



This presentation is part of the COGAIN Deliverable D3.4

Eye Control Hints and Tips

by

the Network of Excellence on
Communication by Gaze Interaction

www.cogain.org

*(Please click on speaker icon on each page
to hear the presentation)*



Which software can we use for Eye-Control?

Assessment and Implementation.

An Introduction.

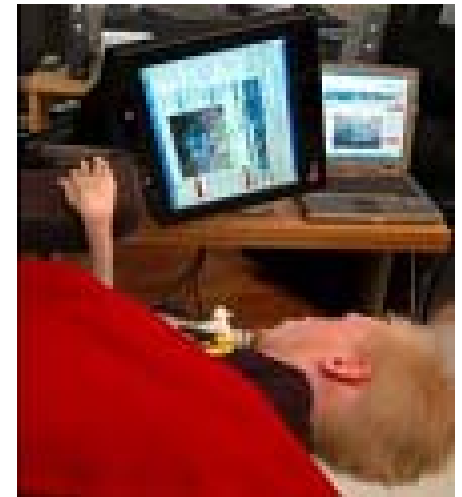
This presentation...



1. Software for Introducing Eye Control
2. Software for Communication and Control
 - software included within the eye control system
 - 'off the shelf' software
 - 'framework' software



... Bjorn Andre can use eye control easily...



1. Software for Introducing Eye Control



Non-challenging

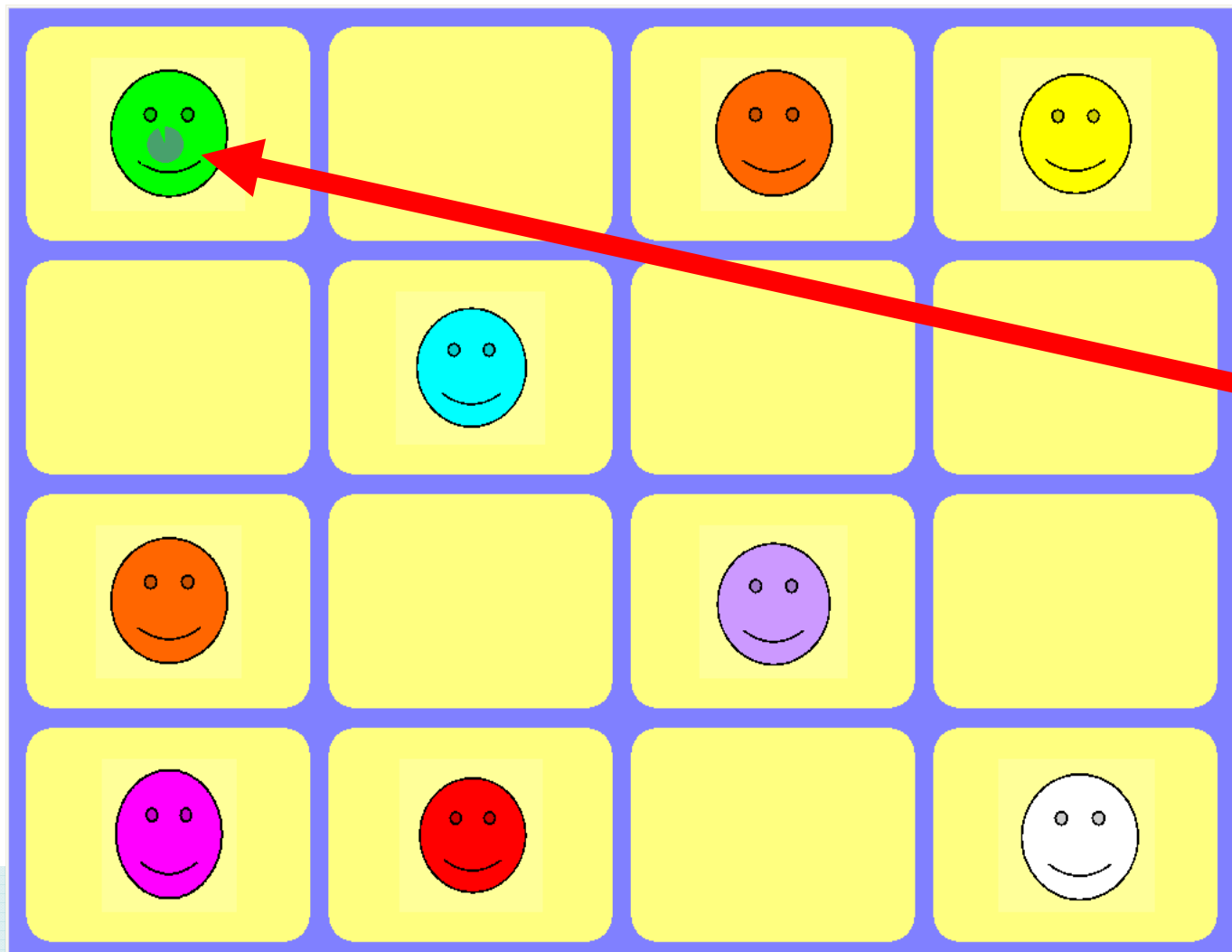
Age, ability and interest related



Helen



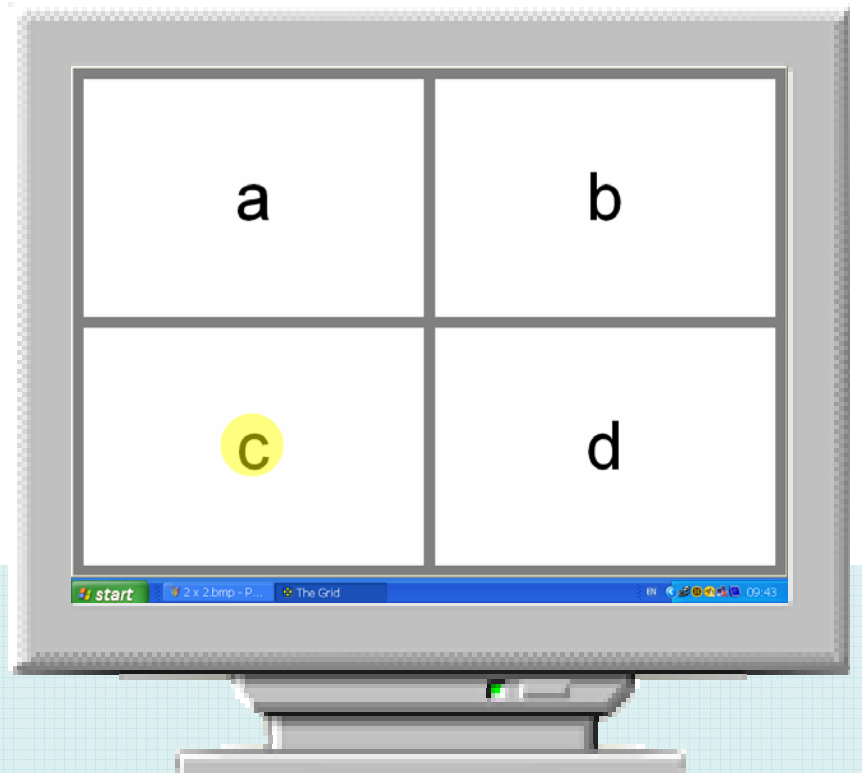
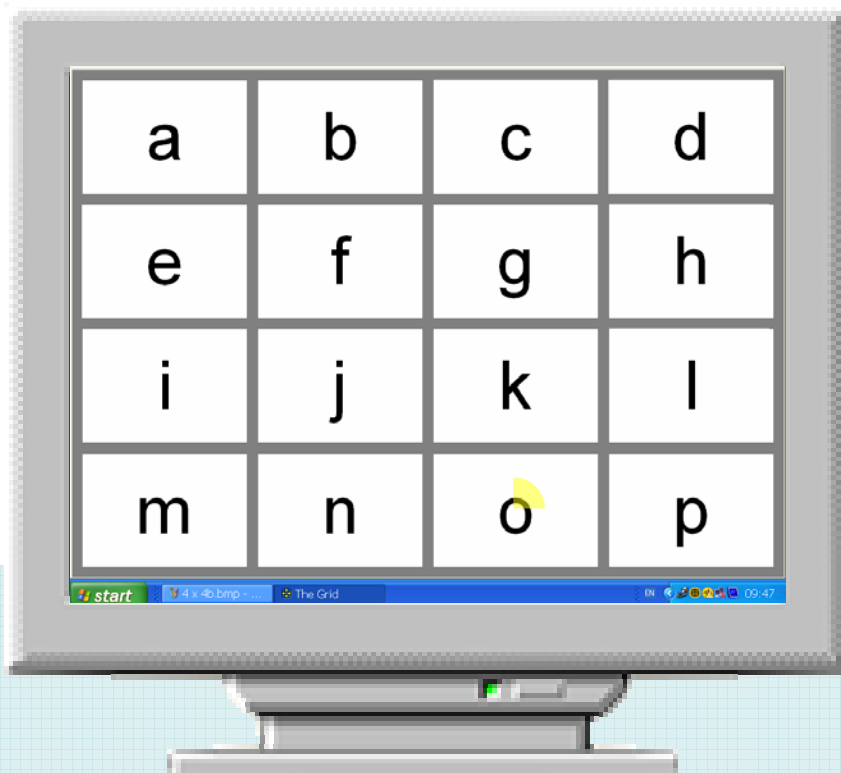
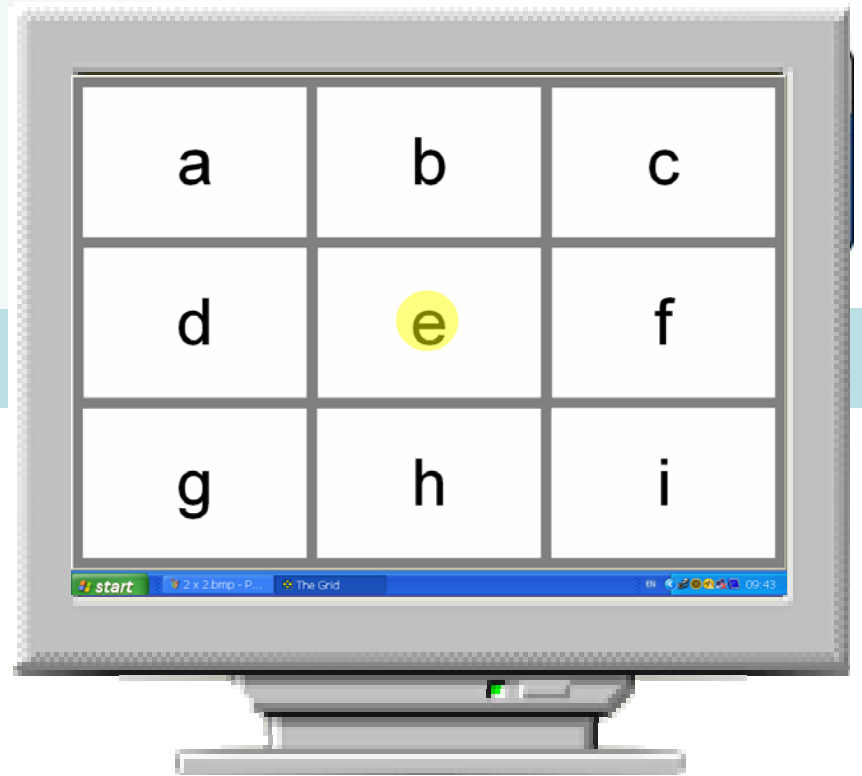
'Stick a nose on the face'...



A grey
'nose'

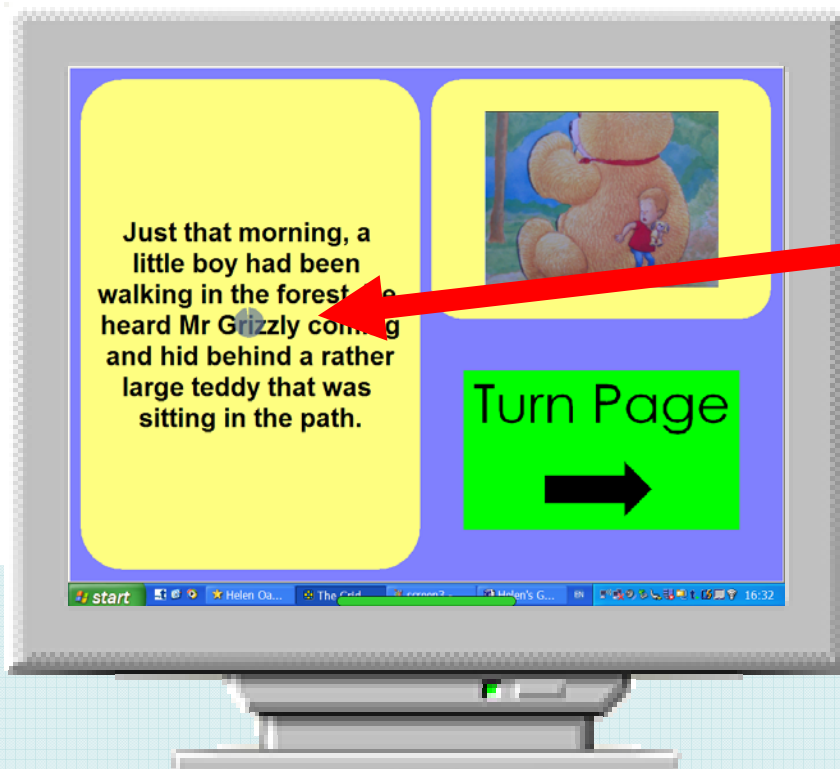
Playing music with eye control





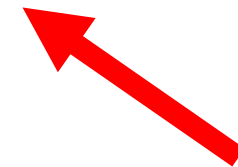


An 'active' cell



A 'non-active' cell

Helen



*(Please click
on the picture
to play the
video)*

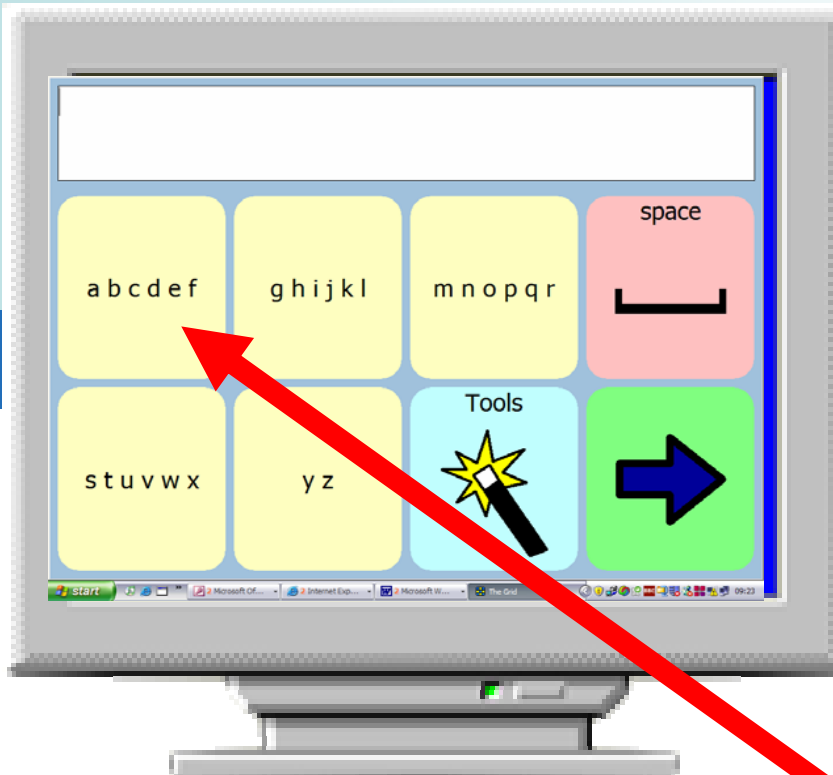
[Click here to play this video from web](#)

Going shopping...



