
Hypermedia and Career Counselling for Personal Flexibility

Maria do Céu Taveira

Universidade do Porto, Portugal

Abstract

Computer-assisted career guidance systems (CAGS) are the most important technological innovation in career counselling in the last 20 years. Some information and learning CAGS have been recently designed to assist clients in career-planning proficiency and personal autonomy and flexibility. In this sense, specialized research is needed to explore the innovative questions of Psychology/New Information Technology interface domain for career counselling and development. A computer-assisted career guidance system — PROJECTOS — for secondary students, and developed in Hypermedia, is presented. The goals, rationale, scope, structure, content and procedures of the system are exemplified. Advantages of designing Hypermedia for career counselling for personal flexibility are discussed.

Résumé

Les systèmes informatisés d'orientation professionnelle (CAGS) représentent la technologie la plus innovatrice dans l'orientation professionnelle des 20 dernières années. Des CAGS d'information et d'apprentissage ont été conçus récemment pour aider les clients à planifier leur carrière ainsi que pour atteindre une plus grande autonomie et souplesse personnelle. Dans ce contexte, des recherches devront être menées pour explorer les questions innovatrices du domaine de la psychologie et de l'interface technologique des nouvelles informations dans l'orientation et le développement professionnel. PROJECTOS, système informatisé d'orientation professionnelle pour les élèves du secondaire et créé en Hypermedia, est présenté. Les buts, la justification, l'échelle, la structure, le contenu et les étapes du systèmes sont discutés. Les avantages du concept Hypermedia dans l'orientation professionnelle pour une souplesse personnelle sont avancés.

The primary goal of this study was to design, develop, produce, and evaluate a prototype of a computer assisted career guidance system for use in Portuguese secondary education. This study is part of a larger research project on New Information Technology and Career Development. It focused on the use of computer technology in counselling and career development.

RATIONALE FOR THE STUDY

Career Counselling and Personal Flexibility

More commonly, clients enter counselling with gaps in their readiness and ability to decide. Among the tasks of career development, career decision-making assumes a central role in career counselling and involves the processes of exploration and of commitment — psychological processes in the relationship between individuals and the world. One recent goal of career counselling is to promote acquisition of personal flexibility, as an ideal mode for coping with continuous change and complexity in society,

especially in the occupational world. The hope is that personal flexibility will help individuals to generate and coordinate flexible and successful responses to demands, and to generate and capitalize on opportunities in the environment in order to improve their career development. Individuals are thought not only to acquire knowledge about themselves in career situations but also to learn new ways of thinking through the counselling process. In this sense, personal flexibility may also be assumed as a cognitive style that has an important property: non-linear thinking. Sometimes counsellors view a cognitive style, referred to as post-conventional, relativistic, or critical thinking, as a desirable goal of the career counselling process. These cognitive styles share the emphasis on movement toward non-linear thinking.

In the last 20 years, it has also been widely accepted that career development can be improved through the use of computer-assisted career guidance systems (CAGS) (Taveira & Campos, 1989). Until recently, most career guidance software was designed to promote essentially linear thinking. In general, they use sequential methods for searching information with text format, and are based on compensatory and exhaustive approaches to information. Typically, the more sophisticated systems are conceived as self-help materials, assume software versions on IBM or IBM-compatible microcomputers and provide some combination of (a) self-assessment, (b) dissemination of occupational and educational information, (c) the generation of career alternatives, (d) instruction in career decision-making, and (e) a planning process for implementing choices.

Hypersystems and career counselling for personal flexibility

Hypertext systems use non-linear and non-sequential information structures and do not require the user to follow pre-determined structures or access routes through bodies of information (like in traditional CAGS); data within the system can be endlessly cross-referenced, routes can be determined by the user, and multiple meanings can be created, according to their needs and disposition (McAleese, 1989).

Sequential models of information searching and processing do not necessarily describe the way people process the information and make their decisions. Conversely, non-linear and non-sequential relations between bodies of information seem to be more adequate to develop guidance software. In fact, research on the strategies for collection and processing of occupational information in making career decisions points out that most career decision-makers are very parsimonious in exploring information. They consider aspects that are clearly nonindependent and, in most cases, they use a strategy of following only some of the options rather than all of them; they also search more information in some alternatives

than on others and, moreover, the larger the number of potential alternatives considered, the lower the percentage explored (Gati & Tikotzi, 1989). Hypertext models offer an environment that attempts to simulate on-line human processes of exploration.

