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Computer-assisted career exploration: The maturing of a technological infant

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Abstract

This review of the literature presents information about the history and the current use of computers in career and vocational counseling in high schools. Additionally, the strengths and limitations of computer utilization in the secondary school counseling process are discussed.

COMPUTER-ASSISTED CAREER EXPLORATION:

THE MATURING OF A TECHNOLOGICAL INFANT

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This review of the literature presents information about the history and the current use of computers in career and vocational counseling in high schools. Additionally, the strengths and limitations of computer utilization in the secondary school counseling process are discussed.

The pressing issue of this paper is to explore the practical usefulness of the computer in the school counselor's environment. Is the computer and its wealth of data a sound idea and investment for the school counselor, or should the school counselor be concentrating her/his efforts elsewhere? This paper will briefly look at the relatively short history of the computer's involvement in career guidance. This historical dialogue will trace its way to one of the current popular career exploration computer programs, the Career Information Delivery Systems (CIDS) (Dunn, 1983). A closer examination will be made of the Iowa version of the CIDS: the Career Information System of Iowa (CISI) (Koranda, 1978).

The computer may or may not be overrated on its value in the high school counselor's office in particular, or its value in society as a whole. Walz (1984) believed that if the computer is used correctly it could help free the human animal in our complex world of technology. Walz wrote that the computer provides the means for storage and memory capacity so the counselor may respond with individualized data. The

computer also can respond with "infinite patience" in matters
dealing with large and complex data assessment (Katz, 1984).

The use of the computer in the high school counselor's
office is like the use of any other tool available to the
counselor. One must first learn to know its limitations.
Information derived from this tool is no better than what is
programmed into it (Krumboltz, 1985). Too often we accept
the data from the computer as the new gospel. Krumboltz
wanted the reader to remember this:

> The computer can print our falsehoods without becoming
> any more conscience-stricken than a pencil. If the humans
> who give directions have made intentional or unintentional
> mistakes, the report will be faulty. . . We
> must avoid the presupposition that computer-assisted
> career guidance systems are better just because they
> are computer-assisted. (p. 165)

Krumboltz (1985) supported the use of computers in
career counseling. The speed and accuracy provided for
interest inventories, for example, should be a natural benefit
for the counseling profession. But Krumboltz noted some
areas where users of computers may tend to make
"presuppositions" about the superiority of the computer. He
warned us to be critical about the computer-matching of
prescribed occupations to client occupation attributes.

From a practical standpoint, Krumboltz wanted the user to be sure that the computer is better, faster, and more efficient for the counselor than any alternative before deciding to use it.

Historical Perspective

Computers were first introduced into counseling by using the interest inventory as its vehicle (Borgen, 1986). This was a natural introduction because an interest inventory is heavily laden with empirical data. Since the 1920's the interest inventory realm of career counseling has been dominated by the big two inventories: the Strong Vocational Interest Inventory (SVII) and the Kuder Occupational Interest Survey (KOIS) (Borgen, 1986). When technology permitted, by the late 1950's, these interest inventories started to put data in computerized files.

Opportunities to expand the use of computers in career counseling came as a result of "The Great Society" legislation of the Lyndon Johnson federal administration (Koranda, 1978). One of the leading pieces of federal legislation during this administration was: "The Vocational Education Act" of 1963 (Koranda, 1978) which provided for funding and support of vocational education to all persons, in all communities to prepare individuals for gainful employment. The second piece of federal legislation was the 1968 "Educational Amendment"

(Jacobson & Grabowski, 1982) which emphasized vocational

guidance by providing funding for fully functioning career

guidance programs.

Further supportive federal legislation followed in the

1970's (Jacobson & Grabowski, 1982). One of the more relevant

pieces of legislation to this study are the 1976 Education

Amendments, which created the National Occupational Information

Coordinating Committee (NOICC). The NOICC coordinated

development and delivery of occupational information, whereas,

"The Career Education Incentives Act of 1977" provided the

support for career guidance and information delivery systems.

