

Using Computerized Career Guidance Systems with Continuing Education Students

Faye P. Wiesenber, The University of Calgary

ABSTRACT

This paper describes a study conducted at the Faculty of Continuing Education, The University of Calgary, that examined the use of two different computer-assisted career guidance systems (SIGI PLUS and CAREER BUILDER2) with a small group (n=40) of adult learners. The results indicate that both systems significantly increased participants' sense of vocational identity, and that SIGI PLUS was somewhat more effective in this regard than CAREER BUILDER2. Implications for the use of this kind of career service with adult continuing education students are discussed.

RÉSUMÉ

L'article décrit une étude réalisée à la Faculté d'éducation permanente de l'Université de Calgary sur l'utilisation de deux systèmes d'orientation professionnelle assistée par ordinateur (SIGI PLUS et CAREER BUILDER2), avec un petit groupe de 40 apprenants adultes. Les résultats révèlent que les deux systèmes ont accru considérablement le sens de la détermination des acquis professionnels des participants mais que SIGI PLUS est quelque peu plus efficace à cet égard que ne l'est CAREER BUILDER2. On discute aussi les répercussions de l'emploi de ce type de carrière professionnelle avec des apprenants adultes en éducation permanente.

INTRODUCTION

According to recent studies on career development, approximately 29 percent of American adults are either actively in career transition or are anticipating being in career transition in the near future (NCDA, 1990). Statistics Canada reports that in the 1980s, almost half of all workers changed or left jobs once every seven months (Conger, Hiebert & Hong-Farrell, 1993). By the early 1990s it was becoming apparent that the majority of jobs lost were permanent, adding even more uncertainty to an already increasingly transient workforce. Not only job skills but the skills to adapt to transition and change are crucial for job survival today. In its 1990 report, the Canadian Labour Market and Productivity Centre (1990) identified high quality services related to career transition as essential in making Canada a successful player in the competitive global marketplace.

Research in adult education indicates that the majority of adults who enrol in continuing education programs do so for career development reasons (Cross, 1981; Schlossberg, Lynch, & Chickering, 1991). These adult students are usually either anticipating a career change or are actually in career transition. Most Continuing Education units in Canadian universities do not offer career services, and students in continuing education programs usually cannot (due to scheduling incompatibility) access their university's typically daytime career-advising programs.

In the past two decades, computer-assisted guidance systems have gained in popularity and credibility in both educational and corporate settings (Crites, 1992; Harris-Bowlsbey, 1984; Herr & Cramer, 1988; Zunker, 1994). Adult learners generally have a strong tendency toward self-directedness, appreciate anonymity while using resources, and desire a means of control over how they use resources (Harris-Bowlsbey, 1984). These factors make the computer a particularly viable option as an alternative to traditional career-advising services.

A number of studies have demonstrated that young adults in post-secondary settings react positively to computerized career guidance systems (Rayman, 1990). They generally feel that these tools effectively assist them to determine and evaluate important career criteria, and to develop plans of action to achieve selected career goals.

Most studies also support the computer as a valuable tool in the career guidance process with secondary and traditional, full-time post-secondary students (Wiesenberg & Walter, 1983). While some studies have verified its

usefulness with non-student adult populations (Casserly, 1980; Employment & Immigration Canada, 1980 & 1982; Jarvis, 1978), studies evaluating its effectiveness with adult learners in mid-life career transition within a continuing education context do not exist.

Most of the computer-assisted career guidance systems currently being used in Canadian post-secondary institutions were designed as information storage and retrieval systems (i.e., CHOICES, PC Directions, and Career Factory). They do not have a comprehensive teaching/guidance function that addresses the complex career transition issues of mature adult learners, who typically have multiple family/life role responsibilities and often work full time. There are few software packages available with features that address the specific needs of this population, whose profile fits neither traditional college/university students nor employees in organizational settings (a growing career software market). Two programs currently available in the United States that may have the potential to meet mature adult learners' needs are SIGI PLUS and CAREER BUILDER2.