Hypermedia systems may assume hypertext style and combine text, pictures, diagrams, animations, sound, video, data-bases, and external programs (Nielsen, 1990). The software under development, PROJECTOS, addresses the facilitation of personal flexibility and of critical thinking through the use of sophisticated educational software. PROJECTOS is being developed in HyperCard and uses Hypertext and Hypermedia models. *HyperCard* is an authoring tool and an information organizer which embodies a powerful programming language (HyperTalk) with strong parallels with object-oriented environments (OOE) and hypertext style (Williams, 1987). *HyperCard* provides the users with the possibility to create semantically meaningful relationships between different information and ideas and promotes connectivity (the ability to show that any single concept, problem, or idea must be understood from a variety of perspectives) (Beeman et al., 1987).

In short, the use of Hypermedia in CAGS makes it possible to pursue and to facilitate, with the computer, some of the present values for human development such as personal flexibility, autonomy, and self-proficiency, in planning a career.

PHASES OF DEVELOPMENT

Theory and Practice: needs and services

First, a study of the feasibility of developing a CAGS suitable for secondary students was undertaken. It included (a) the analysis of career counselling rationale and current practices in the field; (b) the analysis of career counsellors' beliefs, feelings, behaviours, and attitudes towards the use of computers in career counselling; (c) the analysis of students' needs; and (d) the evaluation of CAGS currently in use in other countries.

Designing Hypermedia for CAGS

Advantages of *Hypermedia* and *Hypertext* models for CAGS were studied. Taking into account that the processing of personal, educational, and occupational information is a central element of career decision-making and that the way career decision-makers explore the world of education and of work may reveal the strategies they use to make their decisions. Then we considered hypermedia features to provide new facilities to users

to develop the decision-making process. Decisions were made in order to develop PROJECTOS in *HyperCard*.

DESIGNING PROJECTOS: CONFIGURATION AND FEATURES

General Goals

PROJECTOS is designed to help secondary students further in their career planning. It aims to facilitate the expression and the skills of career exploration, the process of career commitment, and to teach suitable pathways of planning specific decisions. In this system, the student interacts with the computer in such a way as to examine and explore his/her own interests, obtain and use relevant information, interpret predictive data, and formulate career plans. The options involve educational, occupational, and employment alternatives; the emphasis, however, is not merely the content but the process of career exploration and of career commitment.

Scope

PROJECTOS will not have much impact unless it is an integrated part of a systematic career counselling program; it will be used in the typical settings for the delivery of career counselling and guidance services (examples, secondary schools; youth, career counselling, and guidance centres in the community; and private practice). This system is being designed for use in individual career counselling, although it can be modified to be used in group counselling and with other populations.

Structure

PROJECTOS is a system of separated but interrelated sections. Although specific pathways through the system are suggested, users are allowed to explore through PROJECTOS in different ways, depending on their needs and levels of commitment at the beginning or during the experience. Users may enter the system at their points of interest and leave it whenever they wish. Users can also retain a record of their interactions with PROJECTOS and print-outs of feedbacks and summaries. The system has four sections: *Introduction, Self-assessment, Exploration, and Decision and Action Plan* (see Figure 1).

In the introduction section, the general purposes and sections of PROJECTOS as well as the few computer keys needed to use the system and recommended pathways through it are presented. The other three sections help the student to define and explore their "likes" through assessment of interests in an on-line inventory; to explore possible scenarios

relating to educational, occupational, and job opportunities; and to evaluate a small set of alternatives as well as to anticipate action.

