A Differential Feature-Cost Analysis of

DISCOVER for Adult Learners and SIGI PLUS:

Technical Report Number 4

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DISCOVER for Adult Learners (DISCOVER AL) and SIGI PLUS
are newly developed computer-assisted guidance systems
designed to assist individuals in making career decisions.
Career guidance services wishing to explore the adoption of
such systems could well profit from a comparison of the
differential features and costs of the respective systems.
Therefore, the purpose of this technical report is to
highlight similarities and differences between two computer-
assisted career guidance systems for adults, so that service
providers may make informed choices concerning the adoption
of such systems.

In order to make differential comparisons, the
following rubrics were employed: (1) user friendliness
(human factors), (2) information for career decision-
making, (3) decision processes on which programs are based,
(4) support materials, (5) differential cost analysis, and
(6) limitations.

This report was prepared for the Clearinghouse for
Computer-Assisted Guidance Systems at Florida State
University. The Clearinghouse was established to provide
current and readily accessible information relevant to
selecting, implementing, and evaluating computer-assisted
career guidance systems. The contents of this report
consist primarily of a complete descriptive listing of the
features and costs of DISCOVER AL and SIGI PLUS. The
information presented in this paper was gathered from the
manuals provided by the respective firms, American College
Testing Program (DISCOVER AL) and Educational Testing
Service (SIGI PLUS), interviews with ACT and ETS staff
members, as well as the collective experiences of the
authors as they themselves and their clients interacted with
the systems. The criteria used in this analysis are based
on the work of Harris-Bowlsbey (1983), Katz and Shatkin
(1983), Maze (1984), Maze and Cummings (1982) and Riesenberg
(1983). A draft of this report was sent to developers of
the two systems, and their comments were used by the authors
in preparing this final document.

Several aspects of this report should be noted: (1) a
more detailed analysis of the systems was omitted because of
space and length considerations; (2) this documentation is
the result of the authors' analysis only, not the systems'
developers; and (3) this report is not intended to be a
marketing or promotional device for either system - that
information is available directly from ACT and ETS. The
following analysis presumes that the effectiveness of the
two systems is equivalent. The purpose of this analysis is
to provide an objective and current descriptive comparison

of features and costs for DISCOVER AL and SIGI PLUS.
Therefore, the reader is strongly encouraged to examine
future research reports to ascertain the relative merit of
these features and costs.

While every attempt has been made to be fair and
accurate, the reader must be aware of the inherent
limitations of any methodology. Here, in the interest of
clarity, a "checklist" comparison of systems was used, i.e.
"Feature X: Does System A have it? Does System B?" Such an
approach effectively simplified a mass of data; the
potential problems arise where this methodology
oversimplifies.

Certain characteristics cannot be adequately explained
by this "yes"/"no" analysis. For example, the checklist
indicates that System A handles "understanding life-career
roles" and System B does not, while System B handles "issues
related to child care" but System A does not. These
statements may be true, but not fully informative. The real
point in these examples is that where System A concentrates
more on general concepts, System B offers more specific
information on coping with new life-career roles. The
decision as to which approach is "best" depends on typical
client needs as well as the theoretical orientation and
assumptions of staff members. This comparative analysis is
therefore intended not as a "scoresheet" but as a
preliminary guide for further detailed consideration if a
particular characteristic is important for a given
clientele. It is hoped that although this method may blur a
few trees, it can provide a useful map of the forest.

User Friendliness (Human Factors)

Both SIGI PLUS and DISCOVER AL are fairly similar in
their attempt to be user friendly. Both systems are run on
the IBM PC-XT and employ several basic function keys (F1,
F2, etc.) to operate the program. Both allow the user the
"back up" through the program. Both systems rely heavily on
print screen displays with limited use of graphics to
present information. The order in which sections of the
programs can be used can also be managed at the keyboard.