SIGI PLUS emphasizes values, information processing, and decision theory (Katz, 1974). It was developed in the United States for the traditional college/university population and later modified to better meet the needs of mature students. It has nine sections: Introduction, Self-Assessment (draws on work/life experiences), Search, Information, Preparing, Skills, Coping (with student and non-student role responsibilities), Deciding, and Next Steps.

CAREER BUILDER2 focuses on career transition and organizational development theory (Adams & Hopson, 1977). It was originally designed in the United Kingdom for use with employees in organizational settings. It also has nine sections: Getting Started, Transferable Skills, Occupational Interests, Using the World of Employment Map, Work Values (and job satisfaction), Alternative Patterns of Careers (horizontal, steady state, vertical, cyclical), Job-Match (sources of stress), Options for Career Change (inside and outside of the organization), and Objective Setting & Action Planning.

This paper describes a study conducted in the Faculty of Continuing Education at the University of Calgary that examined the use of SIGI PLUS and CAREER BUILDER2 with a small group of adult learners to find out to what extent these computer-assisted career guidance systems developed for other populations (i.e., traditional college/university students and employees in private industry) address the career service needs of mature adult learners within a continuing education setting.

THE PARTICIPANTS

Participants in this study were recruited through an advertisement in the Faculty of Continuing Education's Management Development Certificate Calendar in the Fall'93/Winter'94 and Spring/Summer'94 editions. As a result of limited resources allocated to this research project, there was a waiting list of approximately 50 people who volunteered but were not able to participate. The first 40 individuals who responded and were available during the research project time period composed the participant group.

The 40 participants (10 men and 30 women) range in age from 18 to 56 years, with the average age being 35.5 years. They range in educational background from grade 10 (with 88 percent having more than high school completion, i.e., a certificate/diploma or other post-secondary coursework) to a Masters in Social Work. At the time of the study, all participants worked at least part time. Most were either already enrolled as students in the Faculty of Continuing Education's Management Development Certificate program, or were considering doing so, while 3 of the 40 (7.5 percent) indicated that they had received some sort of career advising/counselling in the past year.

DATA COLLECTION TOOLS

The data collection tools used were: *My Vocational Situation* (a commercially available standardized test), the *Student Response Form*, and the *Advisor Response Form*. The latter two forms were developed by the researcher specifically for this study.

My Vocational Situation (MVS) (Holland, Daiger, & Power, 1980) was designed as a diagnostic tool for use with high school students, college students, and workers. It provides measures of: Vocational Identity (VI) or "the possession of a clear and stable picture of one's goals, interests, personality and talents"; Occupational Information (OI) or "need for vocational information"; and Barriers (B) or "perceived external obstacles to a chosen occupational goal" (Holland, Daiger, & Power, 1980, p. 1). The MVS is written at a grade eight reading level, is self-administered, and can be completed by most people in about 10 minutes. It was normed on 16- to 69-year-old Americans in high school, colleges, and businesses (with educational backgrounds ranging from high school to doctorates in engineering and social sciences, and in a number of diverse work settings).

The MVS consists of: 18 Vocational Identity true/false items such as “no single occupation appeals strongly to me”; 4 Occupational Information yes-no items such as “I need information about how to find a job in my chosen career”; and 4 Barriers yes-no items such as “I am uncertain about my ability to finish the necessary education or training.”

While considered to be still in the developmental stages as a clinical tool (Kapes & Mastie, 1988), the MVS provides an acceptable level of reliability and validity for diagnostic purposes within a research context. Participants completed the MVS just prior to and immediately after their interaction with the computer system.

The *Student Response Form* was developed to obtain participant ratings of quality of service obtained. Participants completed it just after they finished their interaction with the system (see Appendix A). Participants place an X along a six-point scale (ranging from “definitely” to “definitely not”) for each of the 11 descriptive statements. The form ends with a “General Comments” section that allows participants to describe how they feel about the career service that they have just received, and how it could be improved for future users.

The *Advisor Response Form* was developed to obtain advisors’ perspectives on participants’ reactions to the career service received (see Appendix A). This form consists of eight statements that parallel those on the *Student Response Form*, also ending with a “General Comments” section for additional feedback regarding future improvements.