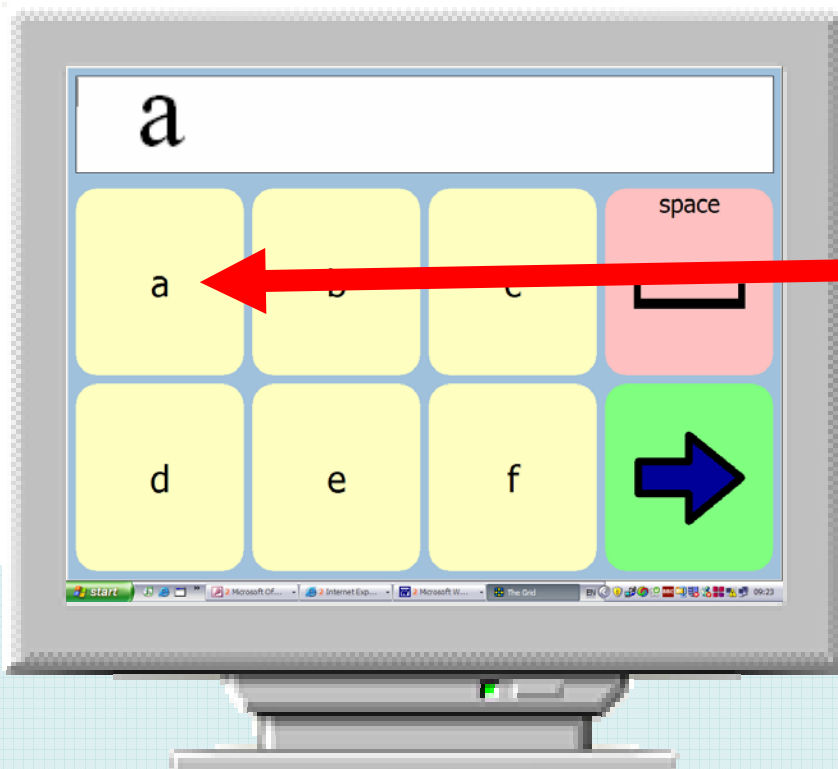
Writing with whole words and phrases...



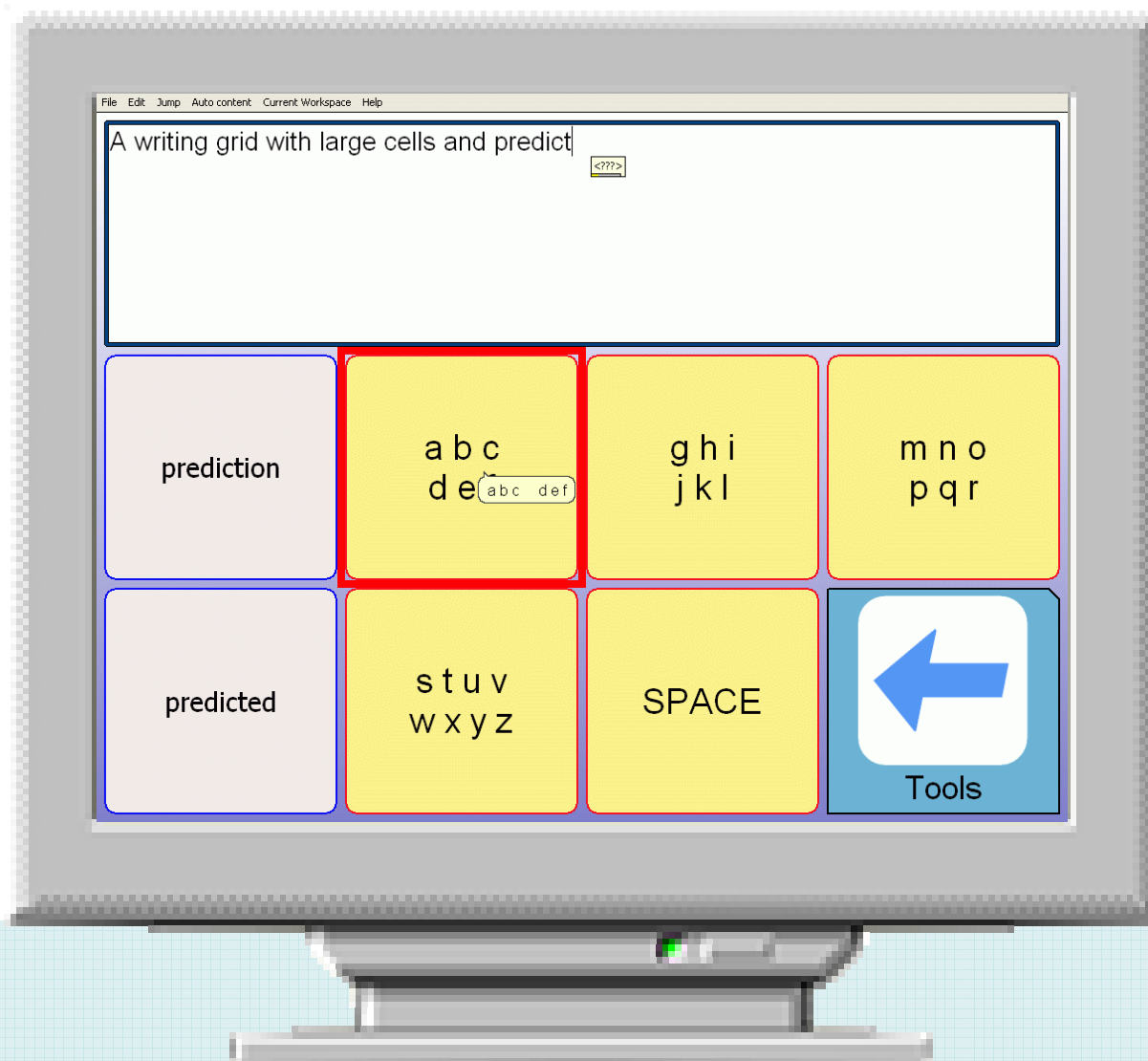


To write the letter 'a'
in two steps...

1. Select the 'a-f' cell.
2. Select the 'a' cell.



Using prediction with the '2' hit method...



2. Software for Communication and Control



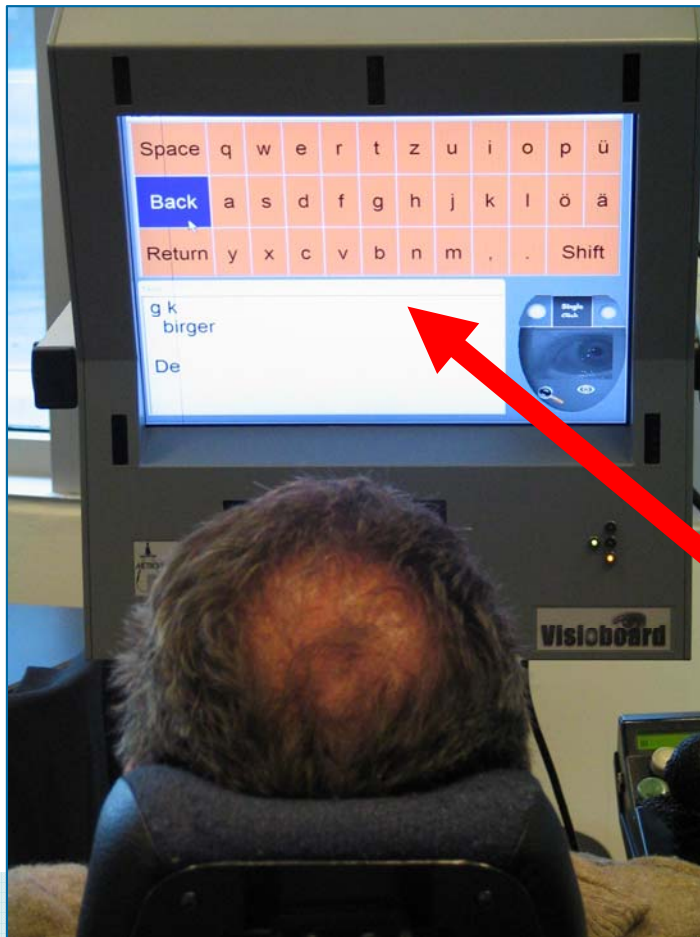
- (a) included within the system
- (b) off the shelf
- (c) framework software

2(a) Software included with the system



The Erica system's on-screen Keyboard

2(a) Software included with the system



mouse control

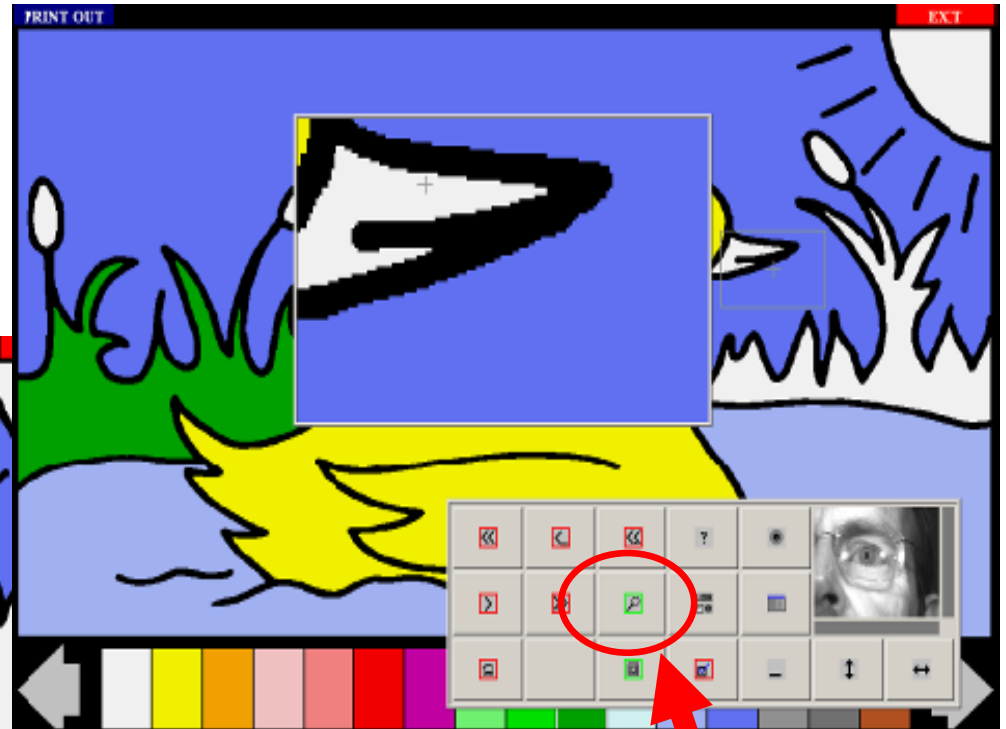
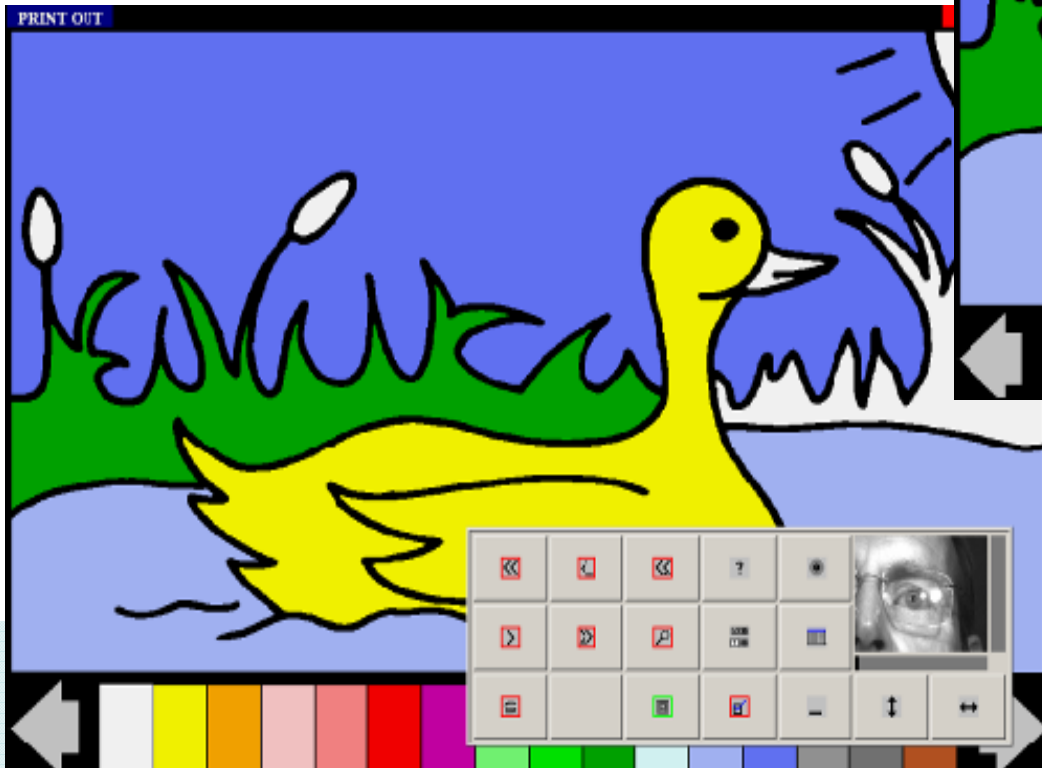
magnifier

The Visioboard system's on-screen keyboard

2(a) Software included with the system



Magnification on Quick Glance 3...



magnifier

2(a) Software included with the system



```
Dear Uncle Charlie,
It was good to see you last week. I tried to call you on the phone yesterday
but the line was busy. I'll call again tomorrow.

```

ESC	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	OUT
'	1	2	3	4	5	6	7	8	9	0	Prt	Pse	SPK
CTL	ALT	q	w	k	j	y	p	<-BACK	NLk	/	*	-	
TAB	SL	u	t	h	e	r	l	ENT	Hom	^	PgU		+
	SHF	f	s	SPACE	n	g	SHF	<-	PSE	->			
\	/	c	d	o	a	i	m	[]	End	∨	PgD	ENT
;	'	,	z	x	v	b	.	-	=	INS	DEL		

Eye-typing with LC Eyegaze

2(a) Software included with the system



Conversation			
Hello	Good Bye	Good to see you	Where have you been
How have you been?	I've missed you	I'm Happy!	I'm Sad
I need a Hug	Good	I like that	Talk to me
Yes	No	Pause	Menu

Quick communication

2(a) Software included with the system



Lights & Appliances

Lamp	Chime	Music	Fan
on	on	on	on
off	off	off	off
Radio	Desk Lamp	TV	Front Door
on	on	on	on
off	off	off	off
			EXIT