As for differences, SIGI PLUS provides an introduction
to the systems in which a pathway is recommended for the
user. SIGI PLUS provides a layering of detail of the given
information by depressing the "9" key thereby accommodating
users who need examples or more in-depth descriptions.
While both systems allow for individual responses at various
points, DISCOVER AL permits the use of actual statements by
the clients and uses these statements in the program. SIGI
PLUS, on the other hand, refers to an individual's
supplementary information as "other factors." In one

section, DISCOVER AL actually becomes a word processor.
While both systems provide summaries at the end of a user's
individual appointment time, DISCOVER AL provides periodic
summaries throughout the program and allows users to save
and retrieve their records for use at another time. SIGI
PLUS maintains no user record once the user elects to leave
the system. A summary table of user friendly features is
prescnted in Table 1.

Insert Table 1 about here

Information for Decision Making

Four categories of information for decision-making will
be compared for SIGI PLUS and DISCOVER AL. They are: (a)
comprehensiveness, (b) currency, (c) organization and (d)
printouts.

Comprehensiveness

Both systems offer the traditional components of the
career decision-making process in an apparently linear
fashion (i.e. from self-assessment through implementation).
However, SIGI PLUS recommends alternate paths through the
system depending on the user's current situation and needs.
There are also other significant differences in the
respective approaches of the two systems.

Self-Assessment. SIGI PLUS includes self-assessment
in values, interests, abilities, and activities. DISCOVER
AL includes these same general areas of assessment as well
as life career roles, life transitions, and past
experiences. DISCOVER AL also provides an option for
inputting external assessment data such as ACT scores. SIGI
PLUS provides a more detailed skills assessment while
DISCOVER AL provides the opportunity to incorporate
information from outside assessment instruments.

Identifying Occupational Alternatives. SIGI PLUS
generates occupational lists on the basis of user
preferences pertaining to the given assessment factors.
DISCOVER AL generates occupational and/or major lists on
the assessment factors as well as in the World-of-Work Map.
SIGI PLUS is more interactive in nature by allowing the user
more freedom to manipulate variables.

Obtaining Occupational Information. SIGI PLUS provides
job descriptions on 223 occupational titles, uses 520 job
titles for generating occupational alternatives, and refers

to a total of 1500 job titles. For specific information on
a given occupational title, SIGI PLUS can give 27 different
categories of information and another 5 factors related to
preparation for the occupation. DISCOVER AL, on the other
hand, provides descriptions for 417 occupations in 23 Job
Families and gives 16 categories of information for a
selected occupation.

   Education Information. SIGI PLUS concentrates on
occupations and DISCOVER AL concentrates on schools. What
SIGI PLUS provides is an occupation-specific program and
course descriptions plus information on educational support,
such as financial aid and home-study. DISCOVER AL provides
an educational search function and descriptions of 2-year,
4-year, graduate and external degree programs and schools.
Thus, DISCOVER AL is more useful for locating a specific
institution to attend.

   Adult Factors. SIGI PLUS provides information and
instruction on some of the issues specific to adults such as
child care, time management, and home-job factors. DISCOVER
AL focuses on change issues and addresses 8 roles adults may
play as well as provides an assessment and suggestions with
respect to career transitions.

   Decision-Making. Both systems include decision-making
information which will be elaborated upon in the Decision
Process section of this paper.

   Employment Planning. SIGI PLUS focuses on the action
planning process and transition to subsequent steps beyond
use of the computer system. DISCOVER AL focuses
specifically on job acquisition and the topics of interview,
cover letter, and resume. For the latter, the system
becomes a word processor and allows the user to develop a
draft of a resume.

   More specific detail on the above content areas is
presented in Table 2.

Insert Table 2 about here

Currency

   Both SIGI PLUS and DISCOVER AL are updated at least
annually and provide information which is consistent with
other occupational and educational information available
through other media formats, i.e., books, pamphlets, etc.

Organization

Both SIGI PLUS and DISCOVER AL are organized in systematic ways leading from self-assessment to implementation phases. SIGI PLUS includes 9 sections while DISCOVER AL includes 6 modules. The major difference between the two systems occurs in the sequence of content. SIGI PLUS includes the decision-making component after the educational information section, while DISCOVER AL includes educational information after decision-making. Both systems allow the flexibility of using various sections/modules in any order the user may wish.