DESIGN OF THE STUDY

The dependent variables in this study are: Vocational Identity, Occupational Information, and Barriers (as measured by the MVS). The independent variable is the computer-assisted career guidance system used by the participant (SIGI PLUS or CAREER BUILDER2). The research question was investigated with data collected from the MVS, and from the *Student* and *Advisor Response Forms*, as well as from interviews with the three student advisors. The two computer-assisted career guidance systems were installed on a computer terminal located in the Management Development Certificate office of the Faculty of Continuing Education. While not ideal in terms of privacy afforded the participants, this location was chosen because of its availability.

Of the three female staff members who acted as student advisors, two had been functioning in this role for at least two years and one was doing so on an “ad hoc” basis. None had used a computer-assisted career guidance system before, however, and a one-day training session was provided prior to the data collection.

Participants were assigned to either SIGI PLUS (n=20) or CAREER BUILDER2 (n=20) based on their ability to fit into a pre-set schedule.

DATA ANALYSIS

In all, 40 complete sets of data were collected, 20 on each computer-assisted system. The three *My Vocational Situation* scores (Vocational Identity - VI, Occupational Information - OI, and Barriers - B) were analyzed via t-tests (Mendenhall & Ramey, 1973). The pre- and post-scores within each of the two groups (SIGI PLUS and CAREER BUILDER2) and the mean scores of the two groups (SIGI PLUS versus CAREER BUILDER2) were compared (see Table 1 for a summary of the MVS mean scores). Differences are considered significant at the .10 level, with the actual probability level reported.

TABLE 1: *My Vocational Situation* Participant Mean Scores

System	Mean Pre-Scores			Mean Post-Scores		
	VI	OI	B	VI	OI	B
SIGI PLUS	7.1	0.9	3.15	10.25	1.9	3.15
CAREER BUILDER2	7.1	0.9	2.75	8.80	1.8	2.80

VOCATIONAL IDENTITY SCORES

There was a statistically significant difference between the pre- and post-Vocational Identity scores on both the SIGI PLUS ($t = 2.09, p < .025$) and CAREER BUILDER2 ($t = 1.73, p < .05$) systems. This means that participants

expressed a significantly clearer and more stable picture of their goals, interests, personality, and talents as a result of their interaction with either system.

On the other hand, there were statistically non-significant shifts that occurred in the pre- and post-scores on VI, depending on which system the participants used. The shifts toward more clarity for those using SIGI PLUS were evident for questions 3 (“I am uncertain about the occupations I could perform well”) and 7 (“I need to find out what kind of career I should follow”). There were no corresponding shifts toward more clarity for those using CAREER BUILDER2 on any of the VI items.

OCCUPATIONAL INFORMATION SCORES

There was a statistically significant difference between the pre- and post-Occupational Information scores on both the SIGI PLUS ($t = 2.09, p < .025$) and CAREER BUILDER2 ($t = 1.73, p < .05$) systems. This means that participants gained a significant amount of occupational information as a result of interacting with either system. There were not, however, statistically significant differences in the specific kind of information participants gained from the two different systems.

BARRIERS SCORES

There were no statistically significant differences in either the SIGI PLUS or CAREER BUILDER2 pre- and post-*Barriers* scores. Neither system appeared to reduce participants’ perceived external obstacles to a chosen occupational goal.

COMPARING SIGI PLUS AND CAREER BUILDER2

The post-test scores of the two systems were compared. While there were no differences between the two systems on the Occupational Information and Barrier scores, there was a difference ($t = 1.35, p < .10$) between the Vocational Identity scores. Participants who used SIGI PLUS had a clearer picture of their goals, interests, personality, and talents than did those who used CAREER BUILDER2.

Student Response Form

Responses to the *Student Response Form* were not analyzed using statistical tests of significance. Rather, the number of responses at the positive end of the continuum was compared to the number of responses at the negative end of the continuum. Participants who used SIGI PLUS were overall more positive in their ratings: 161 of their responses were on the positive end of the continuum compared to 148 responses by the CAREER BUILDER2 group.

