What Can We Do To Make AAC Devices Configuration Easier?

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Topics

• Problem Statement
  – Increasing configuration complexity

• Our Portuguese AAC Tool
  – Eugénio

• Evaluation of the Configuration Interface
  – Tests, Participants, Tasks, Tools

• Results and Discussion

• Conclusions and Future Work
Problem Statement

• AAC tools are designed to meet different users’ needs and capabilities
• Many options are included...
• Difficult to configure!
Eugénio Example (1)

• Version 1
  – A very simple word predictor
  – User profiles

• 18 options only
  – Profile options
    • Interface options
    • Advanced prediction options
Eugénio Example (2)

• Version 2
  – On-screen keyboard
    • Different layouts
  – Scanning access
  – New interface settings
  – User vocabulary

• 43 options
  – Profile options
    • Interface options
      – Grouping
  • Advanced prediction options
  • Dictionaries management
Eugénio Example (3)

• Version 3
  – Pictograms
  – On-screen keyboard editor
  – Pictogram prediction
  – Sentence prediction
  – Co-construction
  – Context-awareness (time, location, speaking partner)

• 86 options
  – User profile options
    • Tabs
  – Import, Export, Pictogram Galleries, ...
  – Global options
    • Not user profile dependent
Increasing Number of Options!

- Doubles at each version
- Dialog-based interfaces may not be enough to deal with it...
  - Many ATs use it
- May be of no use if are difficult to configure!
  - AT abandonment
- So...
  - What Can We Do To Make AAC Devices Configuration Easier?
Method

• Ask users to configure a dialog-based interface
  – Eugénio
• Standard tasks
  – Create user profiles, create on-screen keyboards, ...
• Get configurators feedback
  – Difficulties, improvement suggestions
• Analyze and categorize feedback
  – To improve the configuration interface
Participants

• 23 Rehabilitation Professionals
  – Cerebral Palsy Center of Beja
  – School Clusters n.º 2 of Beja
  – School Clusters n.º3 of Beja

• Speech therapists, occupational therapists, school teachers
  – Different levels of expertise
Procedure

• Four-module training course
• In each module
  – Participants learned how to perform typical tasks
  – Later had to perform similar task on their own
    • Submit difficulties and suggestions
• At the end of each module
  – Questionnaire
• After development of real AAC solutions
  – Questionnaire
Training Course Modules

• Module 1
  – User profiles management
  – Basic communication boards

• Module 2
  – Advanced communication boards

• Module 3
  – Importing and exporting data
  – Speech synthesis, vocabulary prediction and scanning access configuration

• Module 4
  – Location, time and speaking partner awareness
Task Example

1. Create a communication board with the following structure and name it Cafeteria.
   a. Adjust the size of the keys.
   b. Set the keys output to text. Test it.
   c. Set the keys output to pictogram. Test it.
   d. Adjust the editing area.

<table>
<thead>
<tr>
<th>Coffee</th>
<th>Juice</th>
<th>Cake</th>
<th>Chocolate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toast</td>
<td>Soup</td>
<td>Water</td>
<td>Ice-Cream</td>
</tr>
<tr>
<td>Candies</td>
<td>Pie</td>
<td>Sandwich</td>
<td>?</td>
</tr>
</tbody>
</table>

Eugénio with ARASAAC pictograms (designed by Sergio Palao to CATEDU)
Configurators Feedback

• Collect user feedback from each dialog-box
  – R button
• General feedback also possible
  – Menu option
Collected Data

- **Session Data**
  - user profiles, on-screen keyboards, ...

- **Session screencast**
  - Screen recording

- **Configurators feedback and navigation**
  - Log file
    - menus and dialog-boxes opened
    - user feedback

