# CSCW Basics

- Intro to Group Work
- **Intro to Groupware** 
- Design of Groupware
- Evaluation of Groupware

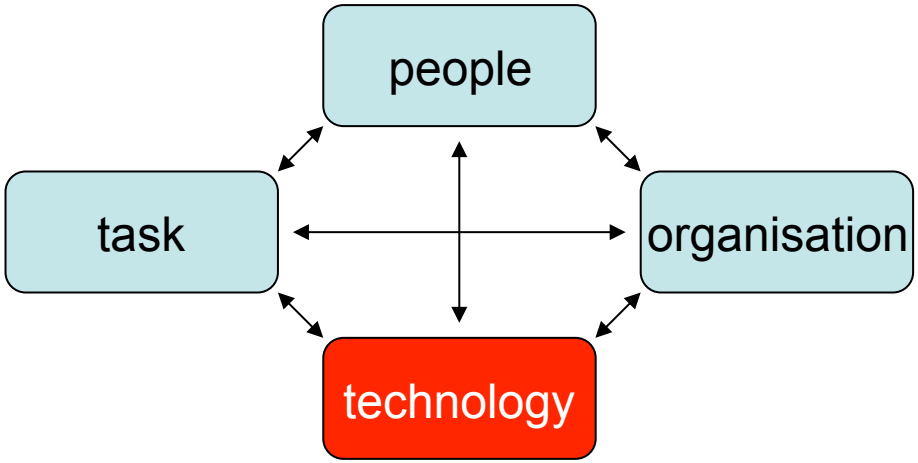
# Learning Outcomes

- After attending this lecture and reading the additional literature, you should be able to:
  - Explain what groupware is
  - Recognise examples of groupware and
  - Use a taxonomy for categorising groupware applications based on space/time and richness

# Resources

- http://www.usabilityfirst.com/groupware/
- http://www.id-book.com/chapter4_links.php

# The Context




# In the beginning

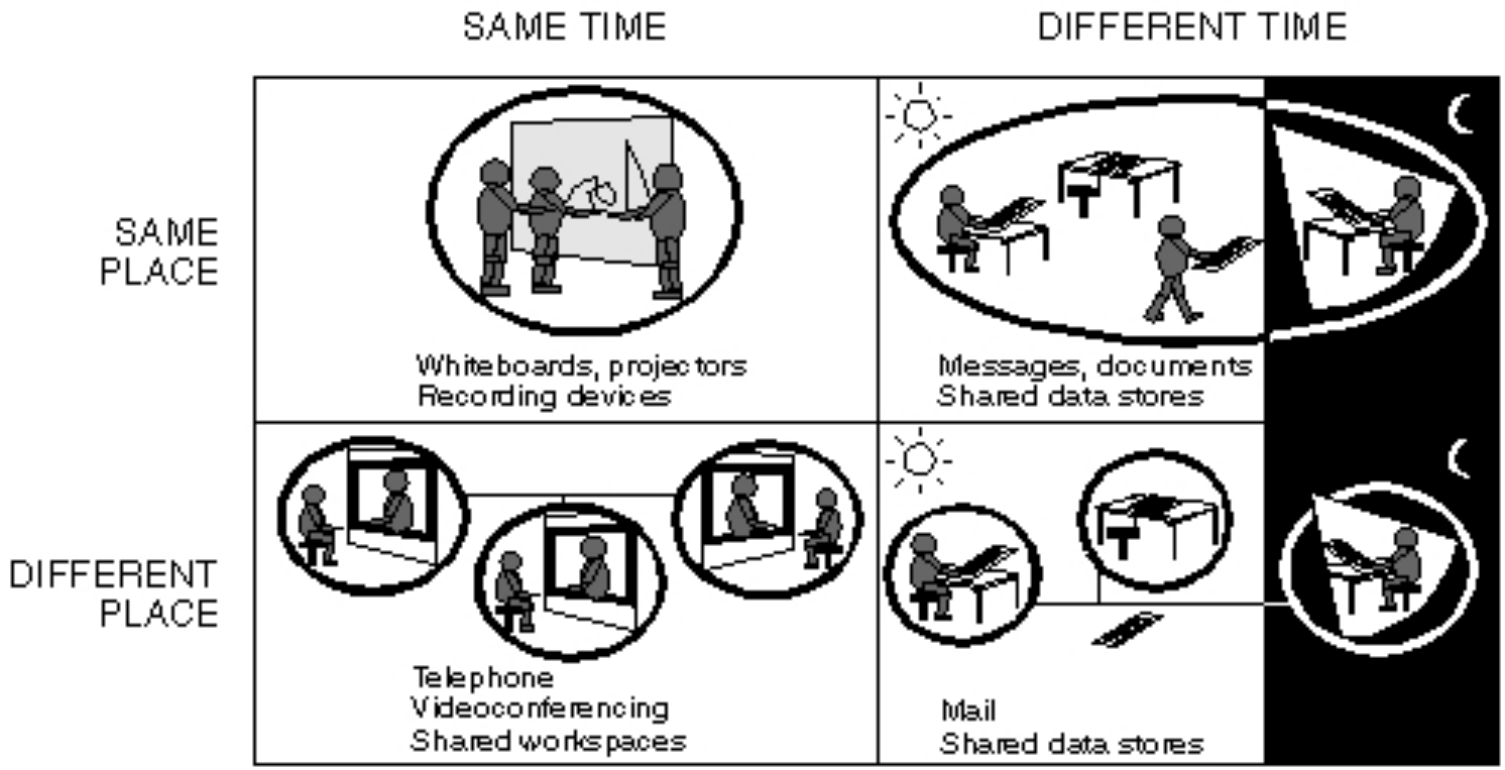
- Douglas Engelbart and colleagues at Augmented Research Centre of Stanford Research Institute
  - Multimedia access to a networked computer system
    - The first mouse
    - Hypertext
    - Multiple Windows
    - On-screen video conferencing