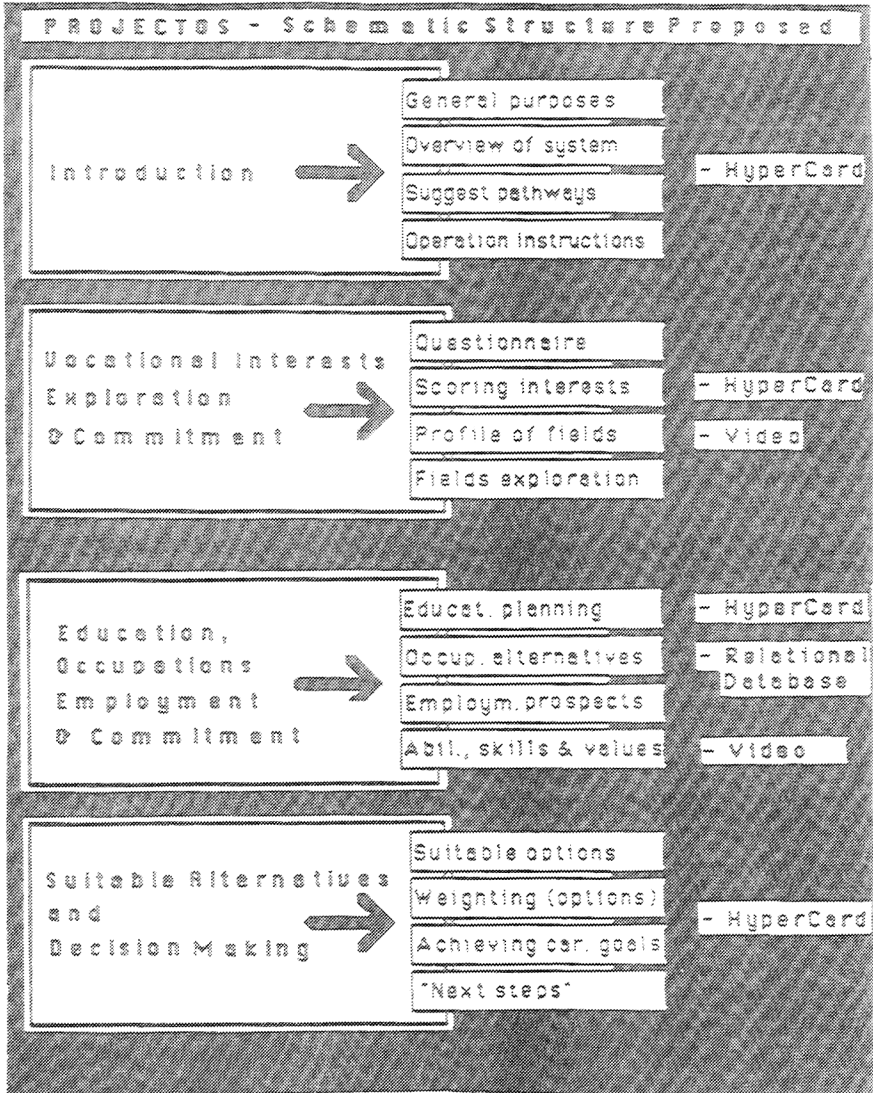


Figure 1. The four sections of the PROJECTOS system

Content, style and procedures

The content, procedures, and style of the system are under study. The content is grounded in established career development theories. The student can explore preferred interest fields from several options, each defined and illustrated on the screen (rough definition) and/or on video (detailed definition). Interests assessment can be a starting point to guide counselees in the exploration process of available alternatives. Students can, then, continue with more refined distinctions with interactive structured search of and/or direct access to information about educational, occupational and job opportunities focused on interest clusters. Finally, the system helps students evaluate their plans in terms of satisfaction, realism and commitment, and also to formulate action plans and take steps to achieve their goals.

PROJECTOS software offers a browsing environment that uses non-linear and non-sequential structures of information and may combine text, pictures, diagrams, animations, sound, live-action video, data bases, and external programs. *HyperCard* deals with hot spots — links of information which take the form of buttons, lexicons, text, graphics, that the user simply presses with the mouse to move from one topic to another. Buttons allow the user to cause other information to appear on the same screen or to move to another screen or even to take the user down specific pathways through the material. The screen is divided into working areas: an *Information Area*, an *Interactivity Action Area*, and a *Help Navigation Area* (see Figure 2).

Help Navigation Area

This includes layers of organizational structure that relieves some of the negative effects of hyperspace such as disorientation and distraction. These navigational aids can be (a) buttons that allow the access to visual schemata of the system where the topic on which the user is exploring can be outlined — a hierarchical tree; (b) buttons that link the content of the card in the screen with other topics — a key word index; (c) areas of information about the card on the screen; (d) buttons that link the user to instructions about recommendable pathways through the system; and (e) buttons of return and of arrow, etc. (see Figure 3).

Interactivity Area

This can provide access to different levels and types of information by the manipulation of buttons always present on the screen (see Figures 3, 4, and 5). These buttons can be clicked in different ways and at different moments of the exploration process.