SIGI PLUS and CAREER BUILDER2 systems both received appreciative and critical comments in the General Comments sections. Overall, participants using SIGI PLUS expressed a great deal of enthusiasm for the experience and suggested that this kind of career guidance system had a lot to offer adult learners as a group. In particular, they liked the system's user friendliness, comprehensiveness, assessment of current skills, assistance with everyday problems of adults (e.g., child care), and action planning assistance. On the other hand, they criticized SIGI PLUS's slow response time, lack of credit given for past education received, non-Canadian data base of occupations (true for both systems), inability to accept more personalized data, and overemphasis on occupation-specific skills.

While also expressing overall enthusiasm and suggesting that CAREER BUILDER2 had much to offer adult learners, participants who used CAREER BUILDER2 had somewhat different appreciations and criticisms. In particular, they liked the system's comprehensiveness, user friendliness, "change answers" option, the workbook, and discussion on career patterns. They criticized the lack of one-on-one consultation (true for both systems), lack of information on specific occupational fields, and singular focus on people working in "organizations."

Advisor Response Form

Responses to the *Advisor Response Form* were not analyzed using statistical tests of significance. Rather, the researcher tabulated the number of responses at the positive versus negative ends of the continuum. Overall, while advisors' ratings of the eight statements were more positive than negative, they seemed uncertain about just how helpful either system had been to participants. Advisors who worked with participants using CAREER BUILDER2 were marginally more positive: 74 of their responses were on the positive end of the continuum compared to 68 of the responses by the SIGI PLUS group.

In the General Comments section, advisors said that participants seemed equally positive about the results achieved from either system, quite comfortable with the computer system, not in need of assistance once they got started, and to have desired more privacy than the office arrangement allowed.

In a post-data-collection feedback session with the researcher, all three advisors stated that SIGI PLUS seemed easier to use than CAREER BUILDER2. They felt that this might be due to the greater degree of structure provided by SIGI PLUS, as CAREER BUILDER2 had more open-ended questions that required more reflection and independent self-analysis. Advisors also expressed concern that a number of participants who wanted additional career planning assistance after their interaction with either computer-assisted career guidance system had to be referred elsewhere.

DISCUSSION OF RESULTS

The research question posed in this study was "To what extent may computer-assisted career guidance systems developed for traditional college students or employees in private industry address the career service needs of continuing education students?". Analysis of the data provide support for the use of either SIGI PLUS or CAREER BUILDER2 for mature adult learners in a continuing education setting.

Analysis of the MVS data indicate that both computer-assisted career guidance systems resulted in participants gaining a significantly clearer picture of their career-related "goals, interests, personality, and talents," as well as significantly reducing their need for vocational information. The data analysis also provides support (albeit at the $p < .10$ level) for the superiority of SIGI PLUS over CAREER BUILDER2 in terms of participant gains in Vocational Identity scores.

Data from the *Student Response Forms* indicate that while participants like both systems, they like SIGI PLUS better. They also appreciate different features of the two different systems; SIGI PLUS was especially appreciated for its skill assessment module, while CAREER BUILDER2 was appreciated for its discussion of different career patterns. Participants particularly like SIGI PLUS's Implementing Choices module, designed specifically to assist adult learners with non-educational issues such as day care.

Student advisor feedback suggests that participants found SIGI PLUS easier to use than CAREER BUILDER2, perhaps due to the additional structure, linearity, and attention to multiple-role issues provided in SIGI PLUS. It may be that adult learners with multiple-role demands and little energy or time respond more positively to a system that does not require extensive self-analysis.

DIRECTIONS FOR FURTHER STUDY

Two important limitations to this study have implications for the transferability of its findings. First, the small participant group was not randomly selected; a larger and truly random group would more clearly represent the broad spectrum of adult learners and their career transition issues within a continuing education setting. As well, participants were not randomly assigned to the two experimental groups, but assigned based on their ability to fit into a pre-set schedule for SIGI PLUS and CAREER BUILDER2. As a result, there may have been a systematic bias built into these two experimental groups that could have affected the study's outcome. The second important limitation was that both of the computer-assisted systems (SIGI PLUS and CAREER BUILDER2) and the main data collection tool (*My Vocational Situation*) were developed on non-Canadian populations and had non-Canadian data bases.