  - Video available on http://sloan.stanford.edu/MouseSite/1968Demo.html

# Definition

- Groupware is a generic term for specialized computer aids that are designed for use by collaborative work groups…Groupware can involve software, hardware, services and group process support.
  - Groupware provides an interface to a shared environment.
  - Provides synergistic mechanisms for coordinating each user's actions with respect to the rest of the group and the system.
  - In contrast to individual data processing, with groupware **collaboration / cooperation/communication** are important issues.

# Space-Time Matrix

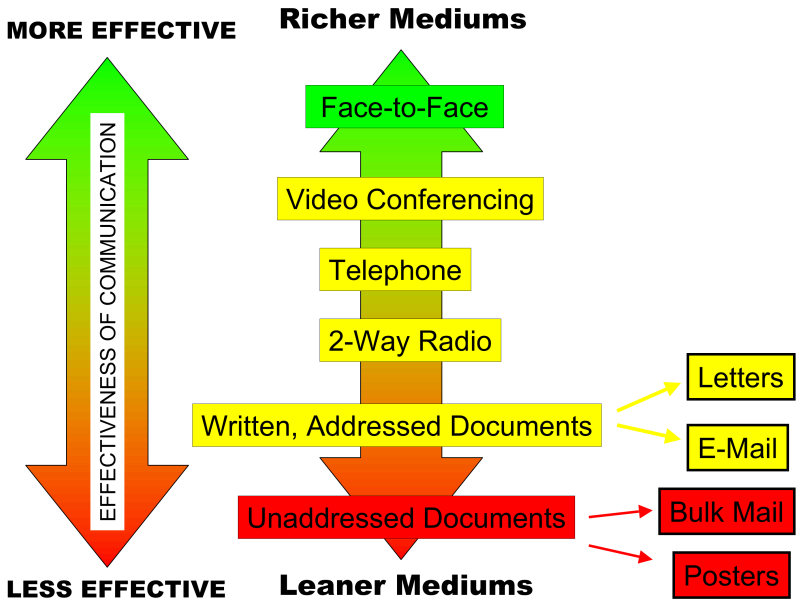


# What groupware have you used?

- Think about your experiences with groupware.
  - What groupware have you used?
  - In which categories do these fall?
- What would you say were particularly good or bad experiences?
  - As an individual
  - From a Team perspective

# Media richness theory

- Framework to describe a communication medium by its ability to reproduce the information sent over it