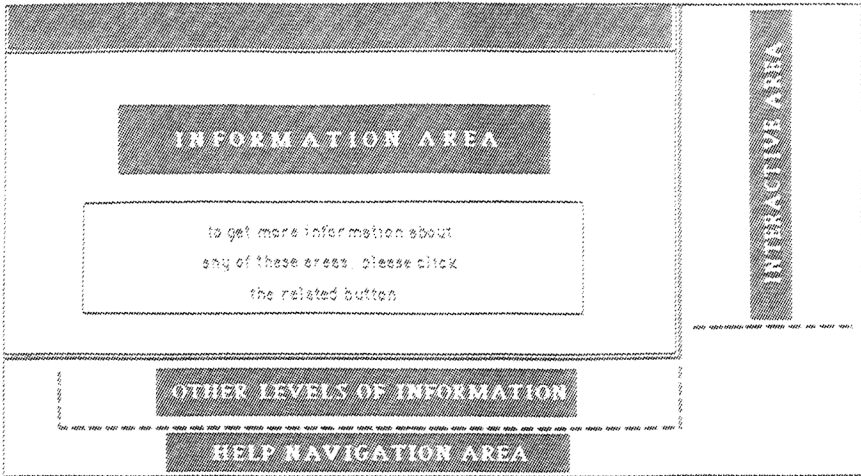


Figure 2. Screen structure of the PROJECTOS system

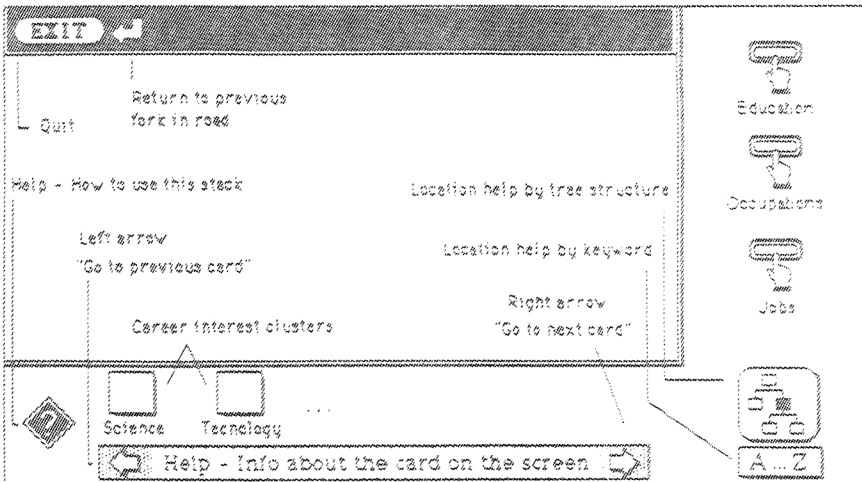


Figure 3. Buttons of the help navigation areas

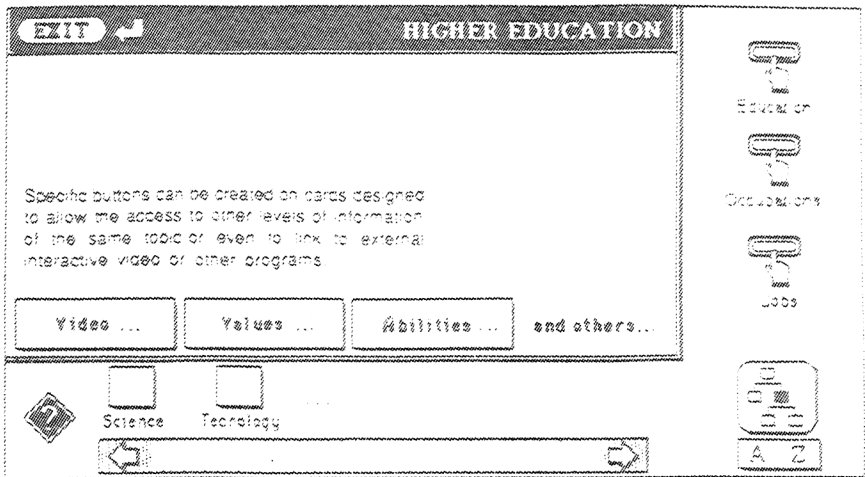


Figure 4. Example of specific buttons

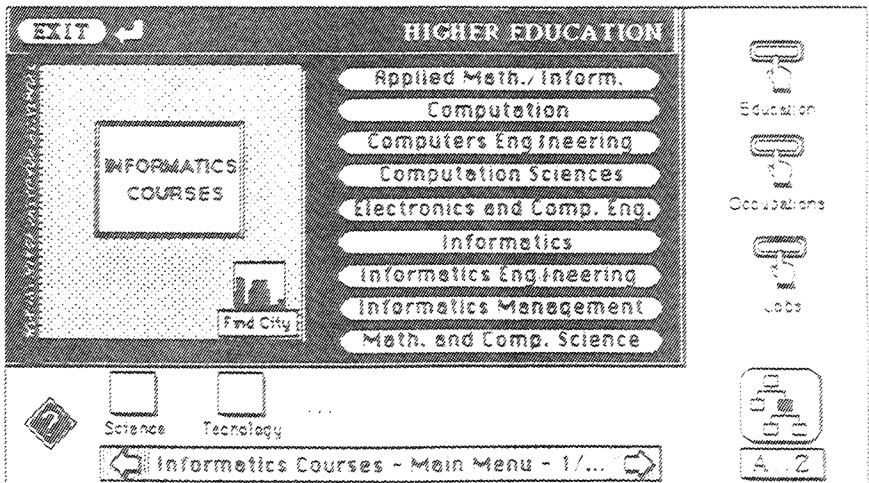


Figure 5. Example of the PROJECTOS screen

In PROJECTOS, there are interactivity buttons related with Educational, Occupational, and Employment realities. For example, students can search information on courses related to their main interest fields, and if, during this exploration activity, decisions are made in terms of commitment with some alternatives, he/she can query the system in other directions, pressing "Occupations" button and search for information about the characteristics of occupations in that field of vocational interest.

Information Area

These specific buttons can be created in the card information area to allow access to other levels and activities of exploration and to link the user to external programs and devices, broadening the range of opportunities of this kind of software (see Figure 4). The scope and depth of exploration can vary according to the different needs and dispositions of the users. The users may crosswalk through different levels and domains of information in a non-sequential way, just clicking on the preferred item associated to a button which generates an option window; but also they may choose to browse through that information using specific criteria.

For *educational planning*, they may obtain information about (a) vocational interests and field/level of education, (b) courses designation, (c) duration, (d) degrees offered, (e) institution type, (f) school type, (g) geographic location, (h) entrance requirements, (i) academic programs, (j) admission requirements to other levels of education, (k) where to find more information. For identifying occupational alternatives, they may obtain information about: (a) vocational interest fields, (b) job titles, (c) work tasks/activities, (d) work setting, (e) necessary tools and equipment, (f) personal qualities required/other requirements, (g) personal values, (h) special conditions, (i) average income, (j) promotion opportunities, (k) related educational programs/specific occupational training, (l) related military occupations, (m) where to find more information.

