Technology-Infused Career and Life Planning Education

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Abstract: The purpose of this study is to demonstrate how commonly available technological devices can be used to promote the development of career and life planning education practices. The use of technology to enhance career decision making processes has long been documented in career counseling literature; with the advent of the fourth industrial revolution, the use of technologies such as Artificial Intelligence (AI) has become increasingly prominent. However, the use of advanced technology is costly, so it is argued here that it is entirely feasible for career guidance teachers to use existing technology in sustainable and economical ways for the purpose of organizing and disseminating career information. This paper illustrates how, even within a limited financial budget and with staff untrained in technology, schools, colleges, and universities can utilize affordable technology to enhance students' career path exploration.

Introduction

Technological advancement has led to the creation of today's knowledge-based society—but such advancement does not come without a cost. New technologies tend to disrupt established practices in every sector and level of many societies. In particular, there has been a significant effect on the nature and quantity of employment opportunities available to school leavers. One recommendation from the United Nations is that by the year 2030, we need to substantially increase the number of persons who have relevant technical and vocational skills for employment and entrepreneurship (UNESCO, 2018).

However, within the school system, there remains an embarrassing problem that too few students receive adequate career information for planning a career path (OECD, 2004; Watts, 2013). This paper describes an endeavor designed by the first author while he served as a career guidance teacher in a Jesuit secondary school in Hong Kong during the 2016/17 academic year. In order to address this issue, he used affordable technology to enhance the quality and dissemination of career information to students. The paper also calls for career counselor education programs to equip their graduates with technological skills to organize career information in a way that facilitates students' career decision making.

Role of Technology in Career Guidance and Counselling Practices

Theorists in the domain of career guidance have acknowledged the role that technological advancement plays in changing career counseling practices (Hirschi, 2018; Sampson, Kolodinsky, & Greeno, 1997; Sampson & Krumboltz, 1991). During the decades from 1960 to 1990, video and audio technologies (CDs and television) remained the dominant forms of technology used for arousing students' interest and disseminating career counseling information (Stevens & Lundberg, 1998); but by the 1970s researchers were exploring the impact of incorporating other forms of emerging technology into the counseling process (Waltz, 1970). Waltz (1970) also warned counselors that technology could bring both positive and negative effects, with one possible effect being the dehumanization of

counseling as a caring profession. Researchers had already begun to worry that the high speed of societal change had created difficulties for counselors in keeping track of the latest developments in the labor market (Hoyt & Hughey, 1997; Stevens & Lundberg, 1998).

Development of career counseling practices took a dramatic turn when the Internet emerged in the 1990s. This directly threatened the existence of counselors as the sole source of career information, because the Internet allowed proliferation of career-related websites and easy access to online counseling services (Boer, 2000). However, the ethical standards, the therapeutic effects, and the professionalism of online services were unknown (Richards & Vigano, 2013) and there was little evidence to prove how the services could be used meaningfully for career development (Koonce, 1997). The sudden emergence of online services began to challenge career counseling as a person-to-person discipline, as schools and universities might not see the need for a qualified professional career counselor (Savickas, 2003). In response to the challenge, experts in the field have already called for career counselors to adapt to the realities of the contemporary world and embed the use of technology in their daily work (Anthony, 2015; Leung, 2002; Leung, 2005; Leung, Chan, & Leahy, 2007; Savickas, 2003).

Using Technology to Manage Career Information

The provision of current career information, and students' easy access to it, is critical to any career guidance program (OECD, 2004). In today's volatile labor market, it has become increasingly important that counselors be able to keep pace with changes in the requirements and opportunities available in the world of work (Bolles, 2015, Hoyt & Hughey, 1997; McCarthy, Moller, & Beard, 2003). Online websites, computer software, and web applications all represent potential resources for the management and dissemination of career information (Johnson & Elkstrom,

1984; OECD, 2004; Sabella, Poynton, & Isaacs, 2010). The use of computer technology can help career counselors overcome many difficulties concerning the management of career information without having to invest large sums of money (Samspon, Kolodinsky, & Greeno, 1997). Career counselors in secondary schools should therefore learn to use software to compile career information in a form that is readily available for access by students, and use networking technologies such as Internet and intranet to disseminate information (Hohenshil, 2000; Sabella, 2000). Students today are well accustomed to using such technologies (Prensky, 2001).