# Media richness

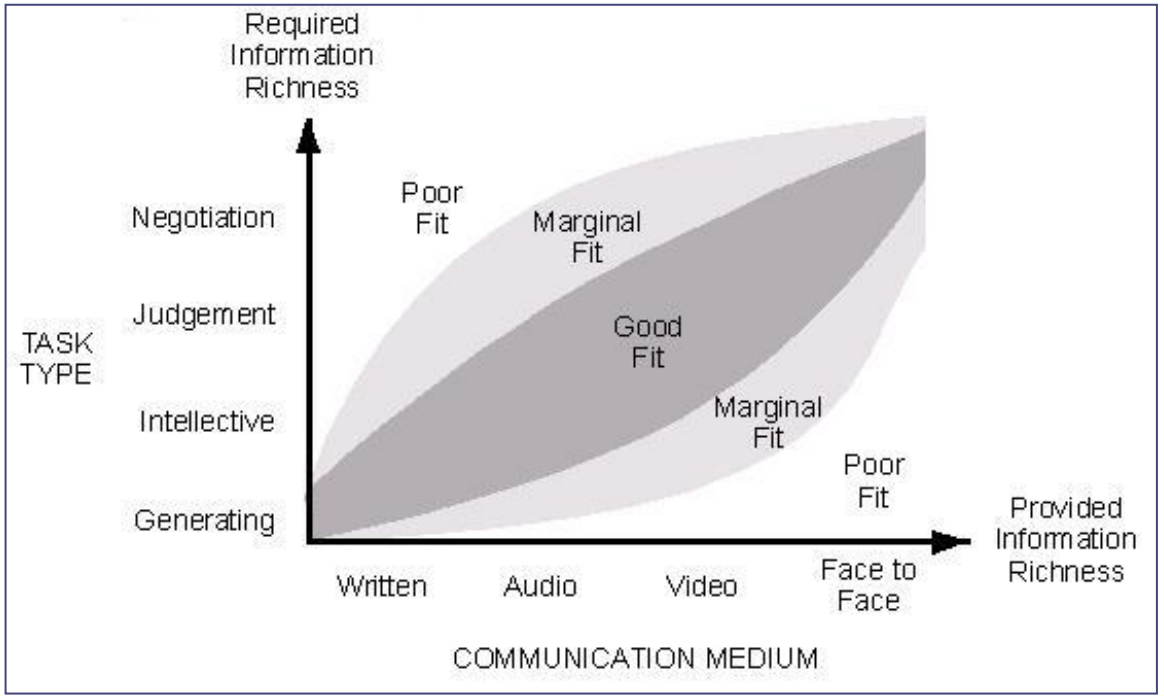
- Daft and Lengel define media richness as a function of
  - the medium's capacity for immediate feedback,
  - the number of cues and channels available,
  - language variety;
  - the degree to which intent is focused on the recipient

# Different tasks

- Task taxonomy
  - *Generating Tasks:* coming up with alternative solutions to a problem (as in brainstorming) or alternative options for action
  - *Intellective Tasks:* solving problems with correct answers
  - *Judgement Tasks:* deciding issues where there are no right answers
  - *Negotiation Tasks:* resolving conflicts of interests or viewpoints
- The different types of task require different amounts of information, not just about the nominal content of the task, but also about peoples' feelings and attitudes.

# Communication richness

- Face-to-face
- Video
- Audio
- Text based
- However,
  - Touch?
  - Smell?



# What should groupware do?

- Provide communication between group members
- Collaboration
  - Provide organisation and common understanding of the work processes and other people
    - Awareness support
  - Support decision making and problem solving

# Communication: being social

- How many friends do you have on Facebook, Skype, vs real life?
- How many contacts you have on your e-mail (vs. skype, facebook, vs. real life)?
- How much do they overlap?
- Are F2F rules and etiquette still applicable to online environment?
- Do different rules apply to different contexts?

# 2 Functions of conversation

- Referential part of the message
  - The content of what we say
- Relational part of the message
  - The style of what we say
  - It reflects a perception of “Who I am”, “Who you are” in “what context are we”

# Conversational mechanisms

- Various ‘rules’ are followed when holding a conversation, e.g. mutual greetings

  A: Hi there

  B: Hi!

  C: Hi

  A: All right?

  C: Good, how’s it going?

  A: Fine, how are you?

  C: OK

  B: So-so. How’s life treating you?

