because of the growing public concerns regarding the collection, use, and transfer of personal information online. Besides, when increasingly greater amounts of personal information must be incorporated in information systems, public concerns regarding data protection and privacy arouse. Followed by the ease of use and compatibility, the perception of trustworthiness is another significant factor for citizens

to determine whether they will use electronic public services (Carter and Bélanger, 2005). Therefore, guidelines and restrictions regarding the protection of personal information and data privacy should be assembled during the development of information systems. Here, we further emphasized that public concerns regarding information privacy and security have resulted in research in other related fields, such as e-commerce and public administration. In response to this issue, some researchers now attempt to understand or even seek ways to minimize the information privacy concerns of users (Arpaci et al., 2015; Hann et al., 2007). By focusing on concerns from different stakeholders, diversification of focus in this research area sheds light on future studies (Reddy and Venter, 2010). Plus, as suggested by the prior literature (Agudo-Peregrina et al., 2014), the behavioral intention and adoption behavior of e-learning system of learners of higher education and lifelong learning learner would be different. Therefore, researchers should also look into this type of impacts on the adoption of the CIMGS.

## CONCLUSION

In this article, we have detailed our findings on how ICT can contribute to vocational counseling through the requirements elicited from our respondents, which has an increasing demand for human capital development in this transition economy. Clearly, an ICT-based CIMGS that assists individuals in the identification of relevant career information and provides career counseling services is one of the solutions for the overwhelming amount of information. Other than self-activating career and training information selection and recommendation, the design of the system must incorporate functions that can assist individuals in the formulation and organization of their own career paths, as well as training plans to cope with such economy change. Given the diversity of career-related activities, planning tools that can help users to schedule and budget for their training are essential. Furthermore, opinions from other individuals are also critical pieces of information, which help individuals to make their career decisions. Although there is no evidence regarding the usefulness and effectiveness of opinions from different sources, regardless of the source, opinions are indispensable to the design of the system. Specifically, human networking with domain experts may serve a significant role in assisting individuals, whereas information specialists may contribute to users through the provision of training services and support in information retrieval.

The admission selection process is of great importance for most of the education fields to ensure the cost-effectiveness of the training services provided. In this study, evidence indicates the importance of antecedents that affect the employee career information-seeking process. Many studies have demonstrated that prior knowledge, personality, communication skills, and demographic characteristics can be treated as predictors of training outcomes. For example, Helle et al. (2010) suggested that student performance in a pathology course is affected by personality factors and prior knowledge. Mercer and Puddey (2011) also suggested that student performances were positively affected by their previous academic achievements, communication skills, and gender, while Mercer et al. (2013) also suggested previous academic achievement and gender are predictors of an undergraduate course in dental science. However, these studies focus just on selection criteria for medical education of undergraduates, whereas investigations in the field of training for the workforce have rarely been conducted. Thus, further studies, which focus on investigating the information needs of vocational training from the perspective of the workforce should be conducted, in particular, with increasing needs under the current globalized knowledge economy. On the other hand, we are planning to study the experience of public libraries in the U.S. in providing job information and vocation training to the public (Lo, Cho, & Chiu, 2017).

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