Printouts

SIGI PLUS and DISCOVER AL both provide the user with printouts that can be viewed at later times. Both will prompt the user to make printouts of key information. There are several differences between the two systems with respect to printout choices. SIGI PLUS allows the user to make copies of selected "key" screen displays, while DISCOVER AL allows any screen display to be "dumped." SIGI PLUS printouts include the user's name, the date, and a title that describes the information presented to the user. SIGI PLUS provides a summary at the time the user signs off, indicating name, date and system features completed at the present session at the computer. DISCOVER AL provides a summary at the time the user signs off, indicating name, date and summary of information stored about the user under labeled categories.

Decision Process

Both SIGI PLUS and DISCOVER AL include instructional materials to assist the user in becoming familiar with their respective decision making processes. SIGI PLUS integrates decision-making into the entire program with users being asked to make decisions about specific topics throughout the sequence. DISCOVER AL, on the other hand, includes a separate decision-making module which users may apply to specific personal situations such as taking a specific job or role. SIGI PLUS also provides a separate decision section which may help the user evaluate three occupations at a time with respect to chances for success and rewards.

For users who choose to use parts of the system at different times, the systems differ in how they may aid decision making. As stated above, DISCOVER AL maintains a record in storage while SIGI PLUS does not. Therefore, DISCOVER AL can provide a retrieval of information to enable the user to return to a previous point in the decision

process. The SIGI PLUS user may require the assistance of a staff member and a copy of their previous printouts to return to a specific point in the decision process should interruption be necessary.

Support Materials

Both SIGI PLUS and DISCOVER AL provide support materials for the user as well as the professional. SIGI PLUS provides an individual User's Guide, which may be used prior to an appointment time. DISCOVER AL provides a User's Guide, which can be used to guide an individual while on the system. SIGI PLUS provides separate lists of computer instructions, printouts, and occupations. In addition, SIGI PLUS provides SIGI PLUS: A Guide to Further Resources, another individually-oriented consumable booklet which users may take with them after employing the system. In DISCOVER AL, the more detailed descriptions of the World-of-Work Map, Abilities and Skills are in the User's Guide. DISCOVER AL also provides a package of training materials comprised of a manual for the site administrator, a workbook for the counselor, and a two-hour videotape. A summary of support materials and hardware compatibility is presented in Table 3.

Insert Table 3 about here

Differential Cost Analysis

Both systems provide options to enhance their respective "basic packages." The relative add-on options as well as differences in cost related software licenses are presented in Table 4. The data presented refers to direct costs only.

Insert Table 4 about here

Limitations

Problems and Constraints. As with most computer
guidance systems, both SIGI PLUS and DISCOVER AL have
limitations for their clients. Both systems depend upon
clients who can read and understand the presented material.
Both depend on accuracy of and understanding of the self-
assessment information. Both make summary statements with
respect to the user's consistency and validity of assessment
statements. It is possible on both systems to reach
conclusions or be given statements based upon inaccurate
assessments.

REFERENCES

Harris-Bowlsbey, J.   (1983).   A historical perspective.   In
    C.S. Johnson (Ed.).   Microcomputers and the school
    counselor (pp. 1-16).   Alexandria, VA: American School
    Counselor Association.

Katz, M.R. & Shatkin, L.   (1983).   Characteristics of
    computer-assisted guidance.   The Counseling Psychologist,
    11(4), 15-31.

Maze, M.   (1984).   How to select a computerized guidance
    system.   Journal of Counseling and Development, 63, 158-
    161.

Maze, M. & Cummings, R.   (1982).   How to select a computer-
    assisted career guidance system.   Madison, WI:
    University of Wisconsin, Wisconsin Vocational Studies
    Center.

Riesenberg, B. (1983).   Considerations in the selection of a
    computerized guidance system.   In C.S. Johnson (Ed.),
    Microcomputers and the school counselor (pp. 17-29).
    Alexandria, VA: American School Counselor Association.