# Rules: turn taking

- Sacks et al. (1978) work on conversation analysis describe three basic rules:

  Rule 1: the current speaker chooses the next speaker by asking an opinion, question, or request, looking at somebody

  Rule 2: another person decides to start speaking

  Rule 3: the current speaker continues talking

# Conversational rules

- Turn-taking used to coordinate conversation
  - A: Shall we meet at 8?
  - B: Um, can we meet a bit later?

  - A: Shall we meet at 8?
  - B: Wow, look at him?
  - A: Yes what a funny hairdo!
  - B: Um, can we meet a bit later?
- Back channeling to signal to continue and following
  - Uh-uh, umm, ahh

# More conversational rules

- Farewell rituals
  - Bye then, see you, yer bye, see you later….
- Implicit and explicit cues
  - e.g. looking at watch, fidgeting with coat and bags
  - explicitly saying “Oh dear, must go, look at the time, I’m late…”

# Breakdowns

A: Can you tell me the way to get to Cinema X?

B: Yes you go down here for 2 blocks, then take a right [pointing to the right]. Go on till you get to the lights, and then it's on the left

A: Oh, so I go along here for a couple of blocks and then take a right and the cinema is at the lights [pointing ahead of him]

B: No, you go on THIS street for a couple off blocks (gesturing more vigorously)

A: Ahhhh! I thought you meant THAT one: so it's THIS one [pointing in the same direction as the other person]

B: Uh-Uhm, yes that's right: THIS one.

# Breakdowns in conversation

- When someone says something that is misunderstood:
  - Speaker will repeat with emphasis:
    - A: “this one?”
    - B: “no, I meant that one!”
  - Use tokens:
    - Eh? Quoi? Huh? What?
    - Puzzled look

# What happens in social media conversations?

- Do same conversational rules apply?
- Are there more breakdowns?
- How do people repair them for:
  - Phone?
  - email?
  - Instant messaging?
  - texting?
  - Skyping?

# Remote conversations

- How to support conversations when people are ‘at a distance’ from each other
- Many applications have been developed
  - e.g., email, videoconferencing, videophones, videoconferencing, instant messaging, chatrooms
- Do they mimic or move beyond existing ways of conversing?

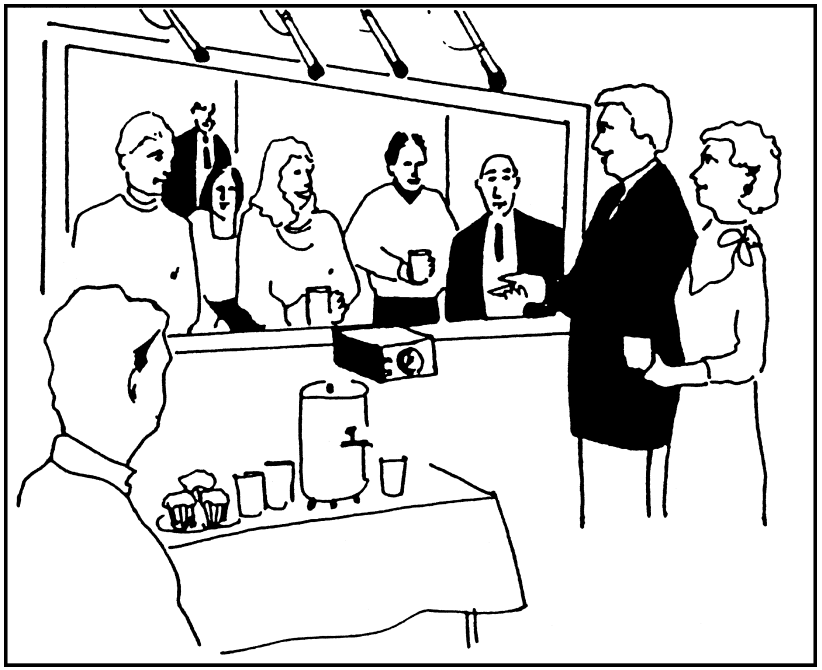
# Synchronous CMC

- Conversations are supported in real-time through voice and/or typing and/or video
  - One-to-one?
    - Over the phone – G3 mobile phones
    - Instant messaging (IM)
    - Chat
  - One-to-many?
    - Video link/Speaker phone
    - Web chat (Netmeeting) –**mailing list**
    - CVE
  - Many-to-one?
    - “class feedback”
    - Portholes
  - Many-to-many?
    - Video Conference between sites (Hypermirror)

