

College Students with Learning Disabilities and/or ADHD Use of a Handheld Computer Compared to Conventional Planners

Betty Shrieber

contact@bettys.co.il

Kibbutzim College of Education, Tel-Aviv.

Tami Seifert

tamiseifert@gmail.com

Why a handheld computer? "Because I usually don't carry a bag...it (the HC) goes with me everywhere"

Abstract

The aim of the study is to explore the use of a handheld computer (HC) by college students with learning disabilities and ADHD, as well as its practicality as an aid to the planning and organization of learning in academia and in daily scheduling. The study describes 3 case studies tracking three students: Two of them used a handheld computer, while one student kept a conventional planner. The study's findings clearly show that the students using a handheld computer reported an increased reliance on the device compared to the other student. The device compensated for the students' organizational and memory related difficulties: the students keyed in tasks, notes, memos and especially reminders. In contrast to the interactivity of the electronic planner, the conventional planner requires the student's initiation to open it manually at least once a day to recall the written events. The handheld technology contains many other options, such as a GPS device, visual and audio recording devices, etc. These were largely not accounted for in our study. These options - as well as further handheld/cellular phone integration, might improve the organization and study processes. Continued research regarding the compensatory effectiveness of select technologies for specific difficulties should be developed.

Keywords: handheld computer/PDA, college students with learning disabilities and ADHD, learning planning and organization.

Introduction

Fluid advancements in computing technology, especially in mobile technology, has brought on the development of many and varied mobile devices and their pedagogic application. Mobile devices offer ways to complement learning and give response to practical constraint and barriers, through their unique technical characteristic of accessibility and portability. These characteristics enable effective learning organization and management (Kukulska-Hulme & Traxler, 2005). These technologies present opportunities for the learning disabled community to compensate for their disabilities in ways which were not possible, decades or even a few years ago.

The aim of the study is to explore the use of a handheld computer (HC) for college students with learning disabilities (LD) and ADHD; its practicality as an aid in daily planning and organization of learning in academia.

In recent years, an increasing number of students with learning disabilities (LD) have been studying in institutions of higher education (Heiman & Precel, 2003), however students with LD attend colleges and universities at lower rates than students without LD (Murray & Wren, 2003). In Israel, the Council for Higher Education reported in 1998 (Margalit, Breznitz, & Aharoni, 1998) that between 1.5% and 3% of university students had LD.

Planning and organizational skills are essential factors for every intellectual act (Friedman & Scholnick, 1997; Luria, 1980), they are considered to be major characteristics of Executive Functions (EF) (Gioia et al., 2002). Children and adolescents with ADHD and EF deficiencies were found to be at high risk for significant impairments in academic functioning (Biederman et al., 2004) and typically have trouble with organization and work management (Biederman et al., 2004).

Assistive technology holds great promise for helping post-secondary students with learning disabilities reach their full potential and compensate for their learning difficulties (Raskind & Higgins, 2003). Mobile technology enables storage of various types of information as well as for organization and time management.

Methodology

The study describes 3 case studies which tracked three college students with LD and ADHD during a period of 3 months: Two students used a handheld computer and one student kept a conventional planner. The three students had not previously used a planner (of any kind) consistently.

The study examines the following differences in the usage of an HC as opposed to a conventional planner: (a) The ability to use these planners regularly in their studies, as well as in their day-to-day lives; (b) Students' effectiveness in planning, organizing their studies, and controlling their time management. This study was designed to bring out the details from the viewpoints of the participants using interviews, questionnaires and tests. Data analysis is based on qualitative content analysis (Guba & Lincoln, 1981). Data collected from various sources, was examined and categorized. Categories were obtained from data relevant to the rationale of the evaluation.

Materials and Procedure

Data was collected over a three month period during weekly meetings. Students filled out daily reports regarding their everyday use of the HC/conventional planner, and were interviewed twice a week regarding their impressions and needs through use of the diary function in the HC. During those meetings, the students were given an induction session using the HC and its tools as well as guidance and how to use the planner effectively. The students were left to decide for themselves how and where they wanted to use the HC/conventional planner and for what purposes.

Data collection

A. Primary data collection regarding the students' ability of planning, organizing, time-management (in studies, work and everyday life), motivation and more:

- Self-perception questionnaire regarding planning of learning (Shrieber B.- had developed during the doctoral research).
- Primary (partially open) interview.
- Behavioral Assessment of Dysexecutive Syndrome (BADS, Emslie et al., 2003 Wilson et al., 1996, 1998;) - A neuropsychological test of executive functioning, The BADS comprises six

subtests, described in the test manual as examining a range of cognitive functions representative of executive abilities, such as cognitive flexibility, novel problem solving, planning, judgment and estimation (time judgment), and behavioral regulation.