Further study on this topic should address these limitations and include a follow-up of participants to find out what the longer-term impact has been on their career planning activities. Considerable research conducted on the effectiveness of computer-assisted career guidance with secondary school students has found that the greatest gains (in terms of increased self-knowledge, specific career plans, and decision-making skills) occur when some form of career advising/counselling is available in addition to the computer program (Garis & Harris-Bowlsbey, 1984). Adult learners, who value autonomy and tend to be more self-directed anyway, may not require as much human support.

In spite of these limitations, this study does lend support for the use of computer-assisted career guidance systems with adult learners in a continuing education setting. The fact that both systems (SIGI PLUS and CAREER BUILDER2) significantly improve participants' sense of vocational identity, while reducing their need for occupational information, supports the use of computers as more than information delivery systems in adult learning settings (Keenan, 1987; Walz & Bleuer, 1986). Comments

from participants confirm a need for career services for this group, who tend to “fall between the cracks” in terms of the provision of career services in university settings.

The use of computer technology in adult education holds much promise for improving the accessibility, as well as the quality, of the learning experience. There is little doubt that the provision of career services to continuing education students could further improve the relevance and therefore the quality of the learning experience (Potter, 1994). Adult learners who do not see the relevance in their program, or feel that they are not receiving fair quality of programming for their money, simply drop out of the program. The real issue is defining the nature of the career service that Continuing Education unit administrators feel they can afford. In making this decision, administrators must consider the consequences—in terms of student enrolment and retention rates—of not providing some kind of cost-effective career transition assistance.

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REFERENCES

- Adams, J., & Hopson, B. (1977). *Transition: Understanding and managing personal change*. Montclair, NJ: Allenhald & Osmund.
- Canadian Labour Market and Productivity Centre. (1990). *Report of the CLMPC Task Forces on the Labour Force Development Strategy*. Ottawa, ON.
- Casserly, M. C. (1980). Evaluation of counseling programs in a field setting. In G. G. Ross (Ed.), *Workshop presentations of the World Seminar on Employment Counseling* (pp. 492–514). Ottawa, ON: Canadian Commission of Employment & Immigration.
- Conger, D. S., Hiebert, B., & Hong-Farrell, E. (1993). *Career and employment counselling in Canada*. Canadian Labour Force Development Board. Ottawa, ON.
- Crites, J. O. (1992). Appraising adults' career capabilities. In H. D. Lea & Z. B. Leibowitz (Eds.), *Adult career development: Concepts, issues, and practices* (pp. 69–89). Alexandria, VA: National Career Development Association.

Cross, P. (1981). *Adults as learners: Increasing participation and facilitating learning*. San Francisco, CA: Jossey-Bass.

Employment & Immigration Canada. (1980). *Methods and Materials of Vocational Counselling, Instruction Manual*. (2nd ed.), Ottawa, ON:OCAD.

Employment & Immigration Canada. (1982). *CHOICES*. Ottawa, ON: OCAD.

Garis, J., & Harris-Bowlsbey, J. (1984). *DISCOVER and the counselor: Their effects upon college student career planning progress*. Iowa City, IA: The American College Testing Program.

Harris-Bowlsbey, J. (1984). The computer and career development. *Journal of Counseling and Development*, 63(3), 145–149.

Herr, E. L., & Cramer, S. H. (Eds.). (1988). *Career guidance and counselling through the life span*. (3rd ed.). Glenview, IL: Scott, Foresman & Company.

Holland, J. L., Daiger, D. C., & Power, P. G. (1980). *My Vocational Situation: Description of an experimental diagnostic form of the selection of vocational assistance*. Palo Alto, CA: Consulting Psychologists Press.

Jarvis, P. S. (1978). CHOICES: The system and its applicability to school counseling. *School Guidance Worker*, 33(3), 5–12.

Kapes, J. T., & Mastie, M. M. (1988). *A counselor's guide to career assessment instruments*. (2nd ed.). Alexandria, VA: National Career Development Association.