Table 1

Summary Comparison of User Friendly Features

Human Factors	DISCOVER AL	SIGI PLUS
color video displays	yes	yes
system content color-coded	yes	yes
graphics enhanced screen displays	yes	yes
upper/lower case characters	yes	yes
special purpose function keys		
back-up function	yes	yes
quick exit	yes	yes
print screen	yes	yes
menu drive screen sequencing	yes	yes
preliminary operating instructions	yes	yes
prompting for user input	yes	yes
user controlled access to		
system content	yes	yes
explicit recommended pathway		
for use of system		
based on user characteristics	no	yes
novice/expert access mode	yes	yes
all screen displays suggested for		
printing are formatted		
specifically for use as print-		
outs	no	yes
screen substitutions	yes	yes
availability of optional detailed		
information (layering)	no	yes
user memory record (system capabil-		
ity to store user data between		
sessions)	yes	no
integration of user data from		
printouts at different points		
in the system	yes	yes

Table 2

Summary Comparison of Information for Decision Making

System Content	DISCOVER AL	SIGI PLUS

User access

User access to system content influenced by a model of career decision-making	yes	yes

Introduction

orientation to function keys	yes	yes
overview of system content	yes	yes
explicit recommended pathway for use of the system based on user characteristics	no	yes

Self-assessment

life-career roles	yes	no
life transitions	yes	no
interests/fields of knowledge	yes	yes
abilities/activities	yes	yes
experiences	yes	no
values	yes	yes
characteristics necessary for success in nontraditional ed.	yes	no
capability to input scores from external paper & pencil assessment instruments (e.g., ACT scores)	yes	no

Identifying occupational alternatives

capacity to select specific assessment variables for identifying occupational alternatives	yes	yes
capacity to select factors the user wishes to avoid in identifying occupational alternatives	no	yes
capacity to determine why a particular occupation does not appear on the user's list	yes	yes

(table continues)

System Content	DISCOVER AL	SIGI PLUS
Obtaining occupational information		
capacity to browse through occupational information using a World of Work taxonomy	yes	no
capacity to ask a variety of questions about specific occupations	yes	yes
capacity to present information on two occupations on one display/printout	no	yes
multiple sources used to develop occupational information	yes	yes
annual updating of salary and employment outlook data	yes	yes
all other occupational info reviewed on a three yr. cycle	yes	yes
information provided:		
definition of occupation	no	yes
work tasks/activities	yes	yes
typical job titles	no	yes
relat. occupations/specialties	yes	no
work location/where employed	yes	no
work setting	yes	yes
special conditions	no	yes
necessary tools & equipment	yes	no
training pathways/specific occupational training/ educational requirements	yes	yes
required college courses	yes	yes
personal qualities	yes	yes
skills required	yes	yes
generic skills required in management	no	yes
other requirements: experience/ licensing/certification	yes	yes
interest fields/likes & dislikes	yes	yes
beginning income	yes	yes
average income	yes	yes
top earning possibilities	yes	yes
salary range	yes	yes
promotion/advancement opportunities	yes	yes
employment outlook	yes	yes
security/effect of economic conditions	yes	yes
seasonal/geographic limitations	yes	no

(table continues)

System Content	DISCOVER AL	SIGI PLUS
information provided (cont.):		
personal values		
(e.g., contribution to		
society, leadership,		
prestige level, leisure,		
independence, variety)	no	yes
where to find more information	no	yes
number of occupations included	417	223
number of job titles	417	1500

Educational Planning

capacity to select specific		
search variables for		
identifying educational		
alternatives	yes	no
capacity to complete		
two-year college search	yes	no
four-year college search	yes	no
graduate & professional		
school search	yes	no
external degree program search	yes	no
overview of nontraditional		
approaches to education	yes	yes
capacity to obtain info. on		
two-year colleges	yes	no
four-year colleges	yes	no
graduate & professional schools	yes	no
external degree programs	yes	no
overview of how to prepare for		
specific occupations	no	yes
typical generic programs of study		
for specific occupations	no	yes
description of work tasks to		
encourage learning by doing	no	yes
user estimation of chances of		
successfully completing a		
preparation program	no	yes
development of an educational		
action plan	yes	yes

Coping with adult transitions

understanding life-career roles	yes	no
understanding adult transitions	yes	no
general information re:		
time management	no	yes
calculating preparation costs	no	yes
internship/co-op placement	no	yes
financial aid	no	yes

(table continues)

System Content	DISCOVER AL	SIGI PLUS
child care	no	yes
care for adults	no	yes
finding accredited home-study courses	no	yes
credit via standardized testing	yes	yes
credit for military training	yes	yes
credit for prior learning	yes	yes