# Early videophones

# VideoWindow system

- (Bellcore, 1989)  Shared space: converstaion between people 50 miles
- 3 x 8 ft ‘picture-window’ between two sites with video and audio



# Usage practices

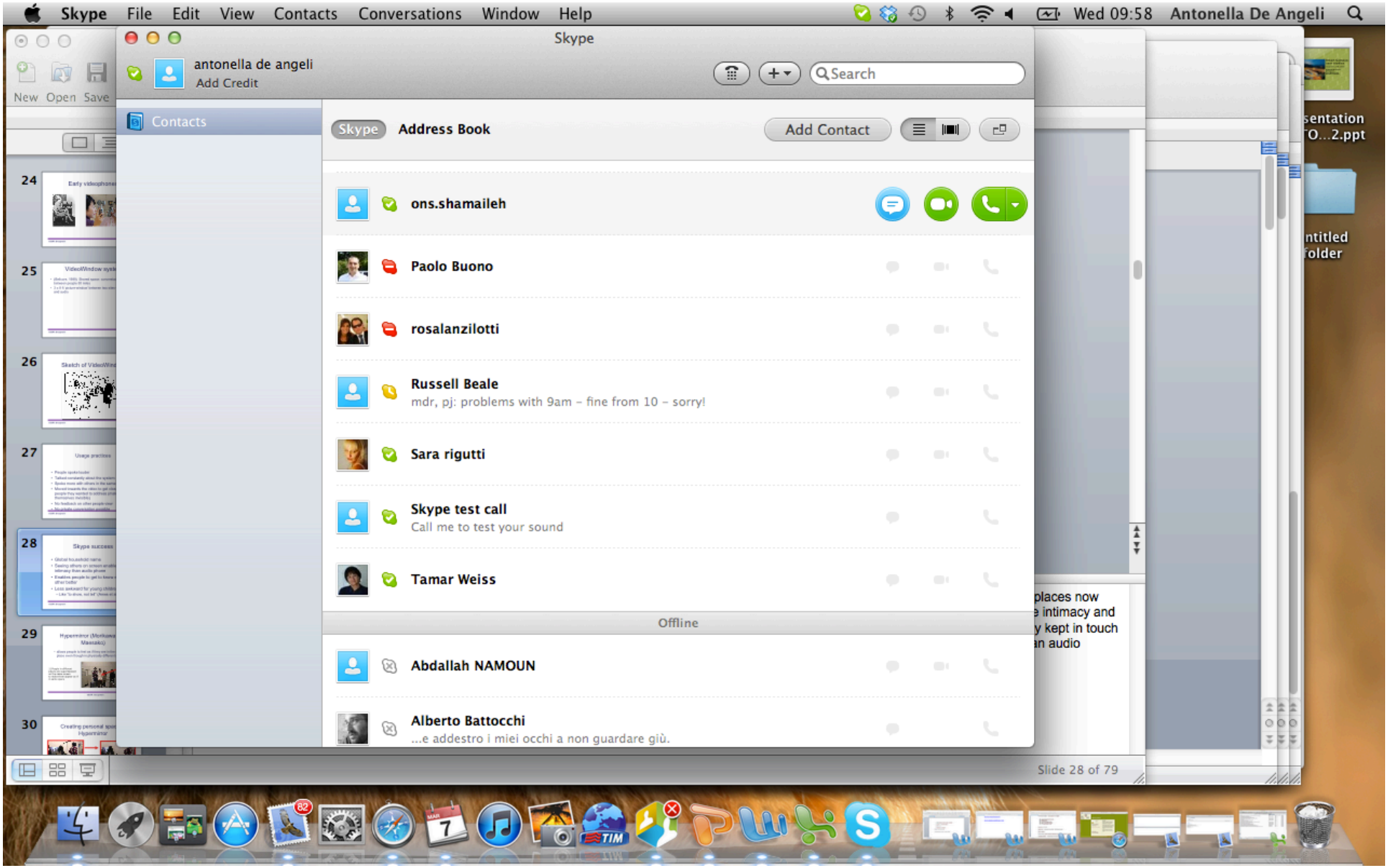
- People spoke louder
- Talked constantly about the system
- Spoke more with others in the same room
- Moved towards the video to get closer to the people they wanted to address (making themselves invisible)
- No feedback on other people view
- No private conversation possible