Environmental control

2. Software for Communication and Control

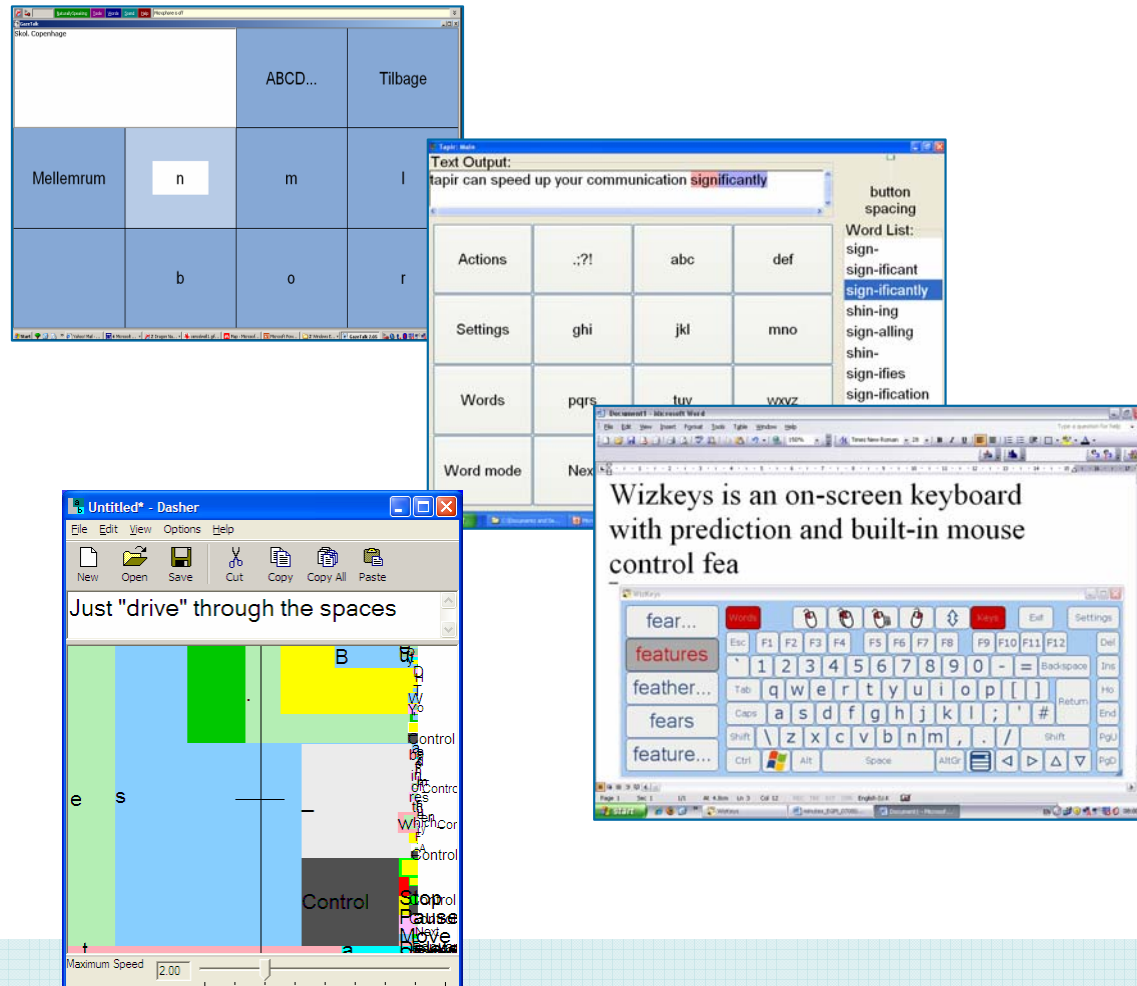


- (a) included within the system
- (b) off the shelf
- (c) framework software

2(b) 'Off-the-shelf' eye control software



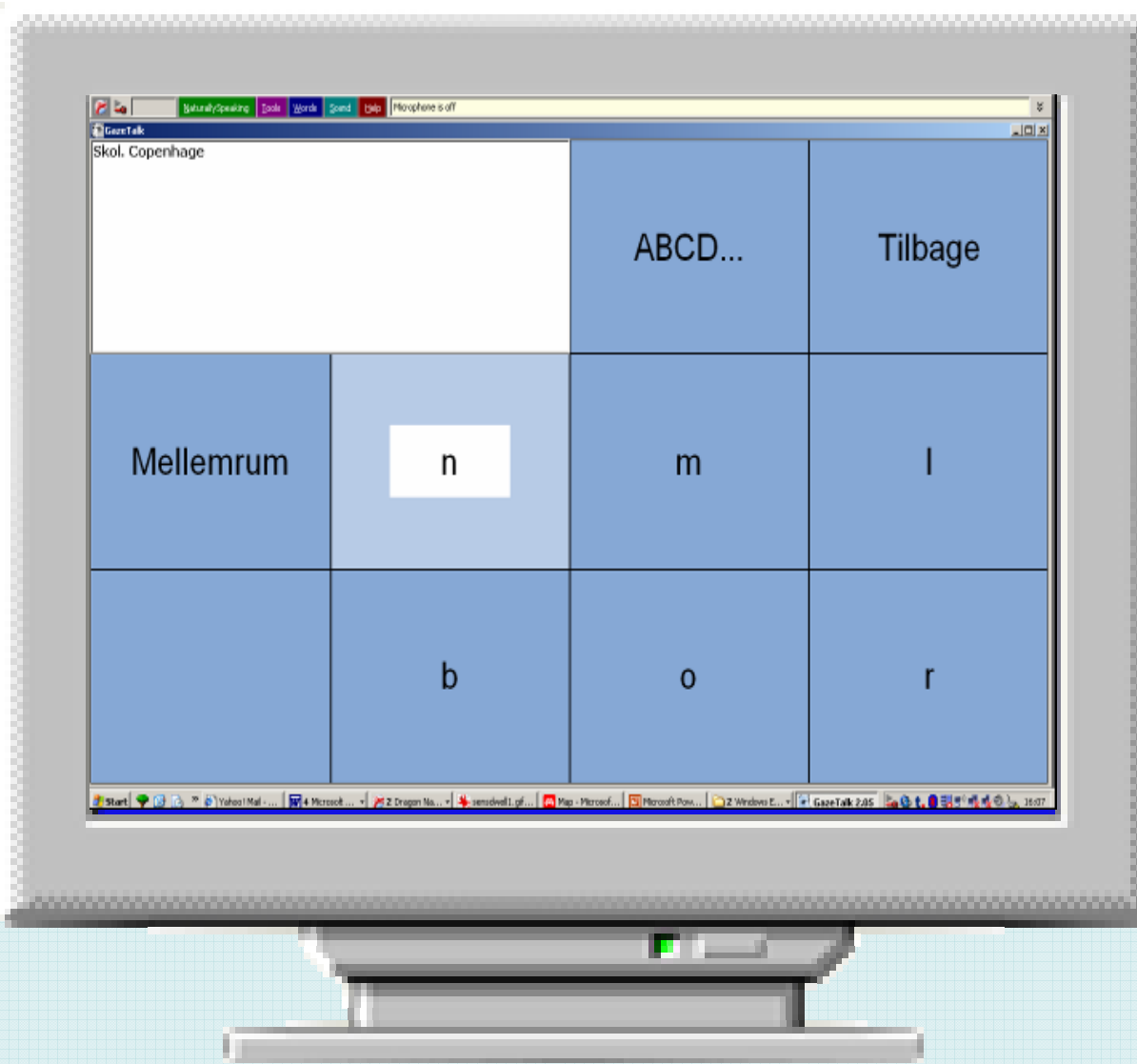
- GazeTalk
- Tapir
- Wizkeys
- Dasher



The image displays three screenshots of eye control software interfaces:

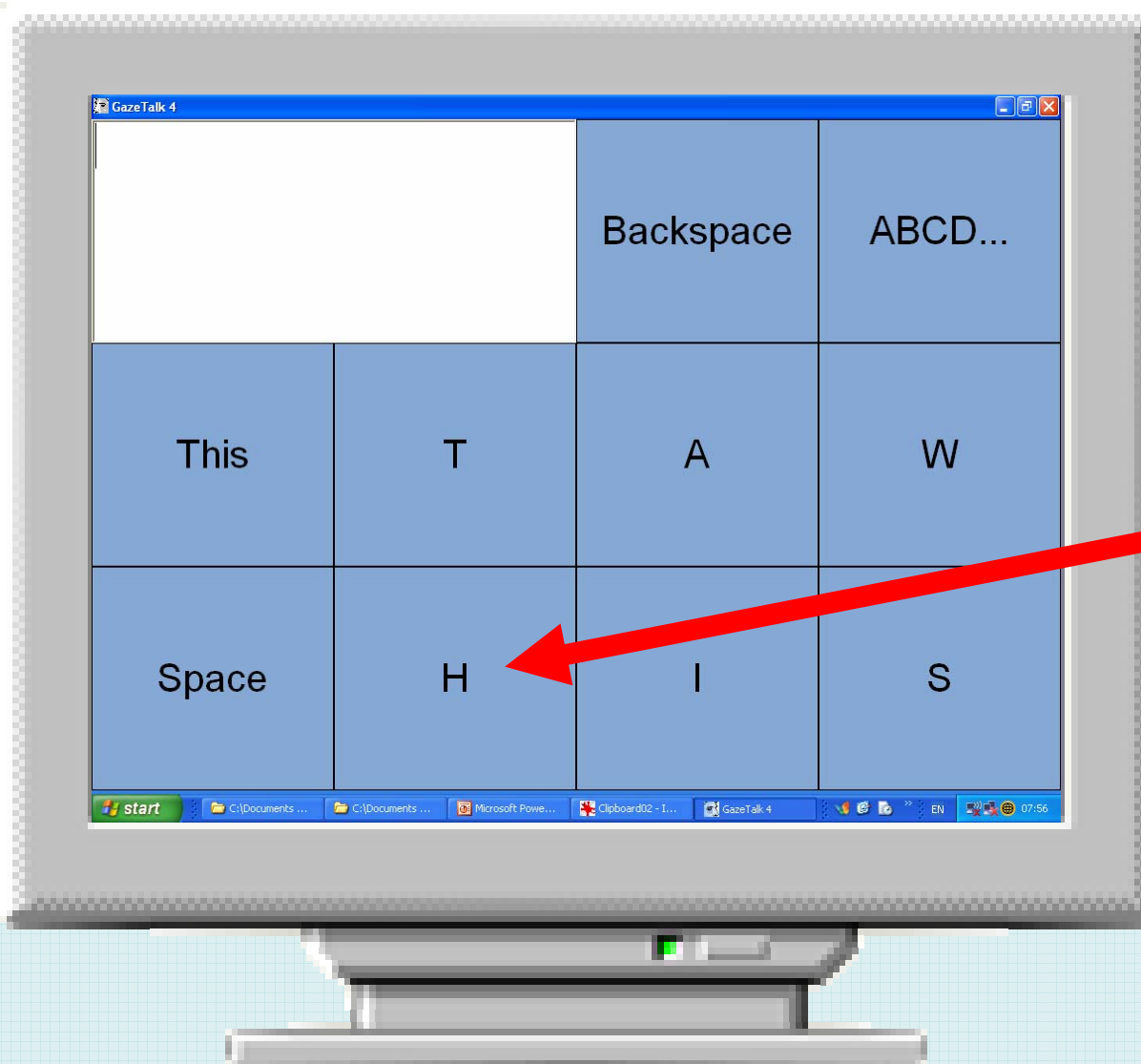
- Tapir:** A window titled 'Tapir - Main' showing a 'Text Output' area with the text 'tapir can speed up your communication significantly'. Below the text is a grid of 'Actions' (.,?!), 'Settings', 'Words' (ppqr, tuv, wxyz), and 'Word mode'. A 'Word List' on the right includes 'sign-ificantly', 'shin-ally', and 'sign-ification'.
- Wizkeys:** A window titled 'Wizkeys' showing an on-screen keyboard with a 'Wizkeys' toolbar at the top. The toolbar includes a 'Wizkeys' button, a mouse cursor icon, a 'Wizkeys' button, and an 'Exit' button. The keyboard has a 'Wizkeys' button on the left and a 'Wizkeys' button on the right. The text 'Just "drive" through the spaces' is visible in the background.
- Dasher:** A window titled 'Untitled* - Dasher' showing a 'Dasher' interface with a 'Dasher' toolbar at the top. The toolbar includes a 'Dasher' button, a 'Dasher' button, and a 'Dasher' button. The text 'Just "drive" through the spaces' is visible in the background.

2(b) 'Off-the-shelf' eye control software - GazeTalk



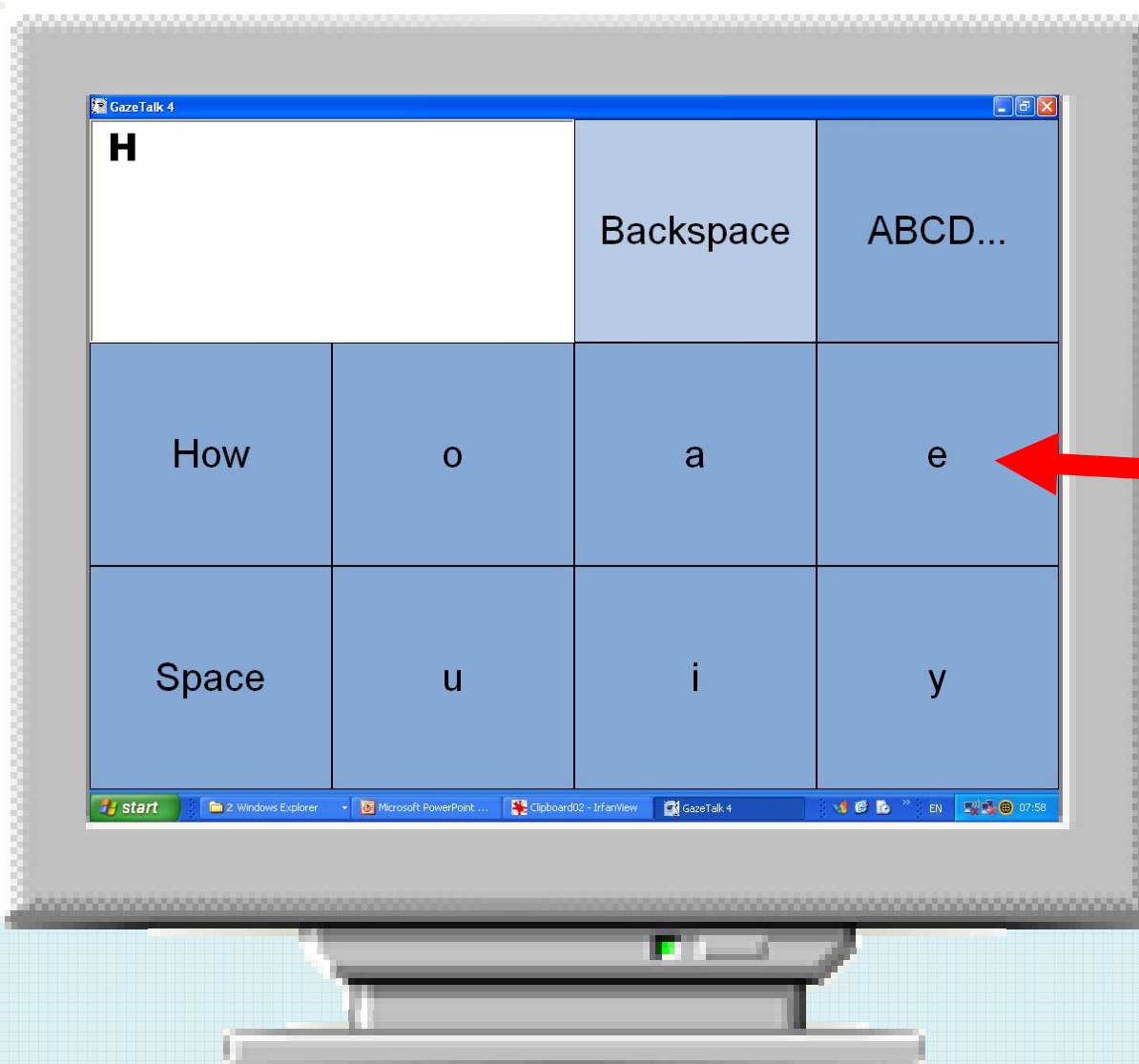
GazeTalk provides a range of options, including writing, email, web browsing, playing media files, etc.