A step in the right direction would be to ensure that pre-service and in-service teacher education programs include adequate coverage of using technology in daily practices in schools, including in the delivery of career information (Herro, 2015; Katyal, 2010; Lawless & Pellegrino, 2007; Stone & Turba, 1999).

Factors in Hong Kong that have Hindered Adoption of Technology for Career Guidance

The adoption of technology in Hong Kong classrooms has been very limited to date, due mainly to deep-rooted indigenous beliefs about education that are biased towards 'book learning' and examination results. Instruction in classrooms within this culture is still very teacher-centered and examination-driven, with frequent use of rote learning and memorization of curriculum content (Urmston, 2003; Wong, 2017b). Under this culture, using technology to teach and provide a service is regarded as a very "non-traditional" strategy, so it is not actively encouraged (Katyal, 2010; Urmston, 2003; Wong & Li, 2006).

Teachers also believe that it is only senior members of the school staff who have the power to determine how teaching must take place, so there is little incentive for individual teachers to show initiative by introducing something new (Fox & Henri, 2005; Kwo, 2000; Urmston, 2003, Wong,

2017a). Because of this, even teachers who are competent in using technology feel that they cannot make an independent decision to introduce it for learning (Fox & Henri, 2005). Many teachers have thus become very passive in their role and reluctant to innovate (Fox & Henri, 2005; Legislative Council, 2016).

These factors have also influenced the slow rate of technology infusion into career guidance in Hong Kong. A territory-wide study by Federation of Youth Groups (2019) provided evidence of the poor standard in career services of the 103 secondary schools surveyed in 2018, with many teachers and students expressing doubt about the effectiveness of their schools' career guidance program. Despite a reform in career guidance, launched by the Education Bureau in 2014 and with heavy investment recently from the government, many career guidance teachers still lack the confidence and knowledge for conducting career assessment and counseling processes (CLAP for Youth, 2017). Most teachers seem not to have recognized the potential value of utilizing basic technology as an aid to delivering career guidance. Also, teachers frequently misconstrued academic advising and career guidance as synonymous with each other (Fox & Henri, 2005, Wong, 2018).

It could also be said that conceptualization and delivery of career services in Hong Kong schools have not kept pace with developments in many other parts of the world (Leung, 2002; Leung, Chan & Leahy, 2007; Williams, 1973; Wong & Yuen, 2019).

Slow Development of Career Guidance in Hong Kong

There is little incentive for schools in Hong Kong to meet quality benchmarks in the career services they provide, because such provision is not a legal obligation of schools. This is unlike the situation in similar geographical locations, such as Taiwan. The flexibility permitted to schools in Hong Kong under the school-based management policy means that any 'recommendations' from the Education Bureau can be ignored by schools that wish to do so, because schools have the power to make their own decisions over implementation (Hui & Cheung, 2006). The Education Bureau recommends that, to some degree, career guidance should be performed by classroom teachers themselves, because they know and understand their students best (Hong Kong Association of Careers Masters & Guidance Masters, 2014). Naturally, this would be supplemented by input from career education teachers and counselors. But, the power granted to schools under the school-based management policy has meant that many schools have ignored this recommendation and are instead relying on external organizations to provide career guidance work (Wong, 2017a; Yuen et al., 2018).

There are many possible reasons for this situation. The examination-driven teaching culture, plus a deeply ingrained belief among parents in Hong Kong that graduation from a university is the only socially respectable path, has led to career guidance often being ignored (Education Bureau, 2019; Gatsby Charitable Foundation, 2014; Williams, 1973). The high prestige awarded to academic study has resulted in guidance practices in secondary schools being solely focused on academic advising and support, rather than attending to students' longer-term vocational aspirations.

Under the examination-driven teaching culture described above, career-related learning activities are regarded by teachers and parents as 'time-wasting' activities because they reduce the time available for academic preparation (Gatsby Charitable Foundation, 2014; Williams, 1973). Consequently, it is common for teachers to see career guidance as an unimportant duty that interferes with their 'real' work (Leung, 2002; Williams, 1973; Wong, 2018) and there is little motivation to invest their efforts, or to try to innovate, in this area (Gysbers, 2000; Wong & Yuen, 2019). This also explains why it is common to see the career service in Hong Kong secondary schools led by a teacher who favors a minimalistic approach, involving

only clerical work and information dissemination (Williams, 1973; Yuen et al., 2018).