B. Data collected during the intervention:

- Daily data report - filled out by the student.
- Once a week - an open interview.
- Once a week meeting for teaching the students a new strategy for using the HC\ conventional planner.

C. Final data collection:

- Summary (partially open) interview- was recorded with video camera.
- Self-perception questionnaire regarding planning of learning (Shrieber B.- had developed during the doctoral research)
- Behavioral Assessment of Dysexecutive Syndrome (BADS, Emslie et al., 2003 Wilson et al., 1996, 1998;) - A neuropsychological test of executive functioning, The BADS comprises six subtests, described in the test manual as examining a range of cognitive functions representative of executive abilities, such as cognitive flexibility, novel problem solving, planning, judgment and estimation (time judgment), and behavioral regulation

Findings

The study's findings show that the students who used an HC reported an increased reliance on the device compared to the other students. The device compensated for the students' organizational and memory related difficulties: the students keyed in tasks, notes, memos and especially reminders.

The practice of daily use of the diary functions in the HC vs. the conventional planner:

Diary functions were found to be different, in its variety of performance (the HC compared with the conventional planner) on one hand but on the other hand, was found to be similar in everyday use, among the 3 students, in 3 ways (see figure 1):

- a. Inserting/writing tasks (learning and others) into the diary: "*...The diary helps me to remember the daily tasks. I think it is a brilliant invention...it relieves me of all worries.* "
- b. Organizing the task using a new strategy that had been taught during the intervention time (3 months): "*...I write and mark birthdays in red, tests (like statistics test) in blue, learning tasks in green, etc...* "
- c. Time management and planning their study, work and social time as well as free time. For example:

Learning task: "*... without the HC, I used to remember up to 6 course tasks, with the HC I can remember about 14 course tasks*".

Working: "*... I took my diary (in the conventional planner) to work and opened it to see my next week's schedule, suddenly I saw that I had so many learning tasks that I asked my boss to go home...*"

Social time: "*...the diary (at the HC) saved me twice: yesterday I called my best friend to wish him a happy birthday- he was so surprised and asked me -who reminded you? ...Usually I forget his birthday*"

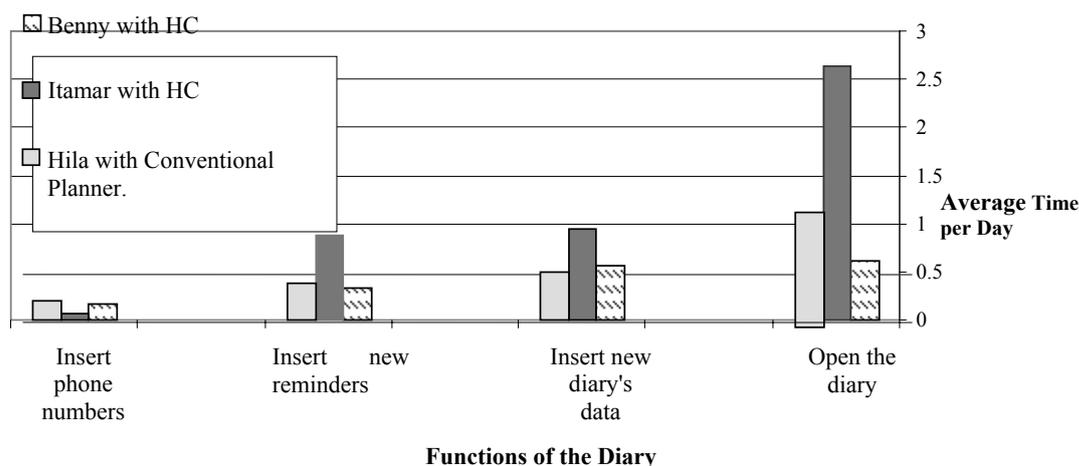


Figure 1. The habit of daily use of the diary function in the HC vs. the conventional planner

The HC's advantages over a conventional diary:

Although in both cases students can manage their time and learning, the main differences were found is **the interaction** - between the use of HC and the conventional planner:

- ◆ The reminder function raised the students' awareness of their studies and time management, also in their personal lives.
- ◆ The bleeping reminder caused “**mutual communication**” between the students and the handheld device as opposed to the conventional planner that was found to be wearisome by the student.
- ◆ The conventional planner had to be manually opened and perused at least once a day or its utility was lost, while the handheld device provided reminders at a pre-set time and date.

Along with the advantages, the students considered the PDA to complement their use of the desktop computers and their mobile phones due to its size and its abilities. The students would benefit of a faster processor and greater memory for recording lessons. In this study, the students were loaned a HC which they had to give back at the end of the process. It is of great importance for the students to own the HC in order to customize it, storing their personal content that corresponds to their particular needs.