Federal legislation of the 1960's and 1970's led to the

development of State Occupation Information Coordinating

Committees (SOICC) under the direction of the NOICC (Greenwood,

1982). These committees have fostered the development of

new vocational information systems in the various states.

Dunn (1983) described these vocational information systems

as Career Information Delivery Systems (CIDS). The growth

of the CIDS has been considerable, considering the relative

infancy of this type of material (Association of

Computer-Based Systems of Career Information, 1986).

Ethical Standards

Like many other organizations, the growth of CIDS resulted

in the organization of a governing association. In 1982 the

Association of Computer-Based Systems for Career Information (ACSCI) (1982) published the Handbook of Standards for Computer-Based Career Information Systems. The handbook was published as a call for minimum standards for micro-computer software for the CIDS. The handbook covers six main standards: (a) organization, (b) information development, (c) marketing and user services, (d) delivery systems, (e) evaluation, and (f) systems finance. This paper will look briefly at standards "d" and "e".

Of great importance, for the practical use of micro-computer software, are the types of delivery systems (standard "d"). If users are uncomfortable or afraid of delivery-systems (micro-computers), the systems will go unused. Two samples of suggestions given by the Association of Computer-Based Systems of Career Information (1982) about delivery systems are:

Standard 4.3: The delivery systems should present information in an attractive and interesting manner so as to motivate users to continue use of the system and further explore occupational areas. (p. 13)

Standard 4.4: The delivery system components should be user-operable so that independent usage may be fostered. (p. 13)

If the standards from the <u>Handbook of Standards for</u> <u>Computer-Based Career Information Systems</u> are met, most users of the CIDS will be able to obtain competence and familiarity with micro-computer software packages (Association of Computer Based Systems of Career Information, 1982, p. 2).

Standard "e" of the ACSCI <u>Handbook of Standards for</u> <u>Computer-Based Information Systems</u> (Association of Computer Based Systems of Career Information, 1982) deals with system evaluation. The ACSSI was very succinct on its views in this topic. As evaluation of a program called for an annual report with a plan for utilizing evaluation results and a plan for research and development.

Control and evaluation of computerized systems are as essential and as important as are the standards we expect from individual counselors (Katz, 1984). Katz wrote that a counselor may make mistakes with one client but avoid the same mistakes with the next client. However, "...if there is something mistaken, damaging, or wrong stored in the computer, the damage will be perpetuated consistently on many victims" (p. 156).

<u>Selected Micro-computer Programs</u>

In reviewing the literature, numerous occupational information systems were described. What follows is a sampling of the various types of leading information systems.

The Computerized Vocational Information System (CVIS) was developed at Willowbrook High School, Villa Park, Illinois in 1967 (Koranda, 1978). This pioneer system was based on the vocational theory of Dr. John Holland, which identified six major personality types. The CVIS then associated these six major personality types with occupations that Holland considered as forming successful matches (Koranda, 1978). The CVIS was also used as an administrative tool to help with student record storage and retrieval, student scheduling and registration and with attendance reporting (Greenwood, 1982).

The System for Interactive Guidance and Information (SIGI) (Koranda, 1978) was a computer-based system developed at the Educational Testing Service in Princeton, New Jersey, funded by the Carnegie Corporation. Dr. Martin Katz (Association of Computer-Based Career Information Delivery Systems (1985), the designer of SIGI, once described it as "based on a humanistic philosophy. . ." (p. 88) by providing a highly personalized way to learn about careers and the education needed to prepare for careers. The SIGI emphasizes the process of decision making by utilizing four main components: values, information, prediction, and planning (Greenwood, 1982).

By far, the career computer systems having the greatest impact in the counseling field are the statewide Career Information Delivery Systems (CIDS) (Dunn, 1983). Dunn reported that in 1983 there were approximately 11,600 user sites in 39 different states. By 1985 CIDS were used by more than 4.5 million career seekers to explore their options in the world of work, and user sites had increased to 12,262 (Association of Computer-Based Systems of Career Information, 1985).