It is also acknowledged that school teachers in Hong Kong tend to lack personal knowledge and experience of the world of work, having passed directly from university to teaching, without spending time in other employment (Federation of Youth Groups, 2019; Wong & Yuen, 2019). This means that most teachers cannot adequately advise students as they possess limited knowledge about the employment market. They lack confidence in participating actively in career guidance, and often merely serve as an agent, referring their students to members of the alumni for career advice, because they feel unable to offer it themselves. In addition, the emergent style of "overparenting" or "helicopter parenting" of many Hong Kong parents would just provide additional obstacles for adolescents in Hong Kong to follow their teachers' guidance (Leung & Shek, 2018). This is because parents are increasingly exerting control and direct influence on their children even when they have reached adulthood (Doepke & Zilibotti, 2019; Zhang, Yuen, & Chen, 2015). For example, Hong Kong parents would exert influence when their children opt to pursue a further education that is regarded as socially undesirable (e.g. vocational education) (Gatsby Charitable Foundation, 2014), or an occupational choice that does not lead to a white-collar job perceived by the parents as high paying, stable and socially respectable (e.g. accountant, civil servant, physiotherapists) (The Education University of Hong Kong, 2017).

Another obstacle is that career guidance is not an area of expertise that is appraised as part of teachers' assessment for promotion. As suggested by Shih (1999), the Confucian influence of the importance of "教書" (translated as "teaching the book" in English), means that the appraisal of teachers is based on their effectiveness in 'teaching the book' … and on the examination performance of their students, not upon counselling of students (McClelland, 1992; Williams, 1973;

Wong, 2017b). In many Hong Kong secondary schools, the personal and individual counseling element in career guidance work is usually neglected (Education Bureau, 2019).

In response to these various obstacles and hinderances, several reform initiatives have been introduced. These have, however, often met with resistance from teachers and have not achieved their intended purposes (Fung, 2000; Poon & Wong, 2007; Tam, 2013). A large-scale survey conducted by Cheung and Wong (2012) revealed that resistance was mainly caused by teachers' lack of understanding of the reform, reluctance to change, and a lack of (or misallocation of) resources. In a large-scale survey conducted by Ho and Leung (2016) it was found that the grant awarded to schools for career work had not been used for enhancing career services but for other purposes such as hiring more teachers for academic teaching. The negative effects of undermining the importance of career guidance are now beginning to show. Following the announcement of the QS 2020 university ranking, Ben Sowter, QS director of research, cautioned about Hong Kong students' employability. He urged universities within the territory to help students improve problem solving skills, proper work attitude, and interpersonal skills so that they can compete in the contemporary job market (Oriental Daily, 2019; South China Morning Post, 2019). In addition, given the fact that English is the dominant international language of business, researchers have also cautioned that secondary English language education, and the job readiness of students at large in Hong Kong have to be strengthened in order to maintain Hong Kong's long-term competitiveness (Financial Times, 2015; The Economist Intelligence Unit, 2018; United Nations, 2019); World Economic Forum, 2016).

Using Technology to Disseminate Career Information

Career counselors can use readily-available technology creatively to provide accurate information, increase students' motivation, and enhance the counseling experience. This may include web-based applications such as: email, web pages, chat rooms, video conferencing, instant messaging and free online tools such as: Google Sheets, OpenOffice, and commercial desktop applications such as: *Microsoft Word*, *Microsoft PowerPoint*, *Microsoft Excel* to construct and display database systems (Beidoglu, Dincyurek, & Akintug, 2015; Grosshandler, 2012).

In the following sections, two cases are presented to show how readily accessible technology can be used innovatively to enhance career guidance. First we look at how popular desktop applications such as *Microsoft Excel* can be used to organize and compile career information. Then, in the second section, the authors show how teachers can use online platforms to easily create a website for the dissemination of organized career information.

Case 1: Using Spreadsheet Software to Compile Career Information

Spreadsheet software can be used effectively as it can reorganize and adapt career information according to contextual needs. In this example, *Microsoft Excel* (Excel) is used as it is accepted by referred journals as an accurate statistical analysis tool (Hadley, 2014).