For employment prospects the systems offer information on: (a) employment outlook of specific occupations, (b) overview of how to develop skills required for specific jobs, (c) resumé writing and job interviewing, (d) building a network of contacts, (e) employment advertisements, (f) placement agencies, (g) where to find more information.

CONCLUSION

PROJECTOS will help users to clarify and review their own assumptions and to relate them to alternatives which may not have previously been considered. PROJECTOS offers an environment that attempts to simulate on-

line human processes of exploration and, therefore, students' exploration styles and patterns can be examined and studied, providing cues regarding the type of strategy users present in processing the information along the interaction with the system. Much of the present and future work on PROJECTOS is centred on the definition and on the implementation of strategies for collecting, processing, and storing information about career opportunities, definition of personal attributes to be included, and psychometric properties of the system.

References

- Beeman, W.O., Anderson, K.T., Baden, G., Larken, J., McLard, P.A., McQuillan, P., & Schields, M. (1987). Hypertext and pluralism: from lineal to non-linear thinking. *Proceedings of Hypertext*, 87, 67-88. Chapel Hill, NC: University of North Carolina.
- McAleese, R. (1989). Navigation and browsing. In R. McAleese (Ed.), *Hypertext: theory into practice*. London: Blackwell.
- Nielsen, J. (1990). Survey of hypertext usability. In J. Nielsen, *Hypertext and Hypermedia*. Boston: Academic Press.
- Taveira, M.C., & Campos, B.P. (1989). Novas Tecnologias de Informasao na Orientacao Vocacional. *Cadernos de Consulta Psicologica*, 5, 81-94.
- Williams, G. (1987). Hypercard. *Byte*, 109-117.

About the author

Maria Do Céu Taveira is professor of Career Counselling and Vocational Guidance, and member of the Institute of Psychological Intervention, Education and Development, at the Faculty of Psychology and Education of Porto State University, Portugal. She received her Master's degree in Adolescent Career Development and Guidance in 1987. At present, she is developing a research project about New Information Technology and Career Development. Her primary research interests and publications focus on life-span psychosocial development; in particular, youth career development and educational and community contexts. For several years she has practised counselling and psychotherapy with youngsters and adults.