The five states with the most user sites were Michigan (2,000), Florida (1,000), Washington (860), Iowa (850), and Wisconsin (600), according to Dunn (1983). Elementary and secondary schools continued to account for two-thirds (8,112) of the sites served by CIDS according to the 1984-85 Directory of State-Based Career Information Delivery Systems (Association of Computer-Based Career Information Systems, 1986).

A study made by Chapman and Katz revealed information that supported the popularity of the CIDS. In a survey of 4,482 randomly selected students in New Jersey the students preferred to use computerized career information services when given the option of computer assisted help.

The local version of the CIDS is called the Career Information System of Iowa (CISI) (Koranda, 1978). The CISI has been available at a modest fee to the user from the Iowa

Department of Education since August of 1974. The CISI began

as a card sort system and an on-line computer system available

to local phone customers in the Des Moines metropolitan area.

The CISI is now available on "floppy-disc" software for use

in Apple II or IBM PC micro-computers (Iowa Department of

Education, 1987).

The CISI reported usage during 1984-85 at 572,446 users

(Association of Computer-Based Systems Career Information,

1986). This is almost one-fifth of the entire state's

population. Of this number, 260,063 users (46% of total

usage) were junior and senior, public and parochial high

school students. The state's three regent universities and

thirteen area community colleges recorded 111,315 users during

that same time period.

Iowa's operating budget for the Career Information System

of Iowa during 1984-85 was $373,906 (Association of

Computer-Based Career Information Delivery Systems, 1986).

In comparison, the CIDS in Florida (with a much larger

population base) reported the number of users in 1984-86 at

88,370 with an operating budget of $313,119. Also, a

comparable midwestern state, Wisconsin, reported approximately

240,00 users during 1984-85 using an operating budget of

$451,620.

Limitations of Micro-computer Programs

In a paper, Koranda (1978) looked at the accomplishments of the Career Information System of Iowa. Koranda was using data from a survey of 625 Iowa high school seniors. The data indicated that the CISI-exposed students' mean response was not significantly higher than the mean response from the non-CISI-exposed students in five of six research items:

A. Identifying Training Sources

B. Identifying Occupational Attributes

C. Identifying Occupational Clusters as They Relate to Specific Occupations

E. Identifying Her/His Intended Postsecondary Plans

F. Finding Occupational Information Easily Attainable. Only in the area of being able to identify related salaries for selected careers did the mean response from the CISI-exposed students rank significantly higher than did the mean response from the non-CISI-exposed students.

Through the use of the statewide Career Information Delivery System (Dunn, 1983), such as the CISI, and the use of computer assisted interest inventories, such as the SCII (Goodson, 1981), it would appear that young people and their counselors had a most decided edge towards career choice. Goodson (1981) reported that use of interest inventories to help with career and vocational choice has become an American

Institution; however, Goodson noted ". . . findings suggest
that interest inventories may not aid students toward their
career choices as much as is assumed" (p. 3).

Many times the use of two different interest inventories
with the same client will lead to conflicting interpretations.
Borgen and Selings (1978) reported that actual "expressed"
choices by the client were found to be two to three times
more accurate than were the responses of clients who used
the Strong-Campbell Interest Inventory. In this study 270
university students participated. The authors concluded
that those using interest inventories should not rely heavily
on them for the strict purpose of career selection (Borgen &
Selings, 1978).

Positive Micro-computer Applications

Thus far the literature review has revealed either a
negative or a mixed review on the effectiveness of
computer-based guidance systems. The following are positive
findings from the literature review. Clyde (1979) believed
that the teaching of decision-making processes, if properly
administered, will be internalized by the client to be used
again in subsequent career decisions. Clyde also noted that
career information delivery systems work to enhance the
retention of occupational information by the client, which
will also help the client in future career decisions. Hence,

CIDS are useful because they assist clients in learning about the decision making processes and enhance retention of occupational information by clients, according to Clyde.

Other writers support Clyde's point of view. Harris-Boulsbey (1984) wrote that the computer guidance system "shepherds and monitors" (p. 5) the student through a decision-making process even if the user does not realize it. Borgen (1986) agreed that the micro-computer will support the decision making process.