In Hong Kong, information on further study opportunities for school leavers is issued by (i) education providers (universities and vocational institutes), (ii) government commissioned professional teachers' association (e.g., Hong Kong Association of Careers Masters and Guidance Masters), (iii) Non-government organizations (NGOs), and (iv) the Joint University Programmes Admission System (JUPAS). Every year,

these organizations invite career guidance teachers to attend seminars to equip them with current university admission scores and the various further studies pathways. This is usually given out as a package of information organized according to criteria of that particular body. The problem is that the information cannot be compared easily because, for example, admission scores are organized according to the names or course codes of the academic programs. This method of organization can be improved if the information is referenced according to students' actual needs and interests when searching and making a career path decision. The literature on career guidance suggests that a student's personal interest is (and should be) of paramount importance when making decisions on future studies or employment (Education Bureau, 2014a, 2014b; Leung, 2005). An interest-driven approach is one of the main objectives in the *Learning to Learn 2.0* curriculum in Hong Kong, to help students identify their future career path (Curriculum Development Council, 2015).

In Hong Kong, every tertiary institution selects students differently by using different admission calculation formulas. Each university has the freedom to set whatever criteria they deem suitable for admission into a particular academic program. This means that when students want to choose a program that caters to a particular career path aspiration, they will spend a large amount of time trying to compare admission standards across programs. It is suggested here that career information of this type should be organized in a uniform way that can facilitate career decision making, and at the same time enhance information comparability across institutions and agencies.

The example here illustrates how *Excel* can be used to produce an information package. The career information is reorganized in a way to enhance interest-driven career decision making.

Figure 1. A snapshot of degree programs under one academic specialization

ACCOUNTANCY

Funding mode	JUPAS code	Program name	Lower quartile admission score of the previous year	Interview needed?	Additional requirements / Notes
JUPAS UGC Funded	js4240	CUHK - Professional Accountancy	26	On a selective basis	English at Level 4
JUPAS UGC Funded	js6781	HKU - Bachelor of Business Administration in Accounting and Finance	26	On a selective basis	English at Level 4.
JUPAS UGC Funded	js5318	UST - BBA Professional Accounting	24	On a selective basis	Level 4 in English
JUPAS UGC Funded	js3466	Poly U - BBA (Hons) in Accounting & Finance	23.2	May require	
JUPAS UGC Funded	js3911	Poly U - BBA (Hons) in Accountancy	23.2	May require	

This format supports an interest driven approach by regrouping data according to students' main subject interest, in this case accountancy. The academic programs and their relevant admission scores can be grouped under areas of academic specialization rather than by JUPAS scores (Figure 1). In terms of establishing comparability of information, raw admission scores published by JUPAS (2016) were extracted directly from the source file. The raw scores were published by the central governing university admission agency, so validity and reliability of the data was assured. The final finished product contained 24 pages of admission information sorted according to 13 different subject specializations and was disseminated to parents, teachers, and administrators of the school.

Case 2: Using Web Applications to Disseminate Career Information

Free online website creation platforms can be used to create websites for organizing and disseminating career information. This case illustrates that Internet technology today has advanced to a point where even users without computer programming expertise can create professionally designed websites. In this informational age, knowing how to use Internet technologies is essential for career counselors as an effective method of managing and delivering career information (Sampson, 1991; OECD, 2004; Watts, 2013). A critical factor affecting teachers' adoption of technology into their daily routines is the perceived ease of use (Hu, Clark, & Ma, 2003; Yuen & Ma, 2003, 2008). When internet technologies first emerged, website creation was a very difficult task for many teachers (Chan, 2002). Now, it is much easier, using free online website creation platforms

such as *Weebly*, *Wix.com*, and *Wordpress.com*. The overarching similarity offered by these services is that a simple widget-based system can be applied to create and host websites at no cost. Another advantage is that they can be launched within a web browser and no third-party program installation is needed.

In the case presented here, a website was created by the first author using *Weebly*, a free online website creation platform. Similar to other platforms, users can use a simple widget-based system to build websites without the need of any prior knowledge of computer programming. The design of the website catered to the developmental needs of students. In this respect, to help enhance students' self-awareness, links to both formal and informal online career assessment tools could be found under the "Life Planning" tab (Figure 2). In particular, users could gain information about internal career development workshops. For example, in the "Reading materials" section, links to research reports and newspaper articles were updated regularly to help learners understand developments in the world of work.