Research Applications

The HC can be more efficient due to its wide variety of functions. Students can synchronize their HC by Bluetooth with the home computer and obtain the advantage of editing and organizing the data they gathered. They can mark the priority of the task for the reminder, set selected tasks to be repeated tasks. Students can use additional devices such as sound recorder, digital cameras to take a picture of the blackboard, calculators, MP3 devices, keyboards for lessons' summary.

With a HC students can use Windows and Office interface, surf the Internet and use GPS devices. Some of these features and functions like lesson recording, taking pictures and GPS, were not accounted for in our study due to financial and environmental restrictions such as a too small memory card. Some of them weren't used due to lack of connectivity options in the study environment for example: lesson summary. It is clear that with these options - as well as further

handheld/cellular phone integration, the organization and study processes can yet be much improved.

This study highlights the importance of weekly training during the implementation of using the HC, via two aspects:

1. Teaching planning strategy, including time management and organizing.
2. Ongoing training using the HC technology.

Research findings account for raising the students' self-esteem to the HC usage. The students felt that their friends revealed interest in their ability to operate the HC. In addition they felt that they had something which helped them remember their tasks "... *I'm throwing it (HC) the ball ...I know it will remind me, that, I can trust it...*". The usage of HC can help the students to develop self-regulation and a feeling of control. In addition, they will be considered by their friends as *cool* because they are using new generation technology.

This study will contribute to the knowledge regarding the use of the handheld device among those with learning disabilities, and its effect on organizational capabilities of this population. The study should be expanded into a larger population of students with learning disabilities and /or ADHD. Continued research regarding the compensatory effectiveness of select technologies for specific difficulties should be developed. This research should investigate the effectiveness of these technological interventions as compared to non-technological strategies (Raskind & Higgins, 2003).

References

- Biederman, J., Monuteaux, M., Doyle, A., Seidman, L., & Wilens, T. (2004). Impact of executive function deficits and Attention-Deficit/Hyperactivity Disorder (ADHD) on academic outcomes in children. *Journal of Consulting and Clinical Psychology, 72* (5), 757–766.
- Emslie, H., Wilson C., Burden V., Nimmo-Smith, I., & Wilson B., (2003). *Behavioural assessment of the Dysexecutive Syndrome (BADs)*. Thames Valley Test Company.
- Friedman, S.L., & Scholnick, E. K. (1997). An evolving "blueprint" for planning: psychological requirements, task characteristics, and social-cultural influences. In Friedman S.L. & Scholnick E.K.(Ed.), *The developmental psychology of planning : Why, how, and when do we plan?* (pp.1-21). Mahwah, New-Jersey: Lawrence Erlbaum Associates.
- Gioia, G., Isquith P., Guy S., & Kenworthy L. (2002). BRIEF: Behavior Rating Inventory of Executive Function – Professional Manual. PAR Inc.
- Guba, E. G., & Lincoln, Y. S. (1981). *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches*. San Francisco, CA: Jossey-Bass.
- Heiman, T., & Precel, K. (2003). Students with learning disabilities in higher education: academic strategies profile. (Postsecondary Education). *Journal of Learning Disabilities, 36*(3), 248-258.
- Kukulska-Hulme, & J. Traxler, J. (2005). Mobile Teaching and Learning. In A. Kukulska-Hulme & J. Traxler, J. (Eds.) *Mobile learning: A handbook for educators and trainers* (pp. 45-56). London: Routledge.
- Luria, A. (1980). *Higher cortical functions in man*. (pp. 562-588).New York : Basic Books. 2nd rev. edition.
- Margalit, M., Breznitz, Z., & Aharoni, M. (1998). *Students with learning disabilities in the higher education institutes*. Jerusalem: The Council for Higher Education (Hebrew).

- Murray, C., & Wren, C. (2003). Cognitive, academic, and attitudinal predictors of the grade point averages of college students with learning disabilities. *Journal of Learning Disabilities, 36* (5), 407-506
- Raskind, M. H., Higgins, E. L. (2003). Assistive technology for postsecondary students with learning disabilities: An overview. In S. Vogel, G. Vogel, V. Sharoni, & O. Dahan (Eds.). *Learning disabilities in higher education and beyond: an international perspective* (pp.173-199). Baltimore, Maryland.
- Wilson, B. A., Alderman, N., Burgess, P. W., Emslie, H., & Evans, J. J. (1996). *Behavioral assessment of the dysexecutive syndrome*. St Edmunds, UK: Thames Valley Test Company.
- Wilson, B. A., Evans, J. J., Emslie, H., Alderman, N., & Burgess, P. W. (1998). The development of an ecologically valid test for assessing patients with a dysexecutive syndrome. *Neuropsychological Rehabilitation, 8*, 213-228