# Portholes (Dourish and Bly, 1992)

- Regularly updated digitized images of people in their offices appeared on everyone's desktop machines throughout day and night

# Skype success

- Global household name
- Seeing others on screen enables more intimacy than audio phone
- Enables people to get to know each other better
- Less awkward for young children
  - Like “to show, not tell” (Ames et al, 2010)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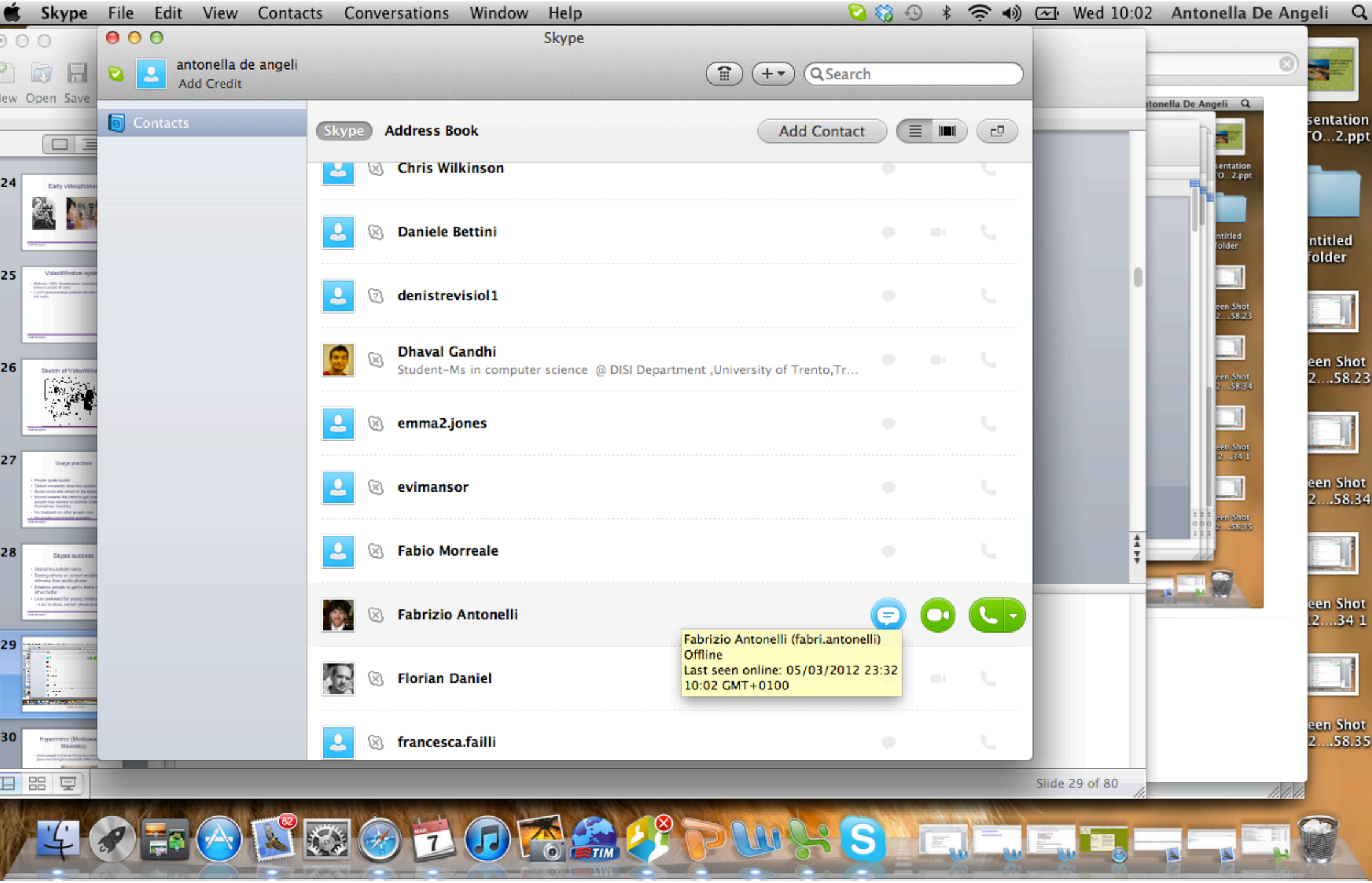