- **Questionnaires**
  - Post-Task and Post-AAC Solutions Development

```xml
...<MENU>
<ID>32899</ID>
<SELECTION_TIME>2012:03:20:19:57:26</SELECTION_TIME>
</MENU>

<USER_FEEDBACK>
<USER_DIFFICULTY>3</USER_DIFFICULTY>

<USER_SUGGESTION>
Ponderar a possibilidade de criar um modo de "copiar" a última acção efectuada. Por exemplo, temos todas as teclas com saída de texto em escrita e queremos alterar para pictograma. Criar um modo de o fazermos numa primeira tecla e depois generalizar para as outras sem ser necessário passar por todo o processo em cada tecla.
</USER_SUGGESTION>
</USER_FEEDBACK>
...```
FEEDBACK DURING TASK EXECUTION
Configurators Feedback

• 39 suggestions or difficulties
• Most of the times dialog boxes were not scored
  – Not Applicable (21)
• Dialog scores
  – Easy (9)
  – Medium (8)
  – Difficult (1)
Feedback During Task Execution

- More feedback in first modules
  - New tool, most obvious problems, task familiarity
- Top 5
  - Task 1.3 (9)
    - Basic on-screen keyboard management
  - Task 2.2 (7)
    - Advanced on-screen keyboard management
  - Task 1.2 (6)
    - Basic user profile configuration
  - Task 2.1 (4)
    - Prediction keys management

Reported Suggestions or Difficulties Per Task

- Task 1.1 5%
- Task 1.2 15%
- Task 1.3 23%
- Task 1.4 3%
- Task 2.1 10%
- Task 2.2 18%
- Task 2.3 2%
- Task 3.1 3%
- Task 3.2 3%
- Task 3.3 3%
- Task 4.1 3%
- Task 4.2 5%
- Task 4.3 5%
- Task 4.4 3%
What Did Configurators Say! (1)

• **Small bugs and insufficient or missing functionality**
  – Possibility to change the on-screen keyboard’s name (2)
  – Correct the min and max values for vocabulary prediction (1)
  – Possibility to center text in keys (1)
  – Correct adaptation of labels' size to the width of keys (1)
  – Make access to keys' properties faster (2)
  – Improve navigation in the message editing area (1)

• **Would be better to manipulate objects directly**
  – Drag and drop keys (2)
  – Drag and drop user profiles (1)

Drag-and-drop keys not available
What Did Configurators Say! (2)

• **Some language corrections**
  – Correct the name of a key's property (6)
  – Correct the name of a on-screen keyboard's property (1)

• **Difficulties identifying available options and active elements**
  – Hide and show available options according to context (1)
  – More feedback about which is the active on-screen keyboard (1)
  – More feedback about which is the active user profile (1)

Active profile and on-screen keyboard
What Did Configurators Say! (3)

• **Perform automatic operations**
  – Whenever possible fill keys' options automatically (1)
  – Applying the same action to several keys (7)
  – Applying the same action to several days of the week (6)

• **Interactive help**
  – Assistance configuring keys' properties (1)

Copy the same time to several days of the week
POST-TASK QUESTIONNAIRES
What Did Configurators Say! (4)

- **Small bugs and insufficient or missing functionality**
  - Recover deleted user profiles (1)
  - Correct adaptation of labels' size to the width of keys (1)

- **Difficulties making associations between solution’s elements**
  - Difficulties associating a user profile to speaking partners mobile phones (1)
  - Difficulties associating a user profile to the indoor location devices (1)
  - Associating a user profile to a certain time/day of week is easier because there are no external devices involved (1)

Associating a profile to a speaking partner mobile phone
What Did Configurators Say! (5)

- **Stronger visual representation of solution’s elements**
  - Visual presentation of user profiles' options and configuration (1)
  - Visual presentation of on-screen keyboard's options and configuration (1)
  - Associate images to user profiles and on-screen keyboards (1)

- **Perform automatic operations**
  - Whenever possible fill keys' options automatically (1)

Opening an on-screen keyboard
What Did Configurators Say! (6)

• Difficulties importing resources from third-party applications
  – Incorporate pictogram resources to avoid working with two different programs (1)

• Long task sequences
  – Needs a long sequence to assign a user profile to a specific indoor location (1)
  – Needs a too long sequence to assign a user profile to a specific speaking partner (1)

Eugénio & Picto Selector (Martijn van der Kooij)
What Did Configurators Say! (7)

- Small bugs and insufficient or missing functionality
  - Decrease adaptation time in indoor settings (2)
  - Turn speech synthesis faster (1)
  - Better adjustment of images inside the keys (1)
- Links to external resources
  - Link to other programs (1)
  - Connection to Internet resources (1)
- Visual representation of elements and aesthetics
  - Turn the configuration interface more visual (1)
  - Turn the interface more attractive (1)
- Configuration issues
  - Difficult to configure due to the quantity of options (1)
  - Create a configuration manual (1)
What Configurators May Want...

- Elements presented visually
- Relations between elements
  - Users, profiles, components
- Configurators say which components to configure
Conclusions

• Evaluated the dialog-based interface of Eugénio
• Identified difficulties configuring a dialog-based interface for AAC
• Identified principles to construct better configuration interfaces
Future Work

• Design a configuration interface that follows identified principles
  – New tests with the support of SUPERA (AT Portuguese Association)

• Deeper analysis of other system’s configuration interfaces

• Taxonomy that groups and presents configuration properties for AAC
  – Collaboration with other research groups

User

Profile

Name

Context

Components

On-Screen Keyboard

Speech-Syntesis

Scanning Access

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Thank You!

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