2(b) 'Off-the-shelf' eye control software - GazeTalk



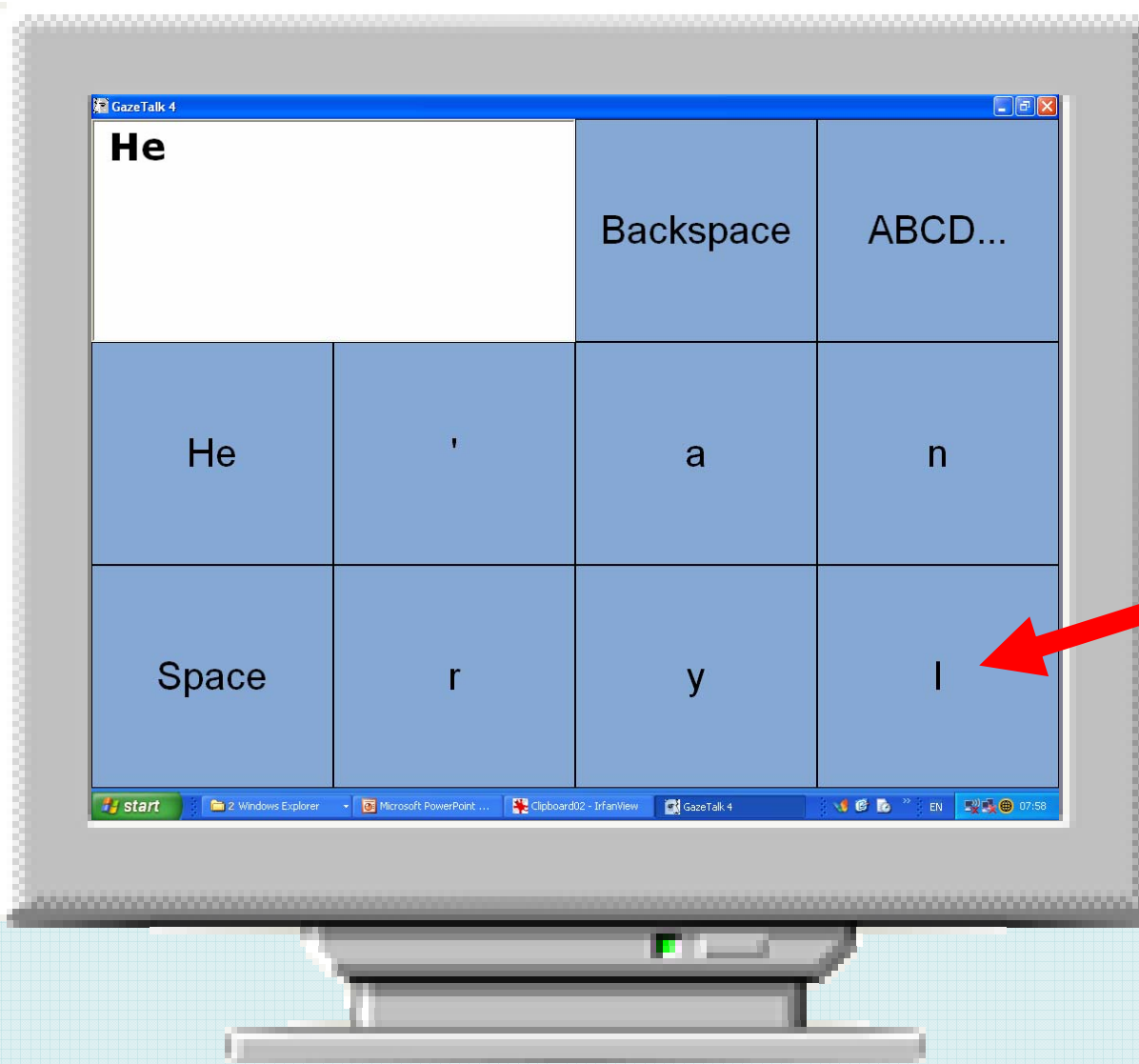
To write 'Hello', first
select the letter
'H'...

2(b) 'Off-the-shelf' eye control software - GazeTalk



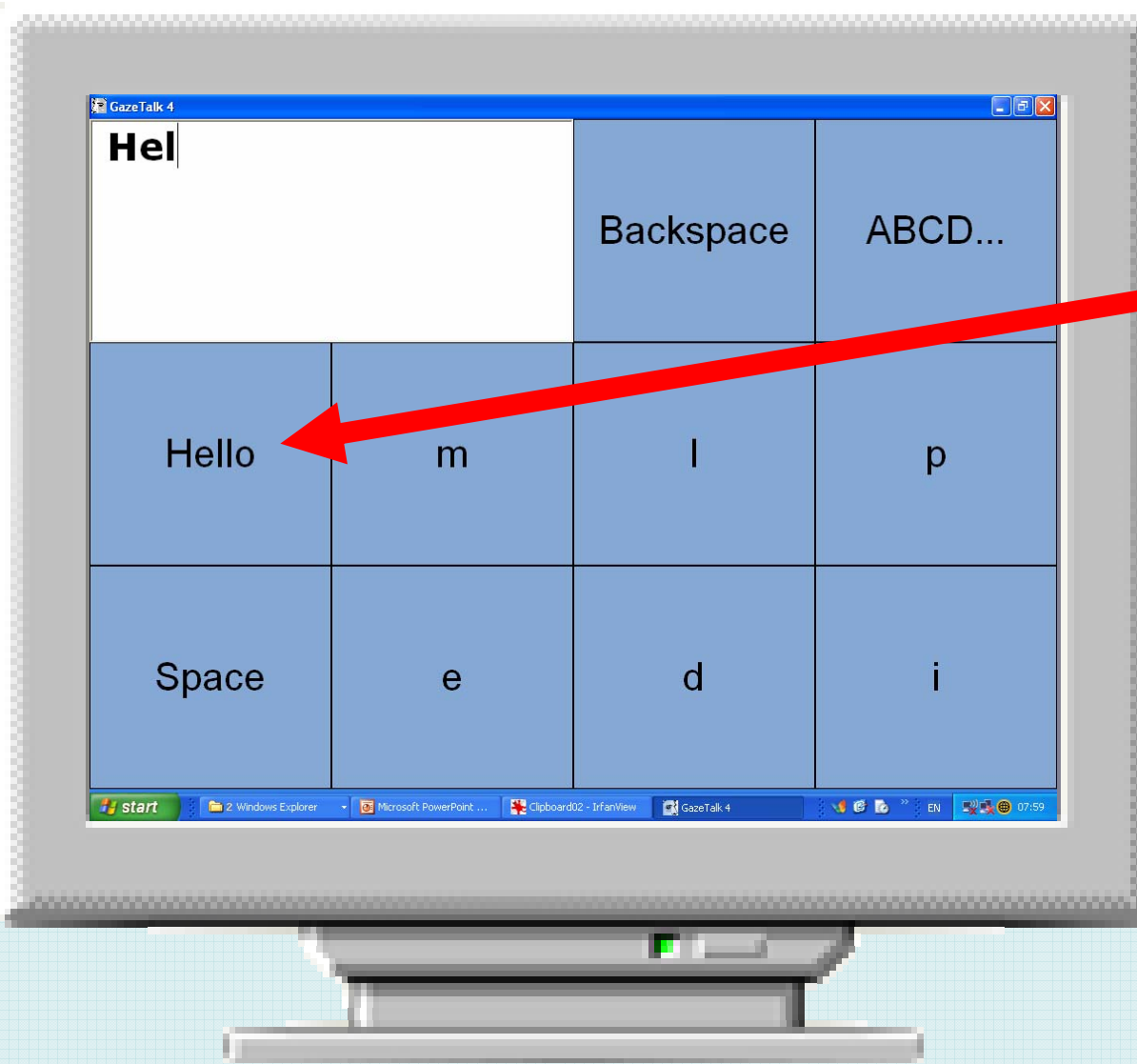
As a result of typing the letter 'H', the letter 'e' is one of the choices available, so this is selected.

2(b) 'Off-the-shelf' eye control software - GazeTalk



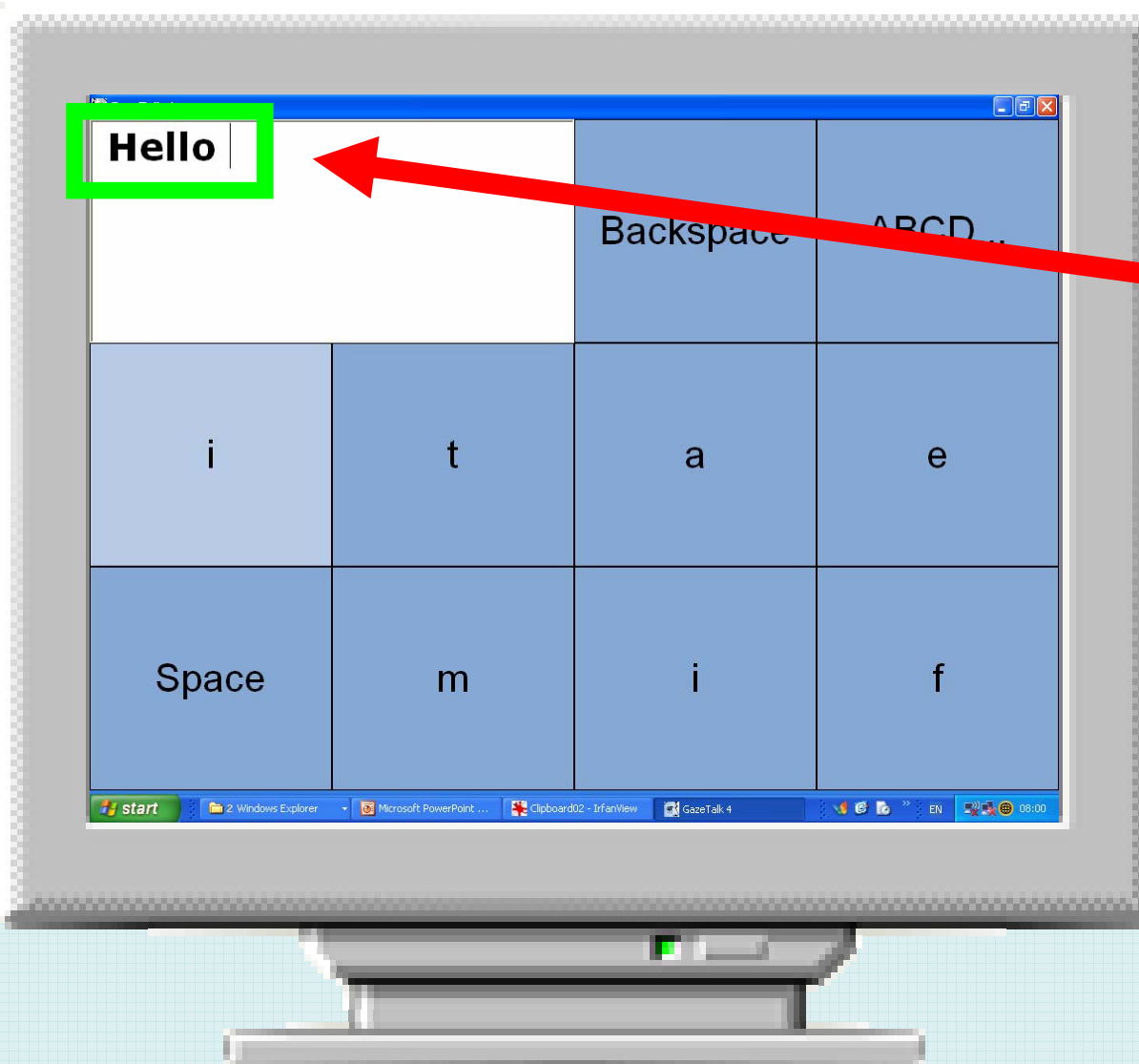
The letter 'l' is then selected.

2(b) 'Off-the-shelf' eye control software - GazeTalk



As a result of
typing the letters
'Hel'... the word
'Hello' is offered as
a prediction

2(b) 'Off-the-shelf' eye control software – GazeTalk



Once the word
'Hello' is selected,
it is sent to the text
box

2(b) 'Off-the-shelf' eye control software - Tapir



The screenshot shows the Tapir software interface. At the top, a window titled 'Tapir: Main' contains a 'Text Output:' field with the text 'tapir can speed up your communication significantly'. Below this is a grid of buttons for navigation and input. To the right, a 'Word List:' is displayed with 'sign-ificantly' highlighted.

Actions	.;?!	abc	def
Settings	ghi	jkl	mno
Words	pqrs	tuv	wxyz
Word mode	Next	Space	Delete

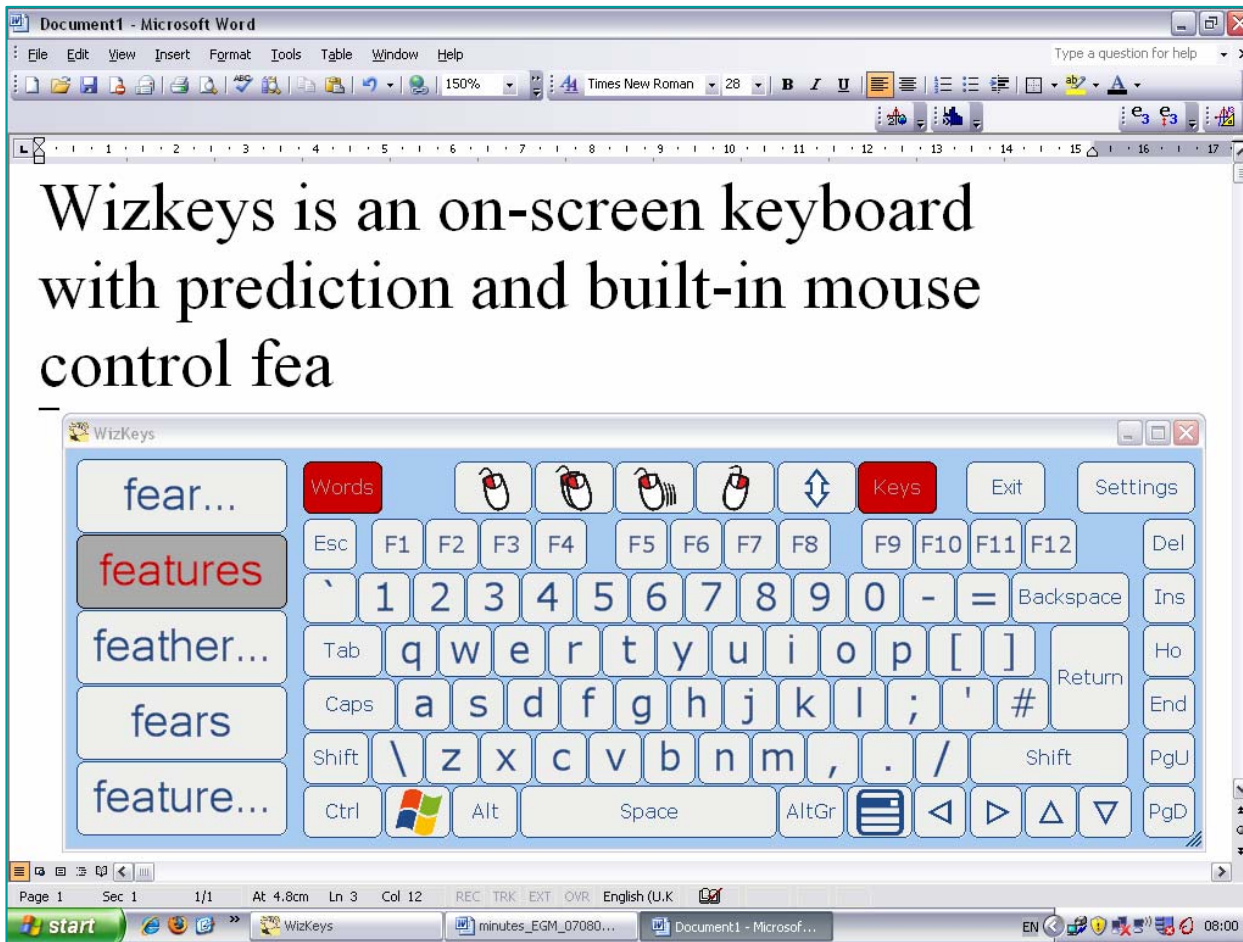
Word List:
sign-
sign-ificant
sign-ificantly
shin-ing
sign-alling
shin-
sign-ifies
sign-ification
sign-ifications
sign-ificatory