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evimansor
Fabio Morreale
Fabrizio Antonelli
Fabrizio Antonelli (fabri.antonelli)
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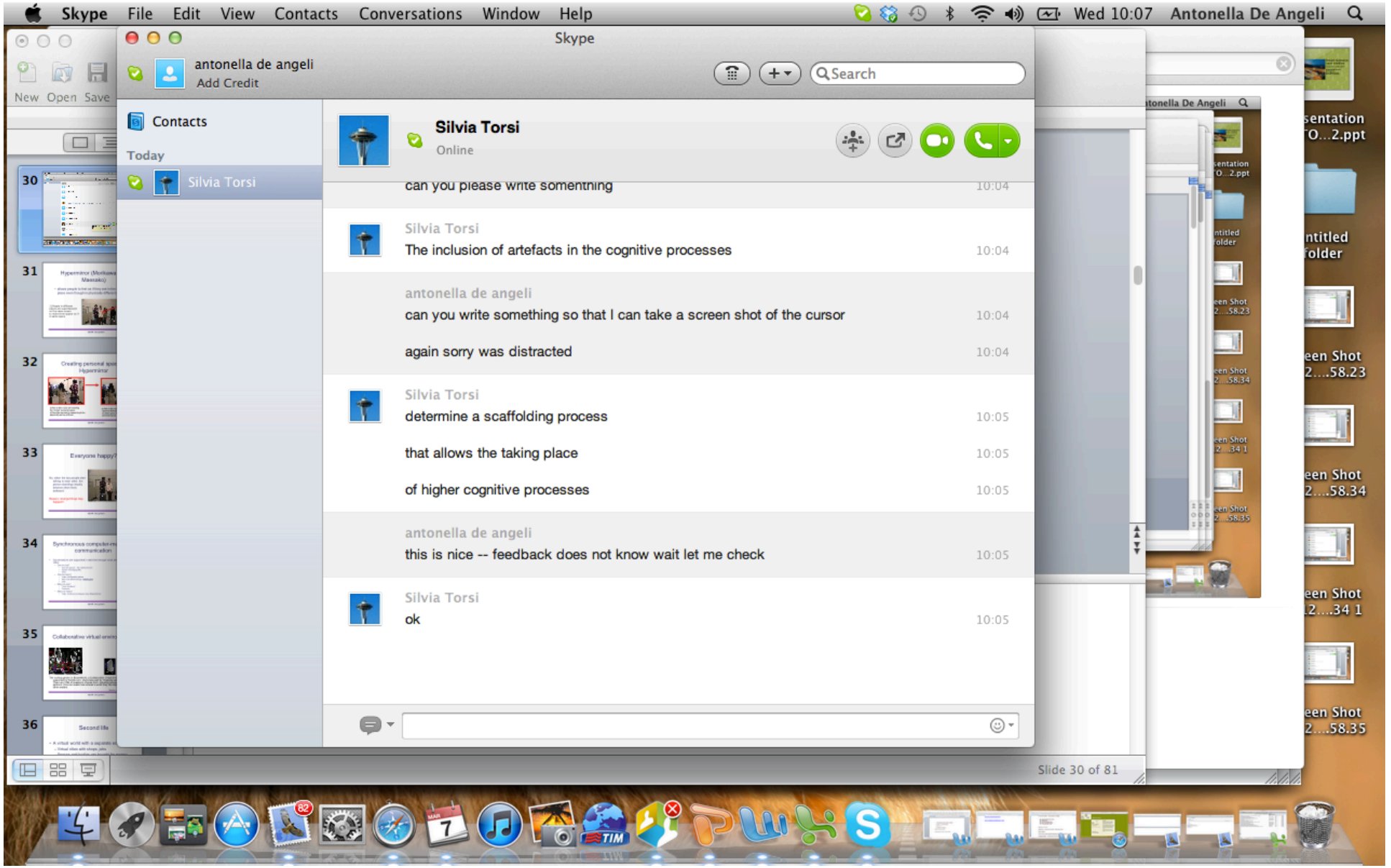
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Silvia Torsi
The inclusion of artefacts in the cognitive processes 10:04
antonella de angeli