Chapman and Katz (1983) agreed that micro-computers can facilitate the decision making process because of their capability to organize and reorganize data. These writers noted the micro-computers' speed as the most positive aspect in the decision making process.

Walz (1984), on the other hand, pointed to the computers' "mechanical patience" (p. 137). This makes the computer an excellent tutor for career and life decision making and problem solving.

Katz (1984) wrote that the computer ultimately "provides a strategy for making a decision" (p. 156). The client can eliminate unimportant or irrelevant information, then following the computer's structure it enables the client to focus on important and relevant data.

A study done by Tyron (1983) on the effects of career

selection after use of the Strong Campbell Interest Inventory

also yielded some similar results. Participants in the study

were ninety-six students in their freshman year of college.

The differences between counseled students and non-counseled

students were that students who worked with a counselor on a

career program were classified by Tyron as the following:

(a) More involved in school and interested in education,

(b) More given to introspection and problem solving, and

(c) More interested in self-expression. In fact, students may

be inclined to seek more information from published career

information or from an individual in a particular career

than students not exposed to computer supported career

information material (Johnson & Sampson, 1985).

In the Iowa Career Information System (Iowa Department

of Education, 1987) the decision-making process is code named

Quest. "Quest is an introductory questionnaire which helps

students explore occupations related to their self-assessed

interests and abilities" (Greenwood, 1982, p.20).

The 1987 CISI Process Handbook offered this further

explanation of Quest:

> Quest is not a test. It does not have right and wrong
>
> answers. It does not tell students what they should
>
> become. Instead, it is a good method to begin career

planning. It helps you think about your preferences

and abilities and match them with occupations. (Iowa

Department of Education, 1987, p. 34)

The CIDS, through the delivery of career and vocational

information on micro-computers, will free the counselor from

tedious statistical chores, so more valuable effective time

may be spent on person-orientated counseling (Crites, 1987).

"Only the human counselor is capable of recognizing and

responding flexibly and specifically to such a variety of

individual needs" (Katz, 1984, p. 153).

Childers (1985) reinforced the concept of computer

"enhanced" career counseling. If counselors use the

micro-computer effectively, less time will have to be devoted

to the information retrieval process and analysis. Hopefully

this will free the counselor from clerical chores so she/he

may become more aware and responsive to individual cues and

group interactions. Computers in the counselor's office could

be used for repetitive tasks to free the counselor for tasks

more suited for their expertise (Sampson & Pyle, 1983).

In order to use computer/assisted counseling most

effectively, counselors will have to learn to recognize which

clients will benefit from using the computer and which clients

will benefit from more human intervention (Walz, 1984).

Counselors will also need to learn to "operate in concert"

(Sampson & Pyle, 1983, p. 9) with computer-assisted guidance
systems to provide services that the human/machine combination
are the most proficient at delivering the desired results.

Counselors will not only be able to add to their
efficiency, but they will be able to multiply their power
(Harris-Boulsbey, 1984). Micro-computers should be used as
instruments of "exponential relationship" (p. 2). The
possibilities of counselor efficiency, although not infinite,
certainly are very powerful.

Conclusion

This review of the literature has shown that computers
are here to stay and will be utilized to greater degrees in
the future. However, as noted at the outset, counselors and
others involved in the coordination and delivery of career
guidance materials need to remember that computer delivery
systems are tools. As with any tool, use of a computer
delivery system must be evaluated to make sure that it is
doing the job it was designed to do. Thus, interest
inventories and information delivery systems used in
conjunction with computers need to be constantly evaluated
to determine if they are helpful for those they were designed
to help (Goodson, 1981). With the evaluation data, guidance
programs could choose those Career Information Delivery
Systems, interest inventories, or other career tools that

prove to be most effective in aiding student career development.

It would appear that micro-computer systems have failed to give students an adequate foundation in exploration of employment opportunities and the integration of work values and skills. However, the use of computer systems is making an impact in helping students with personal decision-making skills. This small success may challenge the school counselor to reevaluate his/her own personal situation and to strive to promote a positive exploration process.

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