Figure 2. Screenshot of the "Life Planning" tab
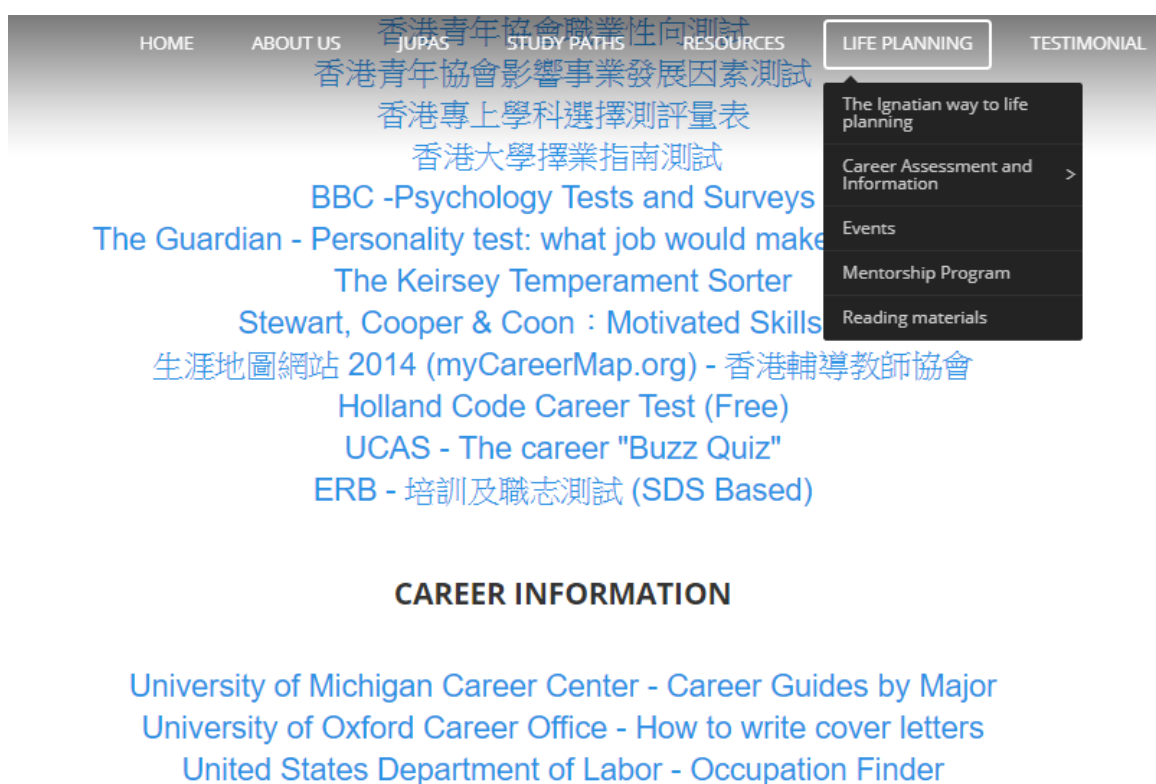
In order to facilitate career decision making, a special feature of the website was university admission information, past university admission statistics, admission score calculation, and public examination performance statistics. All of which could be found under the "JUPAS" tab (Fig 3). The term JUPAS refers to the full name of the centralized university admission protocol: *Joint University Programmes Admissions System*. By presenting these different sources of information together on the same page, students can make a better-informed career decision in a time-efficient manner, as the above information originally was scattered across various websites.