Decision making

System Content	DISCOVER AL	SIGI PLUS
general description of a career decision making model	yes	yes
integration of summary data from all other system modules into the decision making module	yes	yes (only if system is completed in one sitting)
integration of three occupational alternatives into a decision making matrix that balances potential rewards and chances of successfully completing preparation requirements, for the purpose of identifying a tentative choice	no	yes
feedback to the user regarding the characteristics of his or her tentative choice	no	yes

Employment planning

System Content	DISCOVER AL	SIGI PLUS
user identification of the characteristics of the job and organization being sought	yes	no
general information re:		
resume writing	yes	yes
letter writing	yes	no
job interviewing	yes	no
demonstrating job skills	no	yes
building a network of contacts	no	yes
writing a resume	yes	no
cover letter practice exercise	yes	no
drafting questions to ask during an interview	yes	no
overview of how to prepare and skills required for specific occupations	no	yes
identifying "next steps" in achieving career goals	no	yes
identifying options for developing new skills	no	yes

(table continues)

System Content	DISCOVER AL	SIGI PLUS

User Exit

review of all system modules completed to date	yes	no
review of all system modules completed during this session at the computer	yes	yes
identifying occupations to be maintained in the user record	yes	no
completing a brief on-line anonymous evaluation questionnaire (optional)	yes	no

Local Data Option

capacity to integrate local data into the system	yes (completed at the DISCOVER center)	yes (completed at the user site)

Table 3

Summary Comparison of Support Material Available from
Developers and Hardware Compatibility

                                        DISCOVER AL   SIGI PLUS

Support Materials for Users

non-consumable user guide	yes	yes
non-consumable list of occupations	yes	yes
non-consumable list of majors and		
post-secondary educ. instit.	yes	no
non-consumable poster - world of		
work map	yes	no
consumable user guide	no	yes
consumable guide to follow-up		
activities/additional resources	no	yes
consumable printout checklist	no	yes

Support Materials for Institutions

newsletter	yes	yes
professional manual	yes	yes
training videotape	yes	no

Technical Support for Users
  by Phone

	yes	yes

Training from the Developer

on-site training	yes	no
national/regional conferences	yes	yes

Reference Documents

system design process & assumptions	no	yes
pilot test data	no	yes

Hardware Compatibility
(all require a fixed disk drive)

IBM PC with expansion unit	yes	yes
IBM PC-XT	yes	yes
IBM PC-AT	yes	yes
Tandy 1200	yes	yes
Leading Edge PC	no	yes
COMPAC+ PC	yes	yes
AT&T PC	no	yes
Zenith PC	no	yes

Table 4

Summary Comparison of Differential Cost Feature Analysis

Feature	DISCOVER AL	SIGI PLUS
Hardware		
system unit	K[a]	K
color monitor	K	K
printer	K	K
Hardware Maintenance	K	K
Software License (1 year)		
system	$1750.00	$1375.00
		($1075.00-3
Support Materials		yr. license)
consumable (assumes 500 users per year)		
user guide		
($15.00 per 50 copies)	N/A	$150.00
follow-up activities		
($15.00 per 50 copies)	N/A	$150.00
printout checklist		
($5.00 per 50 copies)	N/A	$50.00
nonconsumable		
newsletter	N C	N C
user guide	N C	N C
professional manual	N C	N C
poster- world-of-work map	N C	N/A
DOT crosswalk	N/A	N C
training videotape	$50.00	N/A
general information		
career dec. making info.	K	K
occupational info.	K	K
educational info.	K	K
Technical Support	user places call	800 number
Supplies		
computer paper	K	K
printer ribbons	K	K
		(table continues)

[a]
K   = Constant (costs potentially equal for both systems)
N/A = Not available from the developer at this time
N C = No charge

Feature	DISCOVER AL	SIGI PLUS
Facilities		
physical renovation		
(if necessary)	K	K
furnishings		
(if necessary)	K	K
Personnel		
direct interventions		
with users	K	K
administration	K	K
materials development		
(system specific	K	K
Training from the Developer		
on-site training	N C	N/A
nat./regional conferences		
registration fee	$50.00	$60.00
travel expenses	K	K
TOTAL	$1850.00 (plus constant)	$1785.00 (plus constant)