Katz, M. R. (1974). Career decision-making: A computer-based system of interactive guidance and information (SIGI). In *Measurement for self-understanding and personal development*, Proceedings of the 1973 Invitational Conference (pp. 43–69). Princeton, NJ: Educational Testing Service.

Keenan, T. P. (1987). Adult education and the computer. In W. Leirman & J. Kulich (Eds.), *Adult education and the challenges of the 1990s* (pp. 205–215). London: Croon Helm.

Mendenhall, W., & Ramey, M. (1973). *Statistics for psychology*. North Scituate, MA: Duxbury Press.

National Career Development Association (NCDA). (1990). *National Survey of Working America*. Washington, DC.

- Potter, J. (1994). Improving support services for adult learners. In M. Brooke & M. Waldron (Eds.), *University continuing education in Canada* (pp. 26–35). Toronto, ON: Thompson Educational Publishers.
- Rayman, J. R. (1990). Computers and career counseling. In W. B. Walsh & S. H. Osipow (Eds.), *Career counseling: Contemporary topics in vocational psychology*. (pp. 225–262). Hillsdale, NJ: Lawrence Erlbaum Assoc.
- Schlossberg, N. K., Lynch, A. Q., & Chickering, A. W. (1991). *Improving higher education environments for adults*. San Francisco, CA: Jossey-Bass.
- Walz, G. R., & Bleuer, J. C. (1986). The growth edge: Creative use of computers for facilitating learning and enhancing personal development. Paper presented at ERIC/CAPS Conference in San Francisco, CA. 1986.
- Wiesenberg, F. P., & Walter, L. (1983). *Computerized career information and guidance systems: An evaluation study for Alberta Manpower*. Edmonton, AB: Alberta Manpower.
- Zunker, V. G. (1994). Using computers for career counseling. In *Career counseling: Applied concepts of life planning*. (pp. 123–136). Pacific Grove, CA: Brooks/Cole.

APPENDIX A: STUDENT & ADVISOR RESPONSE FORM QUESTIONS

Student Response Form:

1. It has helped me come to a decision about the kind of program that best suits me at this point in time.
2. It has been a positive experience whether or not I have made a decision about taking a course at this point in time.
3. The assistance that I have received from the advisor has been very helpful.
4. The computer program helped me to find out about my interests, skills, values & needs.
5. The computer program helped me to find out about the world of

work & occupational options in the market place.

6. The computer program helped me to think about different career patterns/alternatives.
7. The computer program helped me to put together a workable action plan.
8. I will recommend this service to a friend.
9. I would be willing to pay for this service.
10. I had enough time to work through the program.
11. I felt comfortable working in the physical space provided.

Advisor Response Form:

1. I helped her/him make a decision about the kind of program that best suits her/him at this point in her/his career.
2. The service was a positive experience, whether or not s/he made a decision about taking a course at this point in time.
3. The assistance that I gave was very helpful.
4. The computer program helped her/him find out about her/his interests, skills, values & needs.
5. The computer program helped her/him to find out about the world of work and occupational options in the market place.
6. The computer program helped her/him think about different career patterns/alternatives.
7. The computer program helped her/him put together a workable action plan.
8. The participant will recommend this service to others.

BIOGRAPHY

Faye P. Wiesenberg is an Assistant Professor and Program Director in the Faculty of Continuing Education, The University of Calgary. She developed and now administers the Certificate in Career Development there. She has twenty years of experience as a career development specialist, working in a number of post-secondary institutions across Canada and as a consultant with the Alberta government. Her key research interests are: adult career development and transition, community-based career services, computer-assisted career guidance systems, and designing instruction for adult learners.

Faye P. Wiesenberg est actuellement professeure adjointe et directrice de programme (counselling) à la Faculté d'éducation permanente de l'Université de Calgary. Elle a fait des recherches, entre autres, sur le développement de carrières pour adultes, l'élaboration de cours pour apprenants adultes ainsi que sur les carrières professionnelles communautaires. Elle travaille dans le domaine de l'éducation des adultes depuis plus de vingt ans, en tant que consultante et enseignante au niveau collégial et universitaire.