Figure 3. Screenshot of the "JUPAS" tab
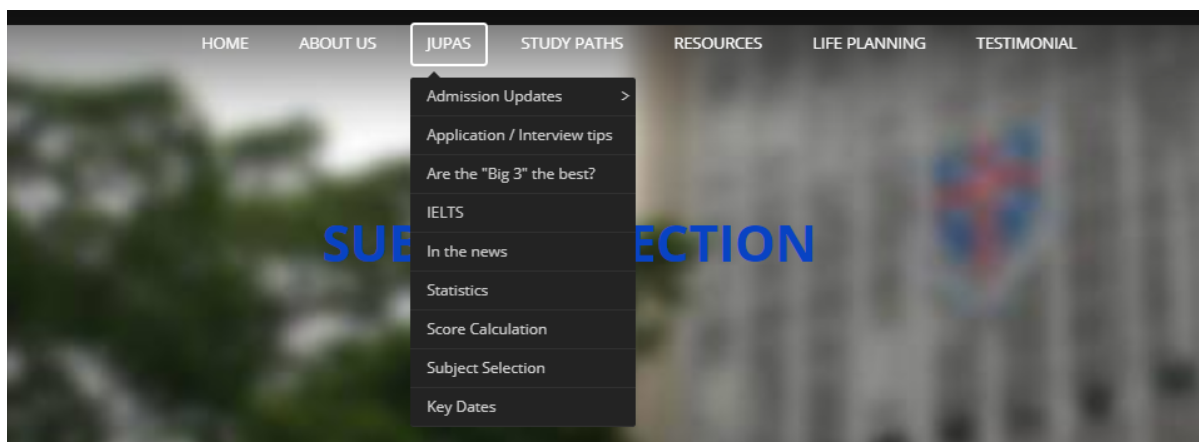
Some points to note about subject selection

There are two major factors that influence your choice, which are 1) Your interest and 2) Your actual DSE score. If your DSE score outperforms the entrance requirements of your most desired program, it would then be the best situation. However, the performance of students of each year is different, if it was a good year (many students doing well), it would be possible that that year would be a "more difficult year" for one to get into his / her desired undergraduate programme.

To know the overall performance of all candidates of one particular year, we can check the statistics about 1) General performance in the best 5 subjects and 2) General performance in relation to university admission published by the HKEAA. These statistics can be found on our webpage under JUPAS > Statistics.

In summary, the website served as a one-stop solution, enabling students to make informed career decisions in a more efficient and timely manner. This is crucial for the success of any career guidance program. The design of the website also allowed users to conduct their own career exploration and, at the same time, become knowledgeable about the labor market.

Summary and Implication for Future Practice

The authors have shown how school counselors and career guidance teachers can incorporate everyday technology into their practices within a secondary school setting in Hong Kong. They have suggested how spreadsheet software and web-based website creation can be used to enhance the organization and effectiveness of career information dissemination. The paper pinpoints the importance of establishing comparability of career information across institutions and programs, and then disseminating it in a way that facilitates career exploration based on interest. Only a limited number of software and web applications were discussed in the paper, and the use of other computer applications in the career guidance process needs to be explored.

Future research needs to evaluate students' experiences in using technologically enhanced counseling resources, and teachers' growing experience in engaging in this approach should be shared across the profession. Future research can also investigate how front-line career guidance teachers can be better prepared to incorporate use of technology into their counseling practices, and in a macro perspective, how they can equip themselves and also their students with skills (e.g. data analytics, UX design) that are essential to the curriculum of the future (Partovi, 2018).

To help ensure that high school students' future educational choice is consistent, we

can also explore the effectiveness of using a two-way bottom-up and top-down in which high school students are asked first what their academic interest is, then we incorporate technology to inform the students what career path that education in their academic interest would lead to. Then, a top-down approach is performed in which students are asked what their future occupational choice is, then we use technology to check what education is needed to gain entry to that particular profession. The final decision should be the same if the students' choices are consistent.

At practice level, the government should continue to support schools in enhancing school-based career guidance practices. The government can also expand the scope and functionality of current websites that are currently designed for career guidance purposes.

To ensure teachers' professional competency increases, training programs with an examination component can also be introduced to assess teachers' ability to use technology in relation to careers service. It would also be a positive step if basic standards for guidance expertise in this domain could be included in the assessment of secondary school teachers for appointment or promotion. Future research can focus on developing competency and a performance baseline benchmark for school-based career guidance practices.

The government should also consider directing resources to appointing career development specialists (e.g., staff from career centers; human resources experts, NGOs) to lead and monitor quality of career services in secondary schools. Given their professional standing, these experts should be considered the major beneficiary of government support and work with the guidance team in a school to devise a career guidance curriculum that utilizes technology to help students make decisions on further studies and career path. This can help to ensure a more efficient use of government resources due to the tendency of secondary schools in Hong Kong to downplay the importance of non-academic learning-related

activities such as career guidance (Gatsby Charitable Foundation, 2014; Williams, 1973).

Lastly, there should be regular inspection of the quality of school-based career services, as is the custom in countries like Britain and U.S.A. Future government funding should than be contingent on satisfactory inspection results. At the moment, such accountability is lacking in Hong Kong.

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