Tapir...
disambiguation
combined with
prediction

2(b) 'Off-the-shelf' eye control software - Wizkeys

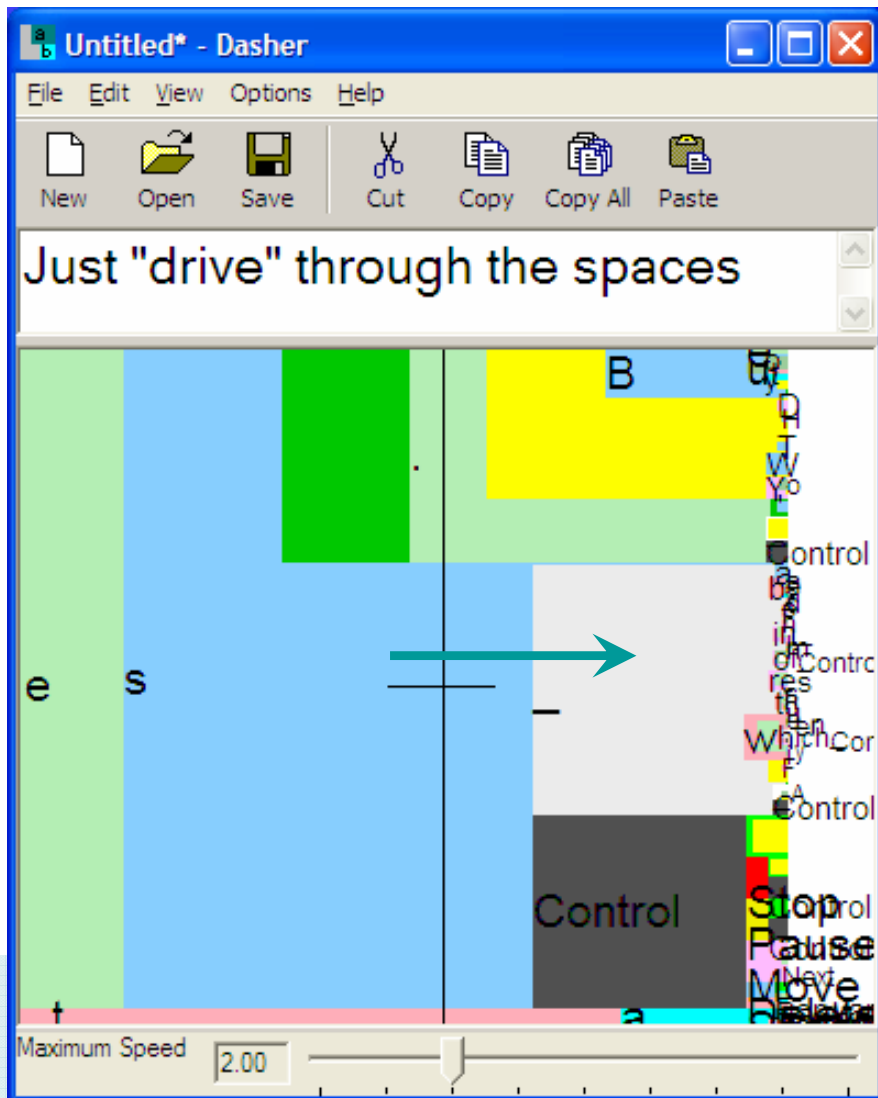


Wizkeys is an on-screen keyboard with prediction and built-in mouse control fea



Wizkeys provides prediction and mouse utilities, if required, and can be resized.

2(b) 'Off-the-shelf' eye control software - Dasher



With Dasher, text is generated simply by 'steering' through the letters.

2. Software for Communication and Control



- (a) included within the system
- (b) off the shelf
- (c) framework software

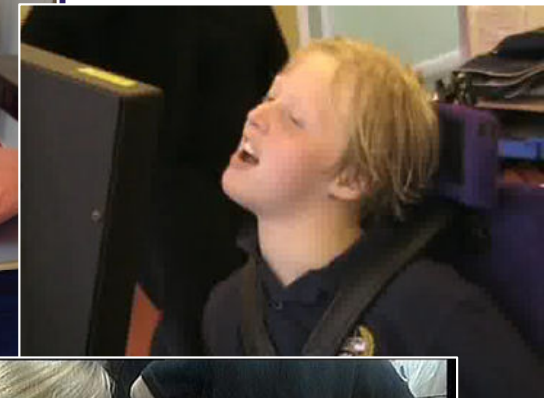
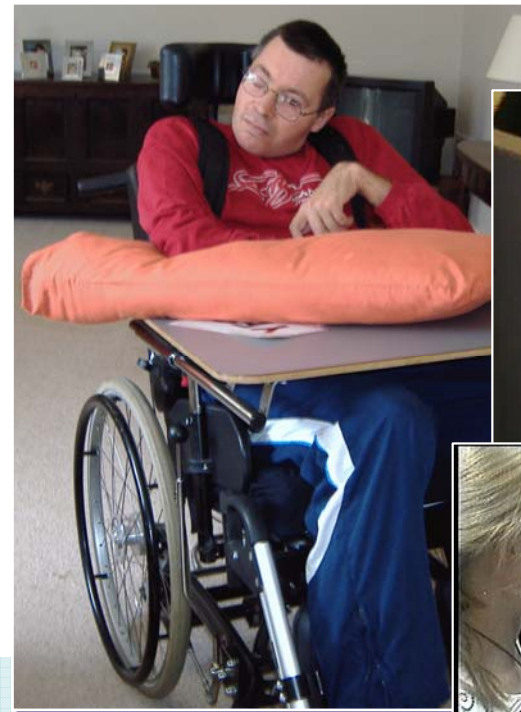
2(c) Framework Software



All of these people have...

Visual difficulties and/or
Involuntary head movement

They need customisable,
'framework' software



Michael



Stroke

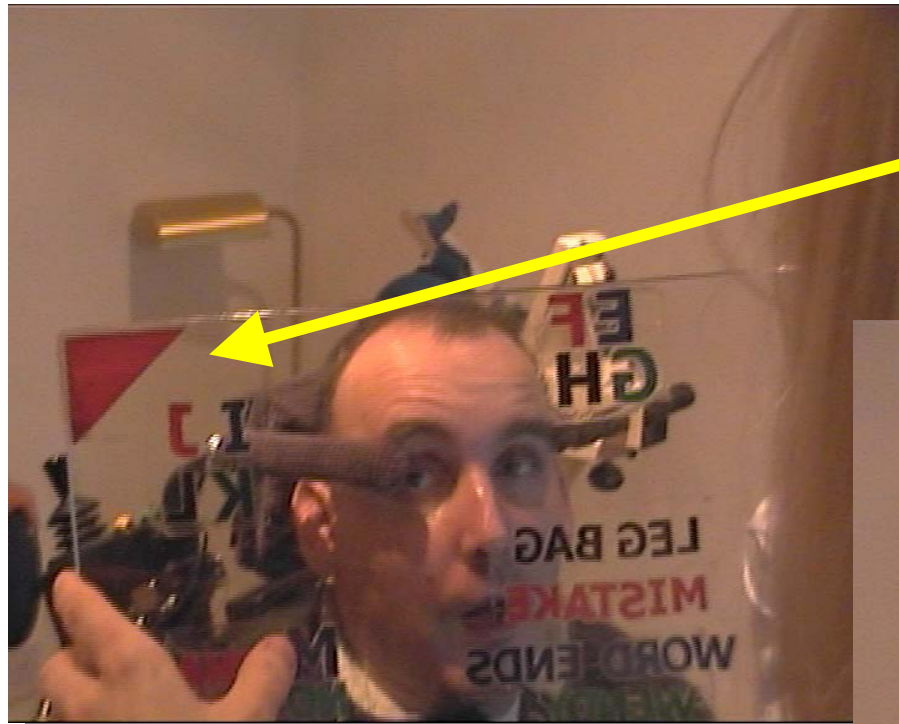
Intelligent, well motivated

Head switch - environment &
wheelchair

Wants something quicker and
easier



Michael



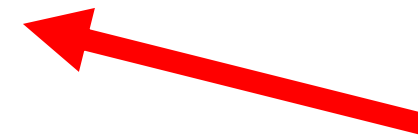
Selecting the letter 'F'



Michael



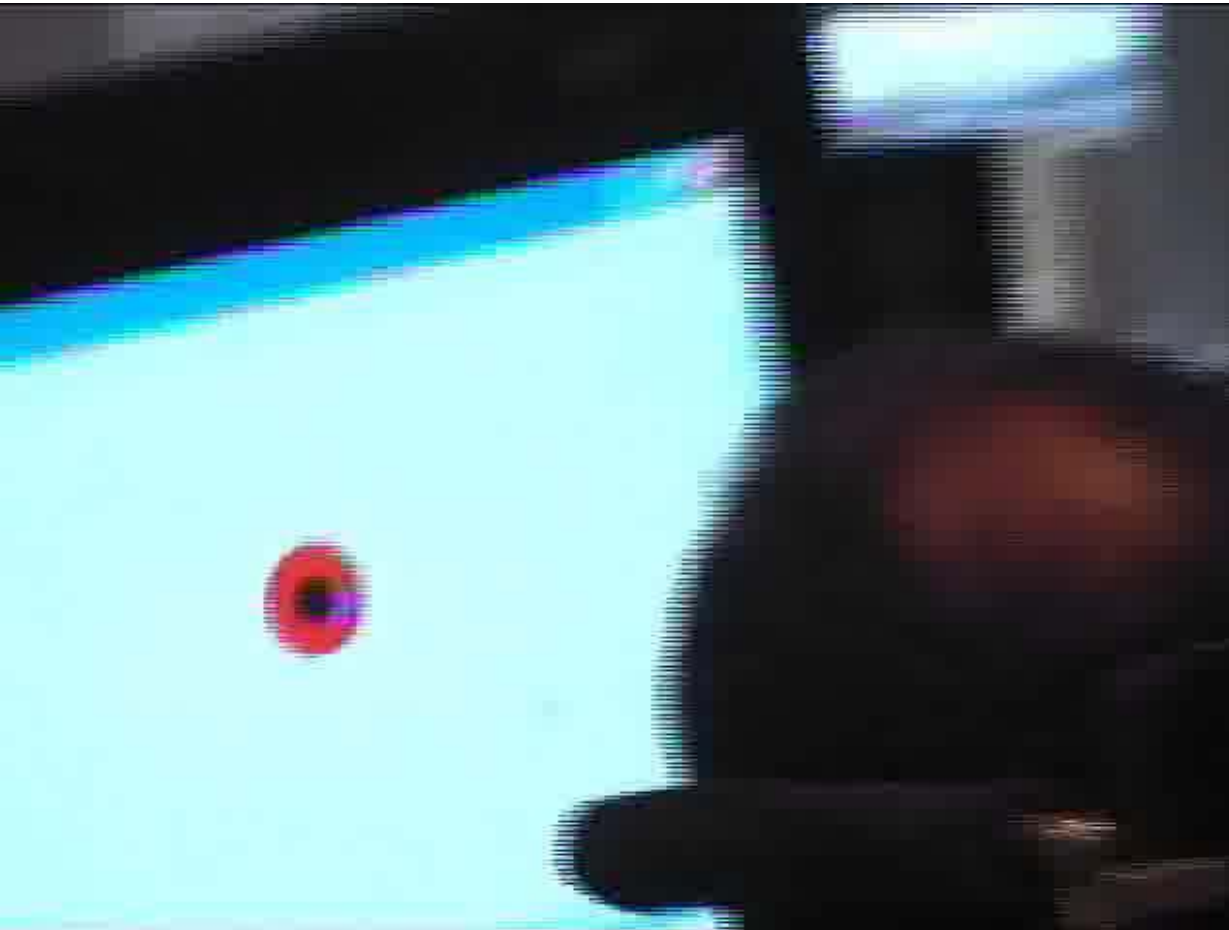
Difficulties for eye control system to accommodate ...e.g nystagmus.



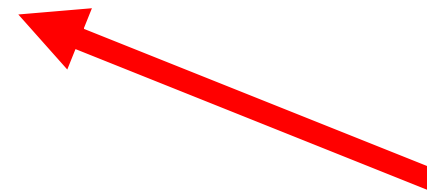
[Click here to play the video from web](#)

(Please click on the picture to play the video)

Michael



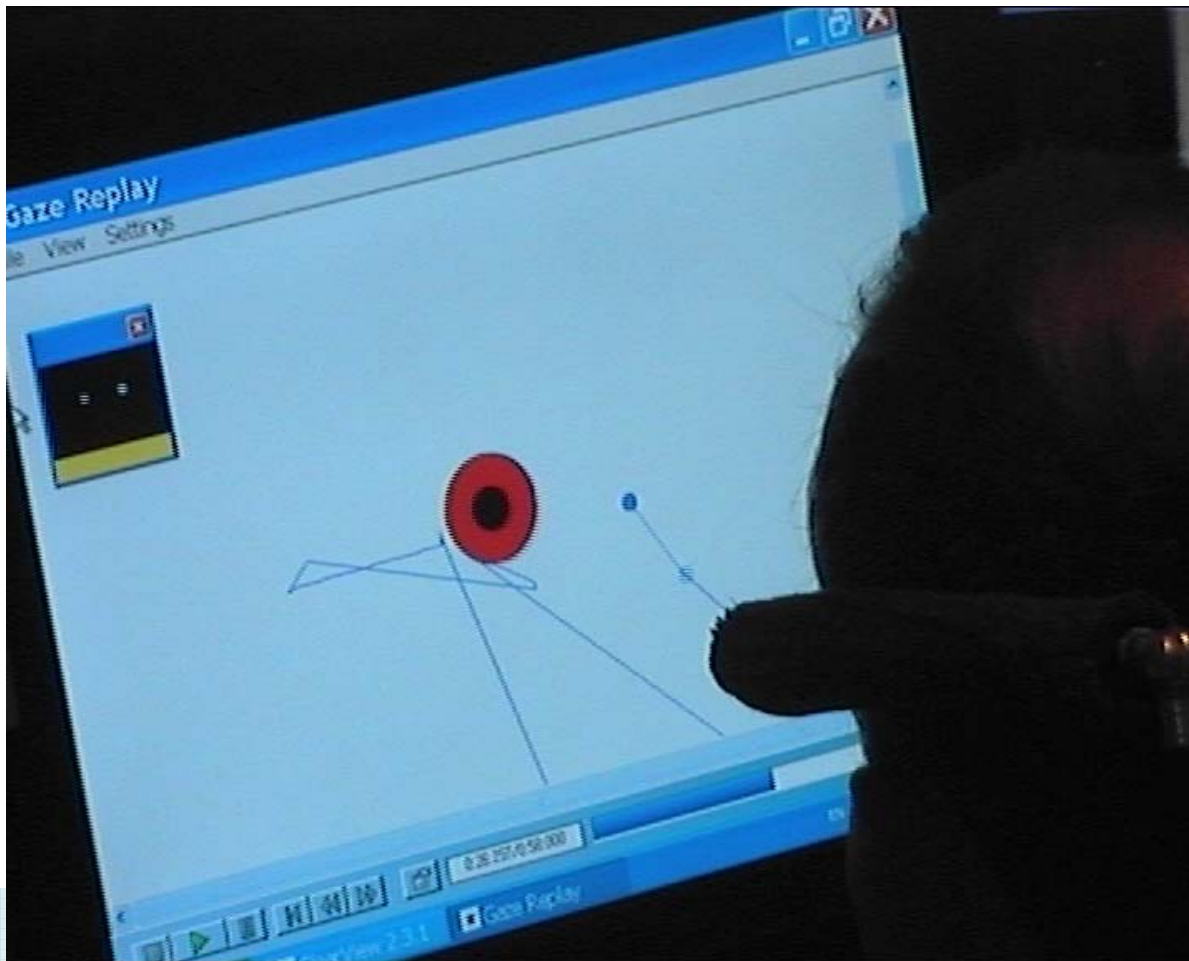
Visual Tracking



*(Please click
on the picture
to play the
video)*

[Click here to play the video from web](#)

Michael



The nature and extent of Michael's involuntary eye movement.

Michael



'2 hit' grid ...

2(c) Framework Software



File Edit Jump Auto content Current Workspace Help

With the Grid 2 you can communicate, create text, use email, browse the Web, send text messages, play music, control the environment, etc

Grid 2 interface showing a text area and a keyboard with various function keys and icons.

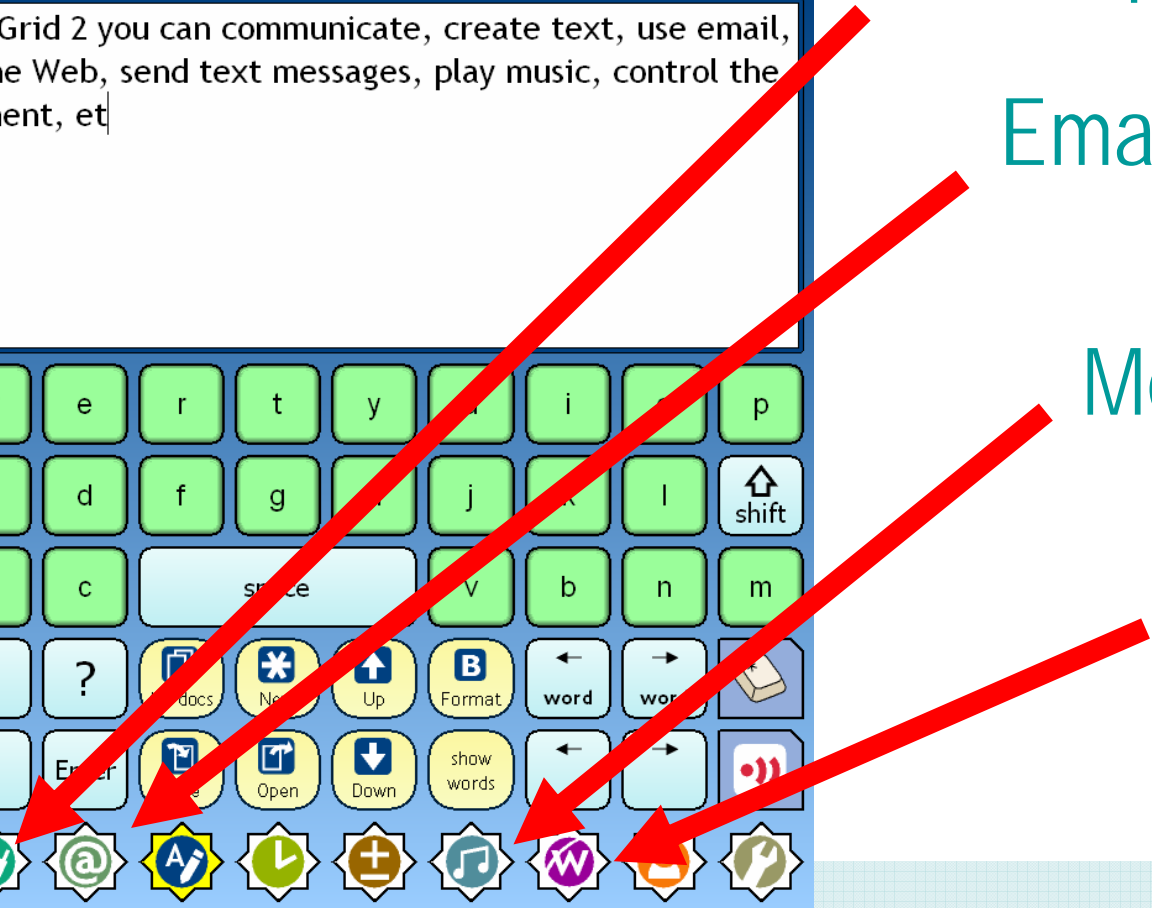
et	qu	w	e	r	t	y	i	p	
etc	a	s	d	f	g	j	k	l	shift
ethnic	z	x	c	space	v	b	n	m	
etiquette	.	,	?	docs	Ne	Up	Format	word	word
	!	'	Enter	Open	Down	show words	←	→	📱
	Ⓜ	📧	📄	🕒	Ⓡ	🎵	🌐	📧	🔧

Mobile phone

Email

Media Player

Web browser

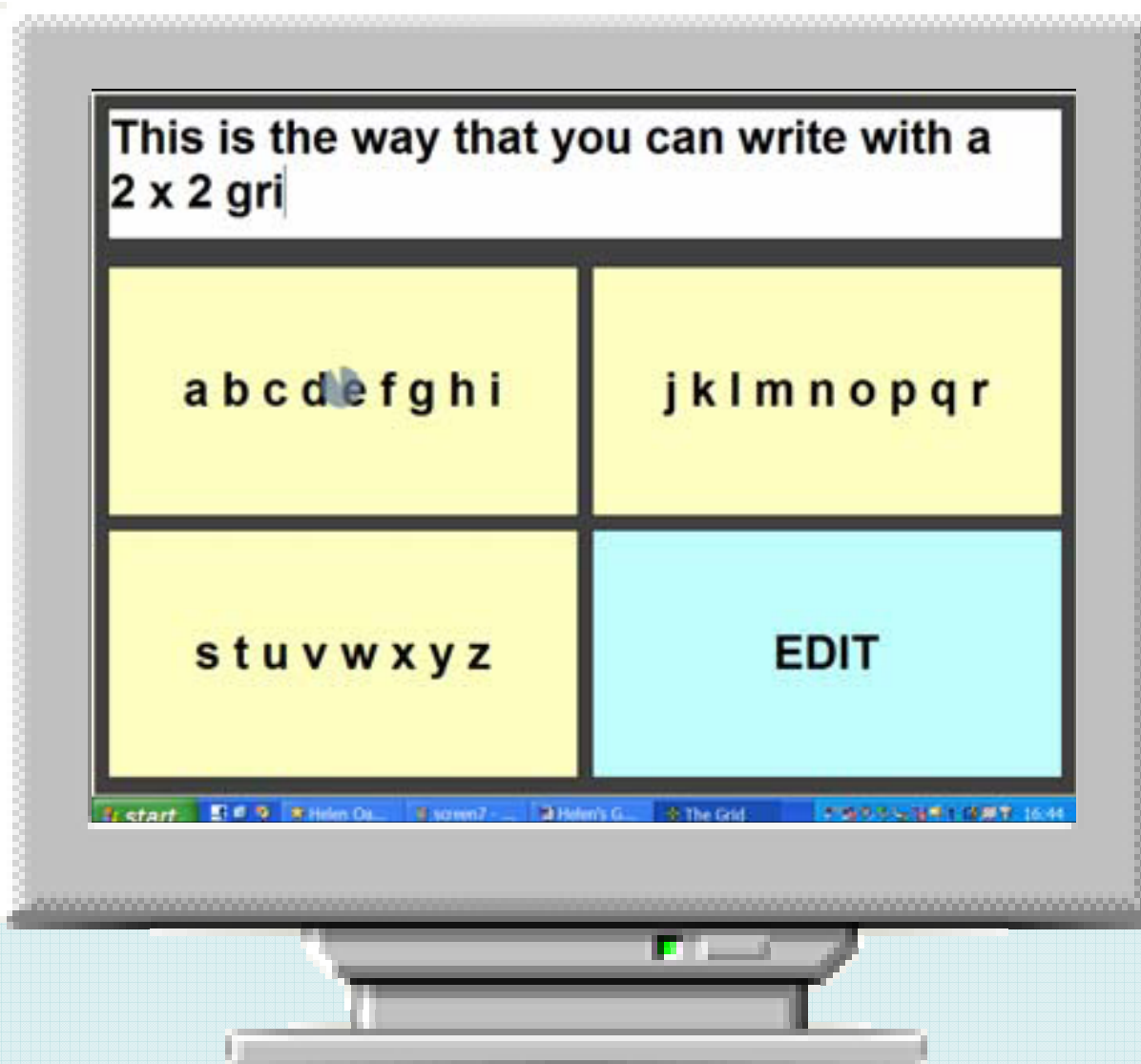


2(c) Framework Software



Some mistakes...

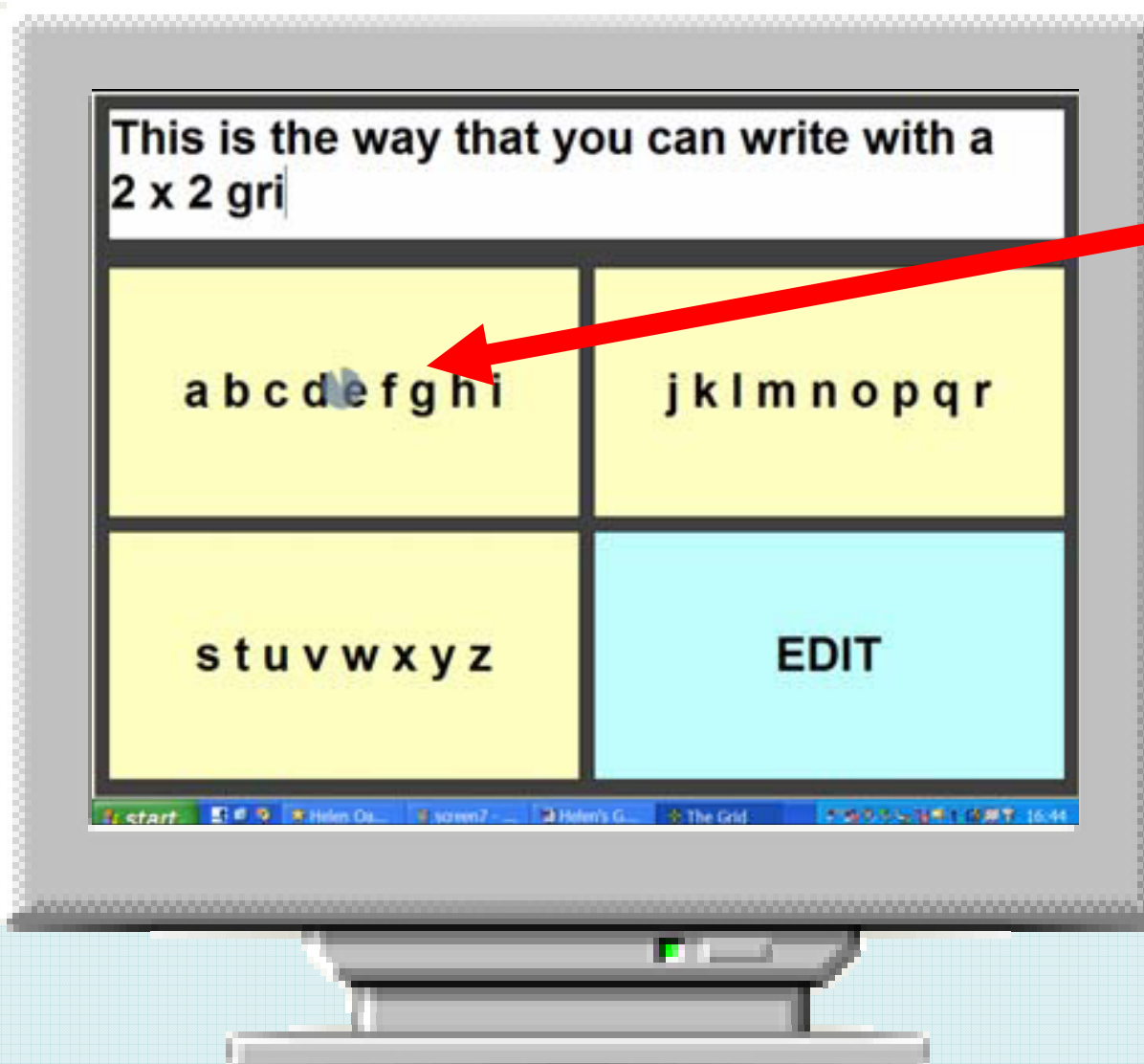
Less 'efficient' BUT...



less tiring

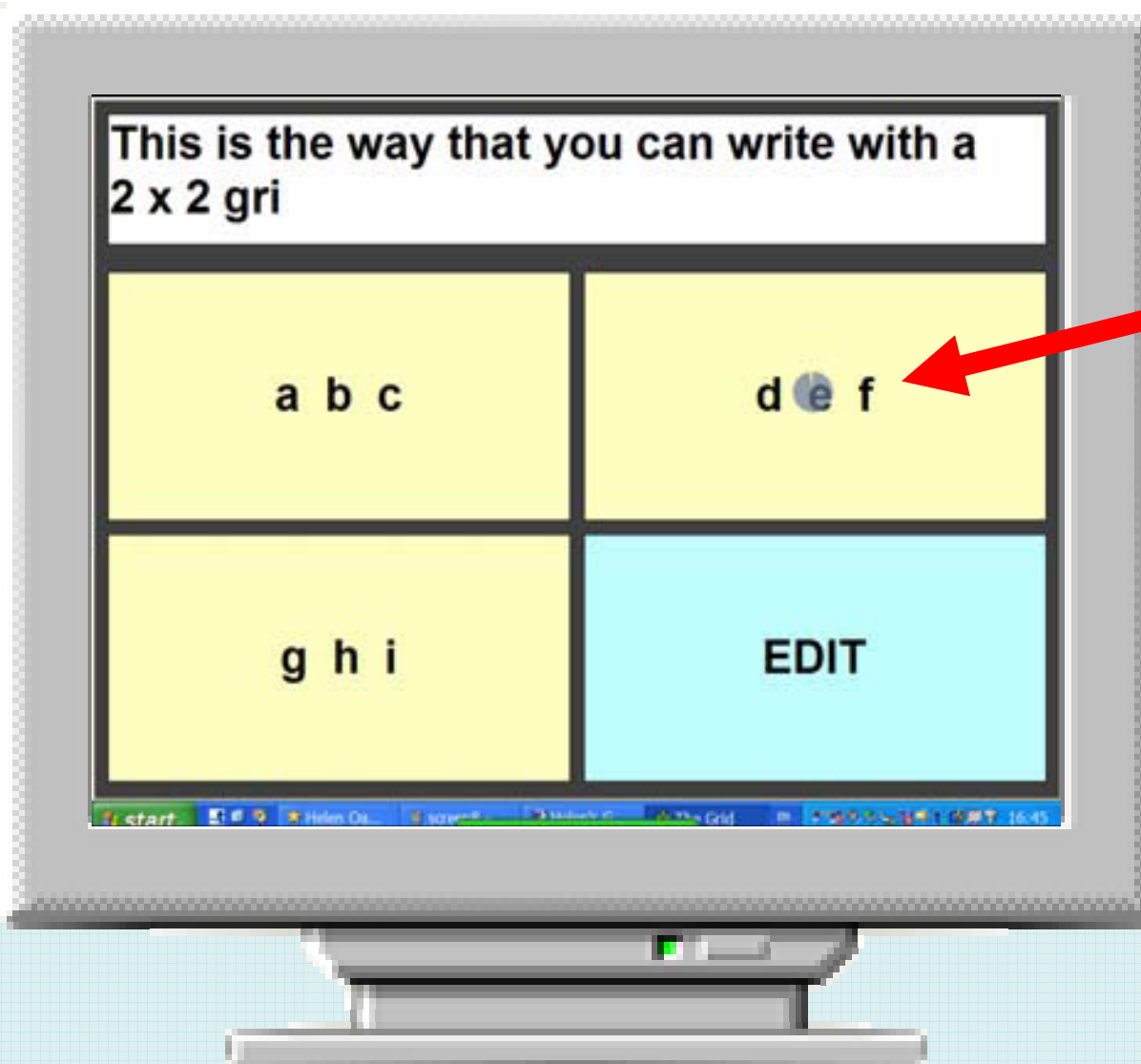
less frustrating

'3-hit' typing...



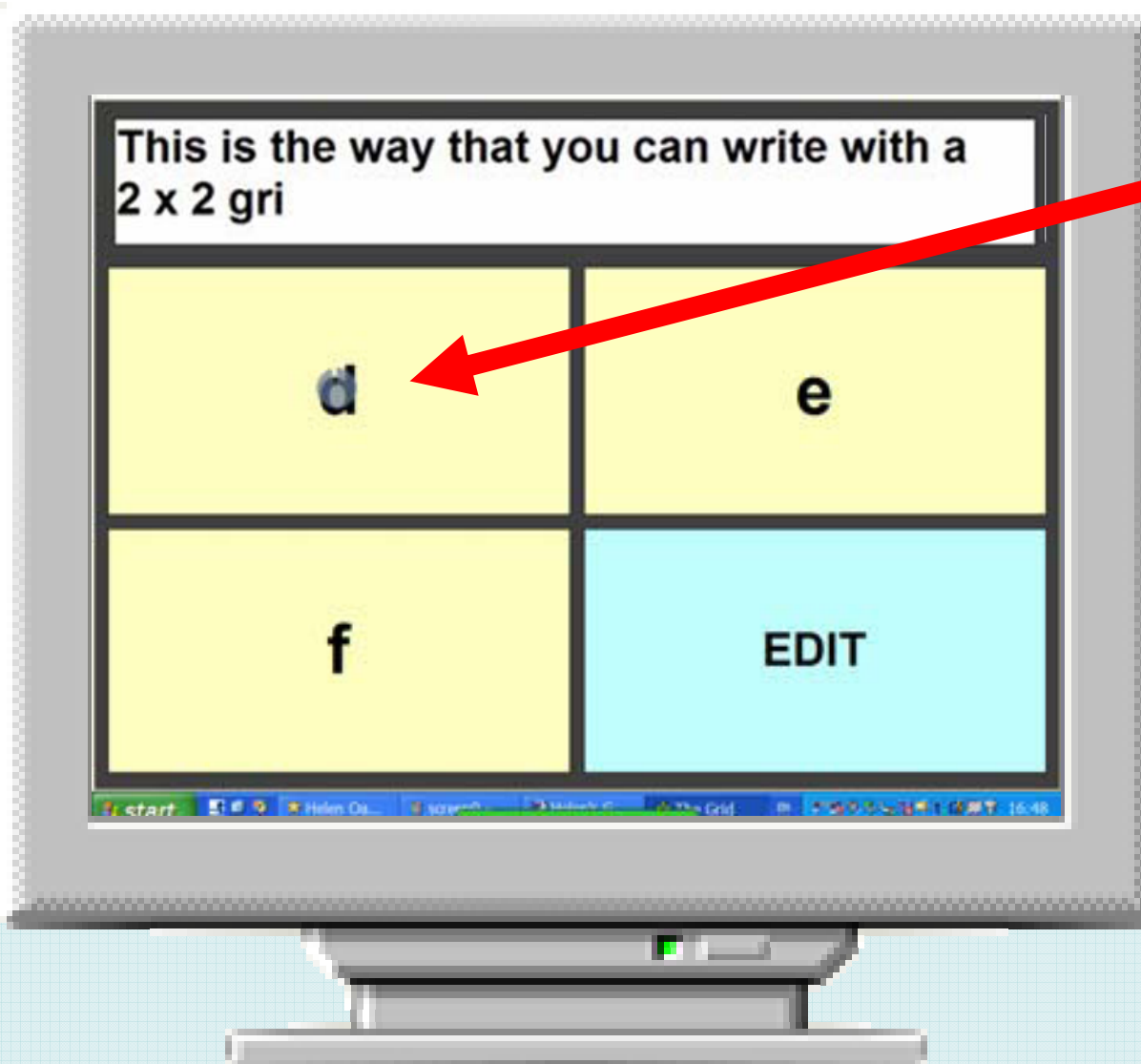
To write 'the letter
'd', first he clicks on
the 'a-l' cell....

'3-hit' typing...



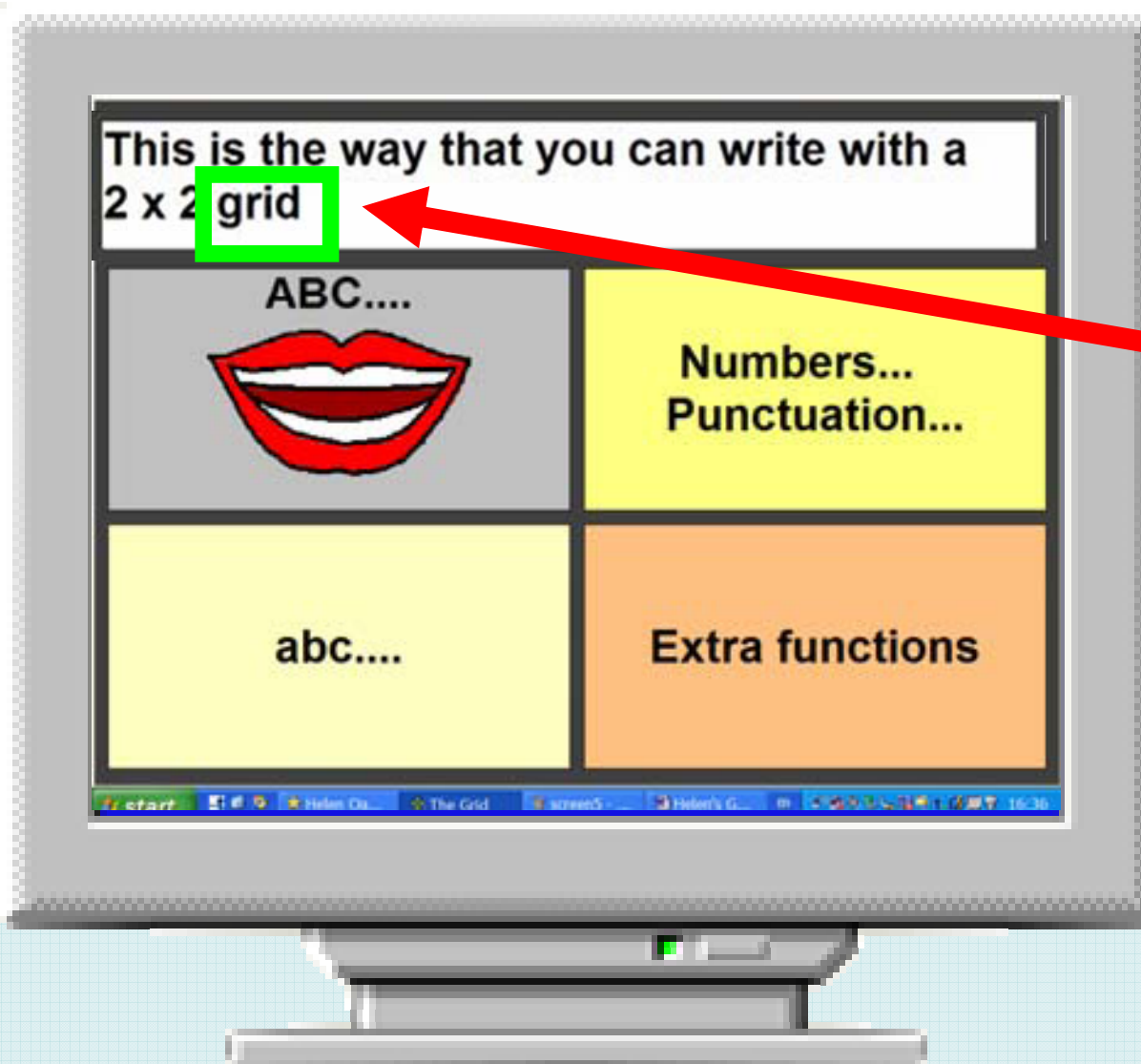
Then he clicks on
the 'def' cell...

'3-hit' typing...



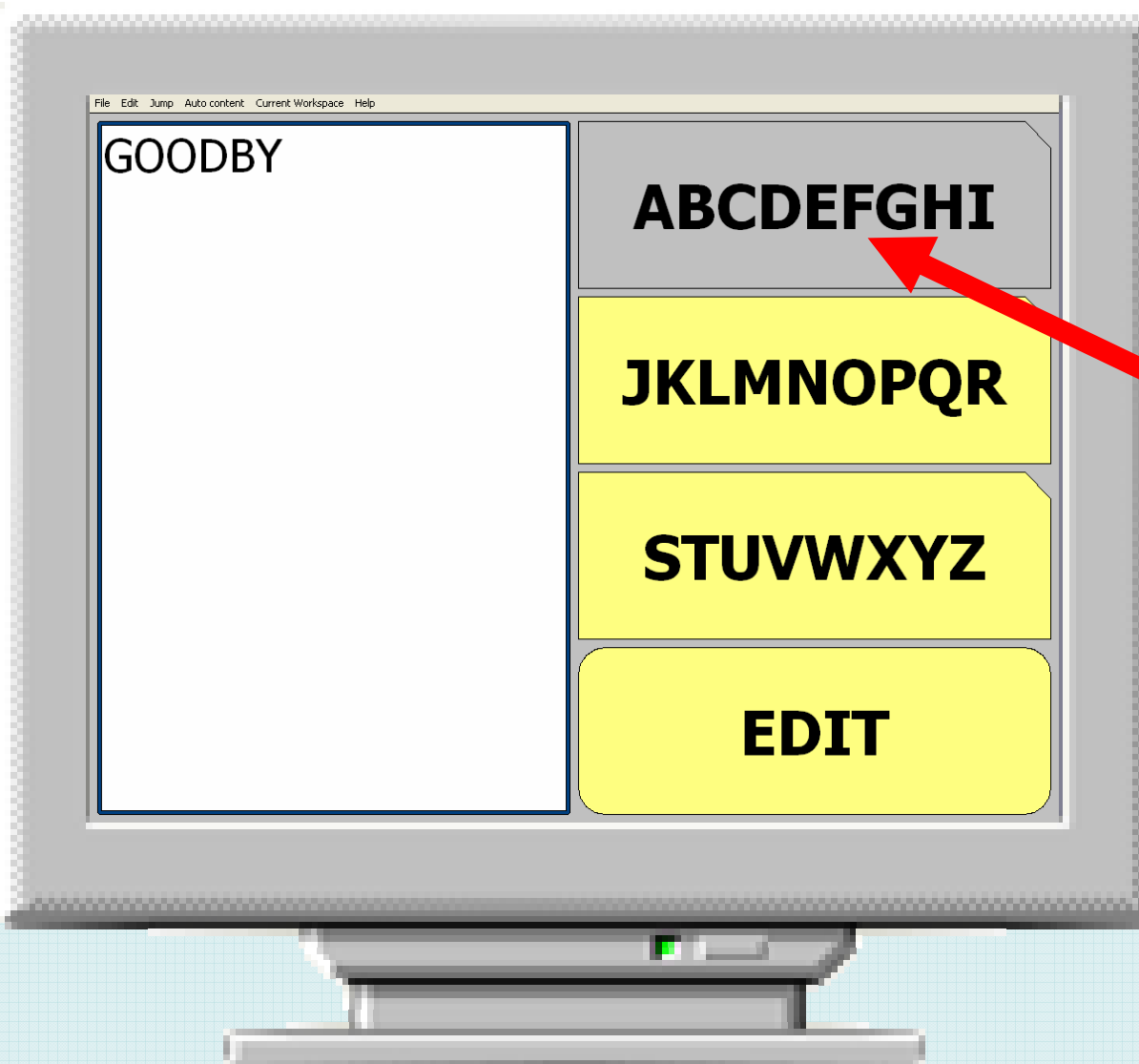
With the third
'hit' he selects
the letter 'd'...

'3-hit' typing...



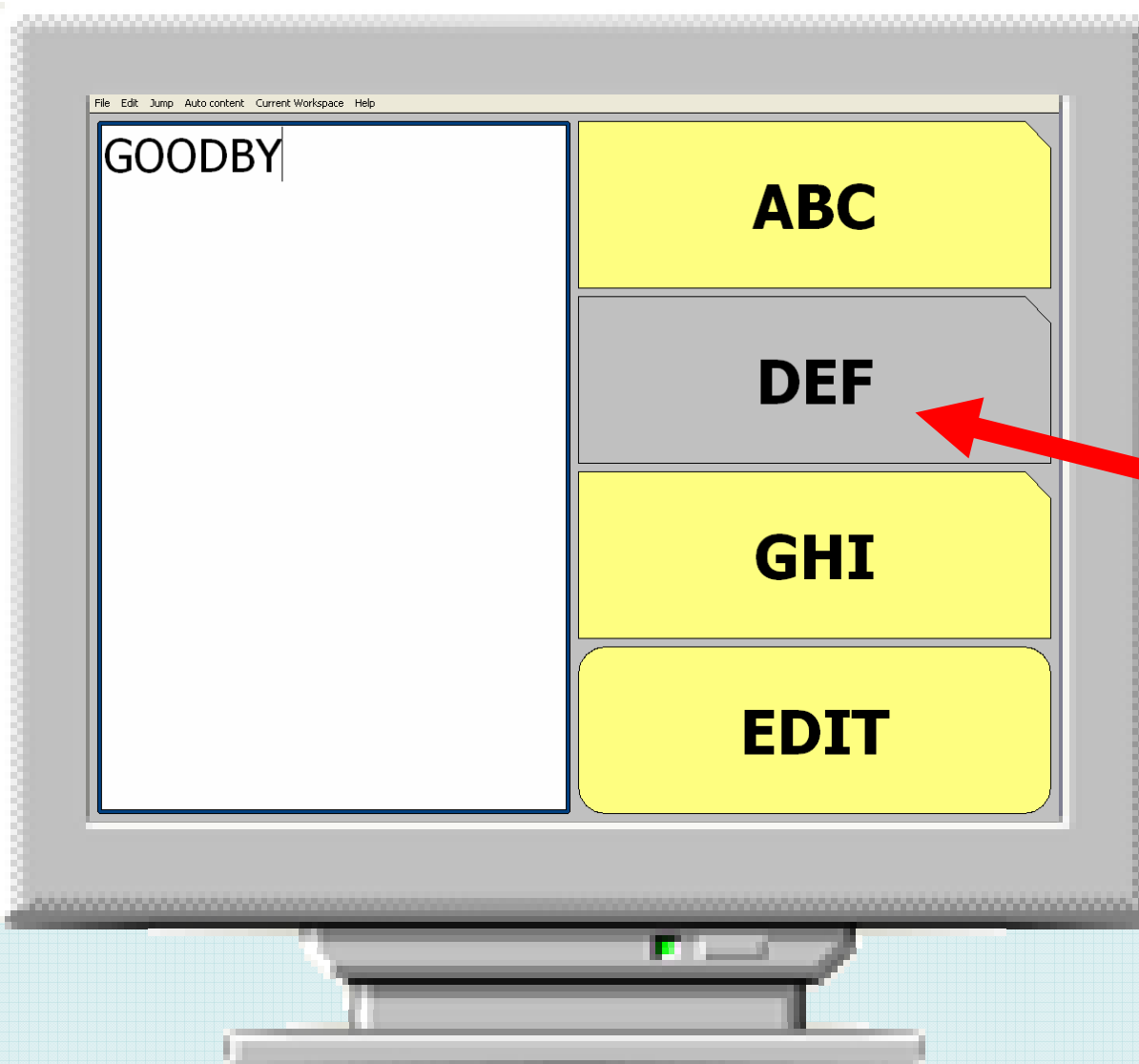
As a result, the letter 'd' appears in the text box to complete the word

Vertical '3-hit' typing...



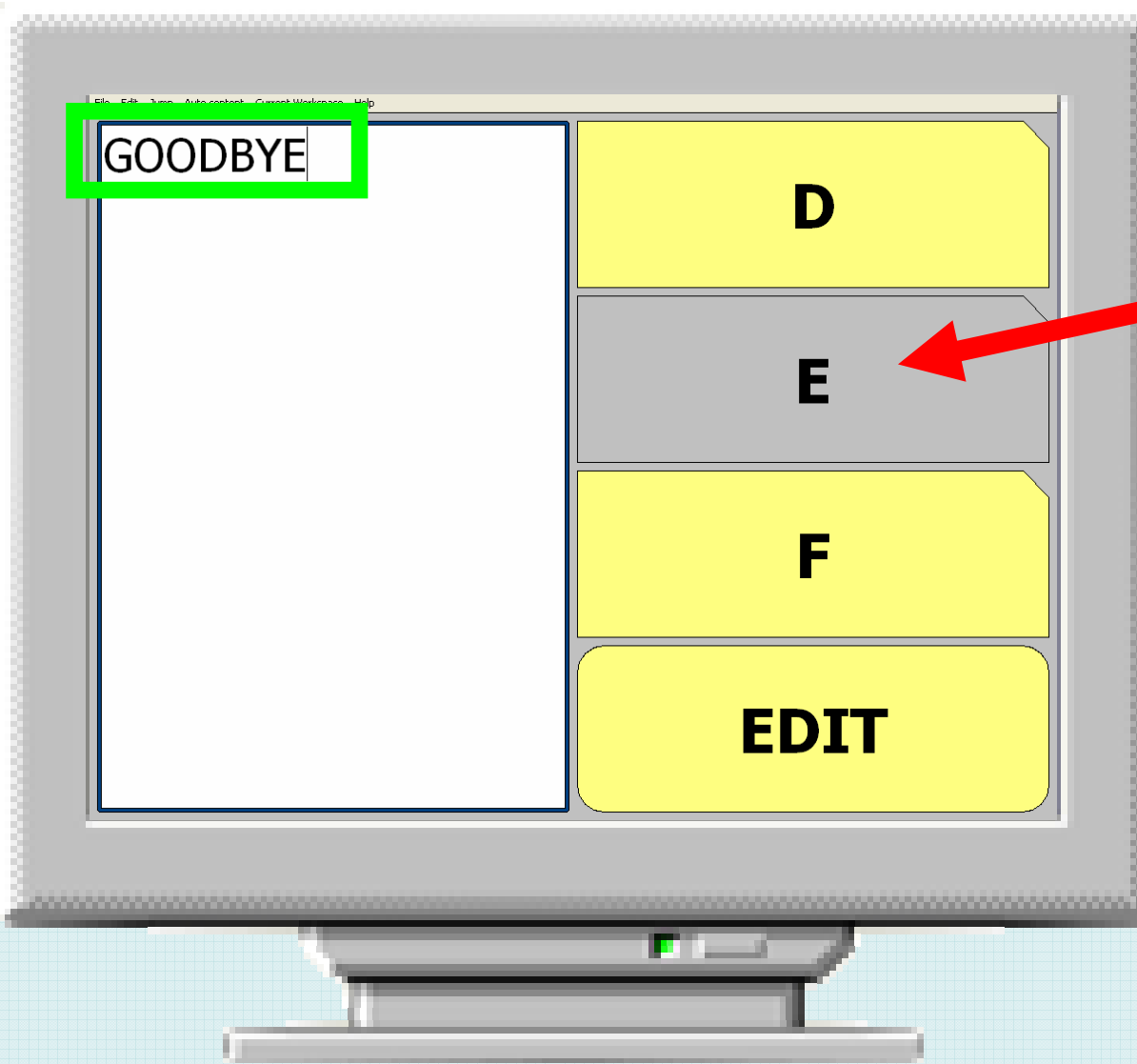
To type the letter
'E', first select the
'A-I' cell...

Vertical '3-hit' typing...



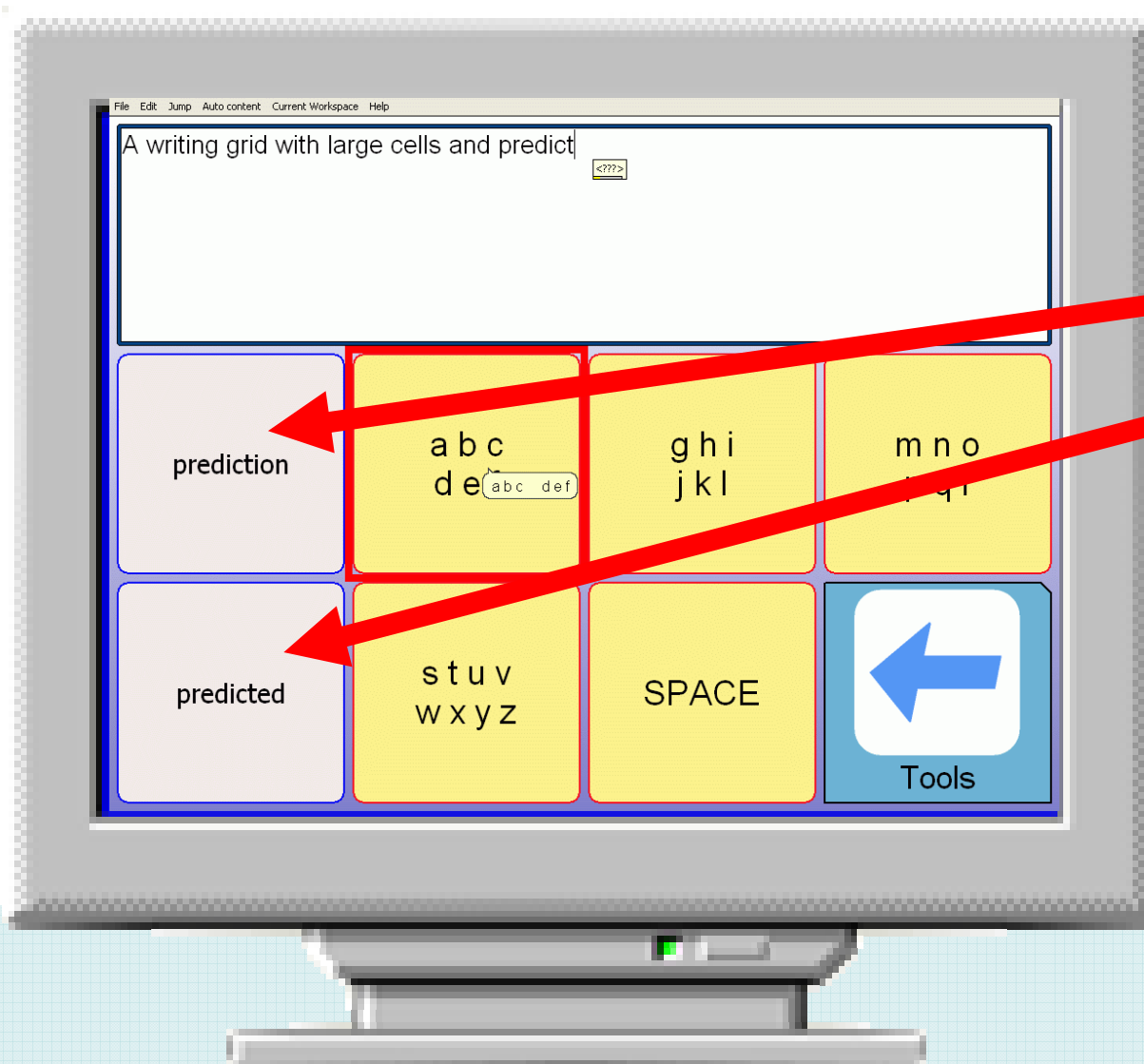
Then the 'def'
cell'...

Vertical '3-hit' typing...



Finally, select 'E'

Predictive '2-hit' typing...

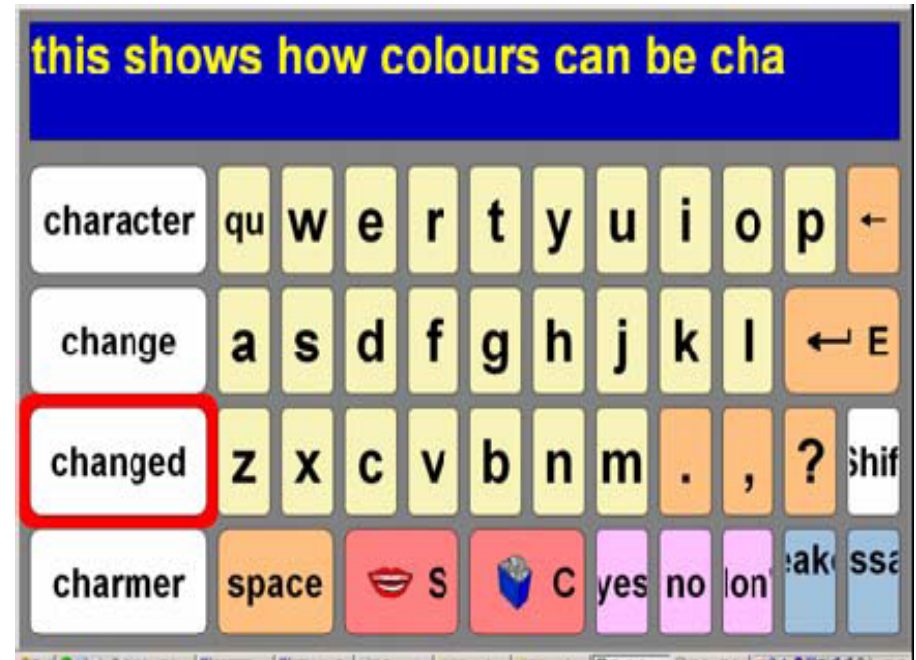


Combining two-hit typing with prediction.

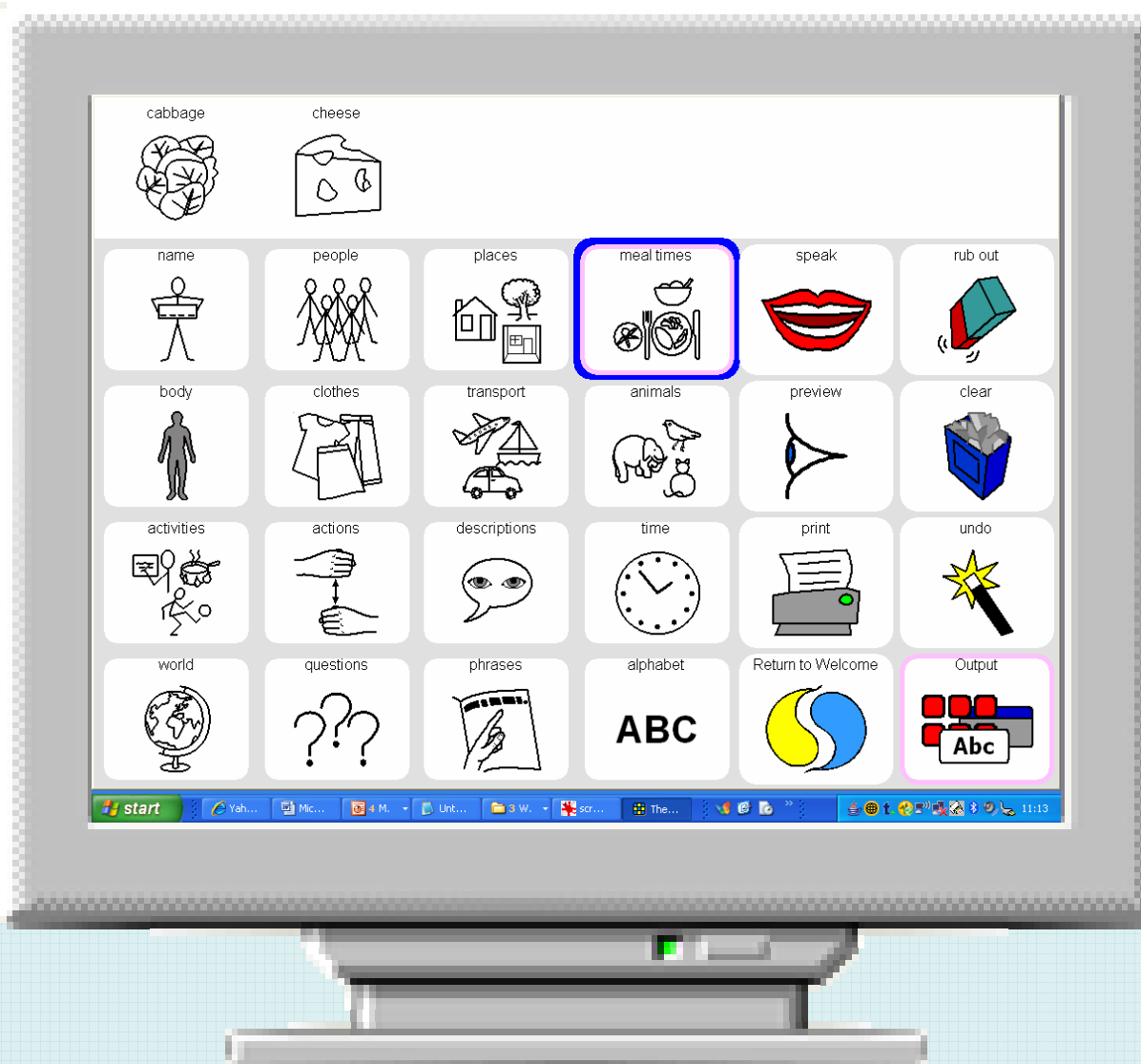
As well as text output, user requirements include....



- Resizable cells and grids
- Flexible calibration process
- Speech facilities
- Choice of languages
- Environmental Control
- Choice of symbols or text output, etc...



Symbol input and output...



Symbols with
symbols & text,
speech output,
resizable, etc...

Highly customisable environmental control



Any size

Text/Symbols

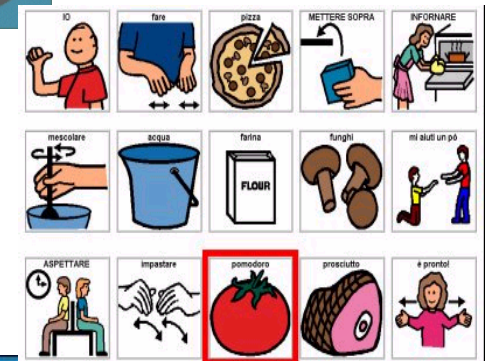
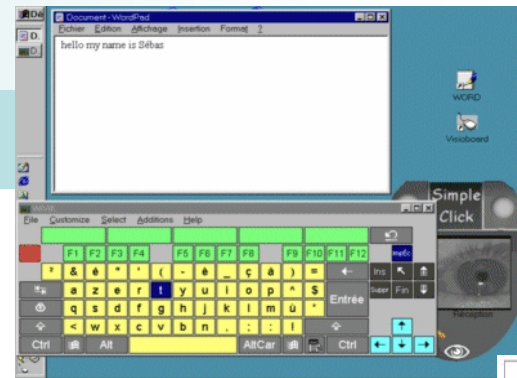
Any colour combination

etc...

A wide choice of framework software....



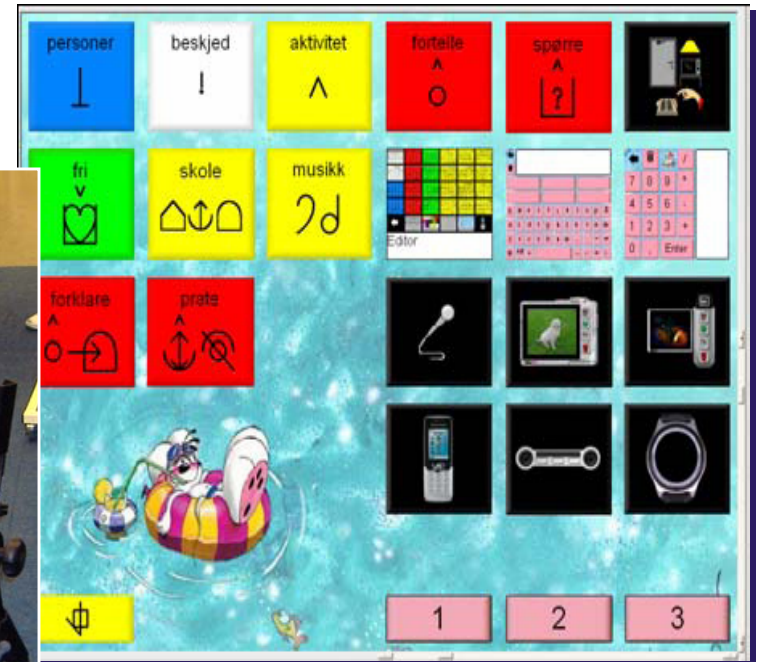
Communicator 3,
The Grid 2
Speaking Dynamically Pro
SAW,
RollTalk,
Clicker 5,
QualiLife,
Wivik,
EZKeys, etc.



A wide choice of framework software....



e.g. Rolltalk...



Putting the eye control user at the centre....



'Participatory Design'

Photograph courtesy of Prof. Anthony Hornof, University of Oregon

Putting the eye control user at the centre....



Photograph courtesy of Prof. Anthony Hornof, University of Oregon

Putting the eye control user at the centre....



Participatory
design
+
framework
software
= success

Photograph courtesy of Prof. Anthony Hornof, University of Oregon

To find out more, please go to...



www.cogain.org

Downloads...

Deliverables 3.1, 3.2 & 3.3

...and more...



COGAIN would like to express its sincere thanks to those who have been kind enough to be involved in the project and to give their permission to be used as case studies in this presentation in order to help others.

For more information...



www.cogain.org