can you write something so that I can take a screen shot of the cursor 10:04
again sorry was distracted 10:04
Silvia Torsi
determine a scaffolding process 10:05
that allows the taking place 10:05
of higher cognitive processes 10:05
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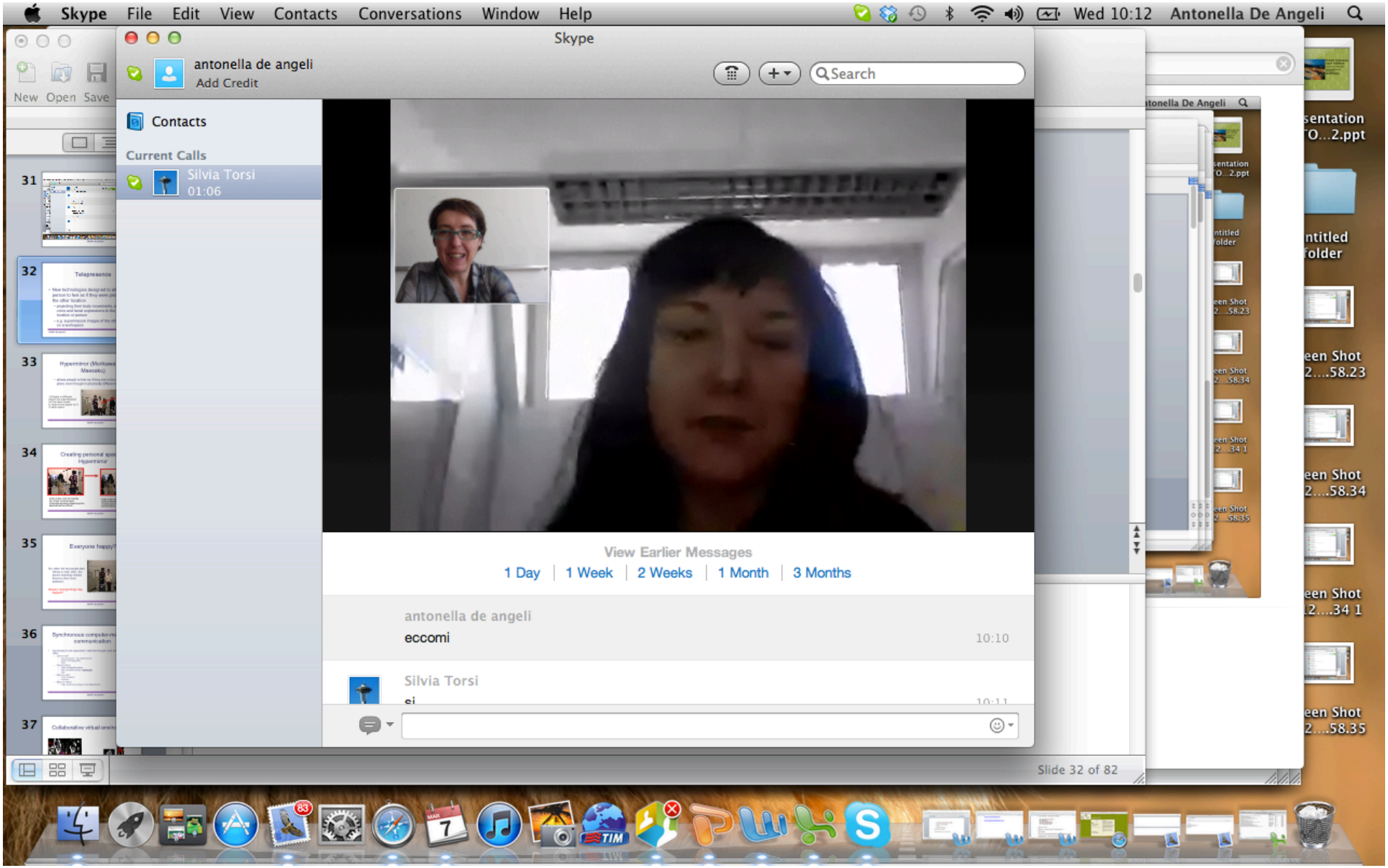
this is nice -- feedback does not know wait let me check 10:05
Silvia Torsi
ok 10:05
Slide 30 of 81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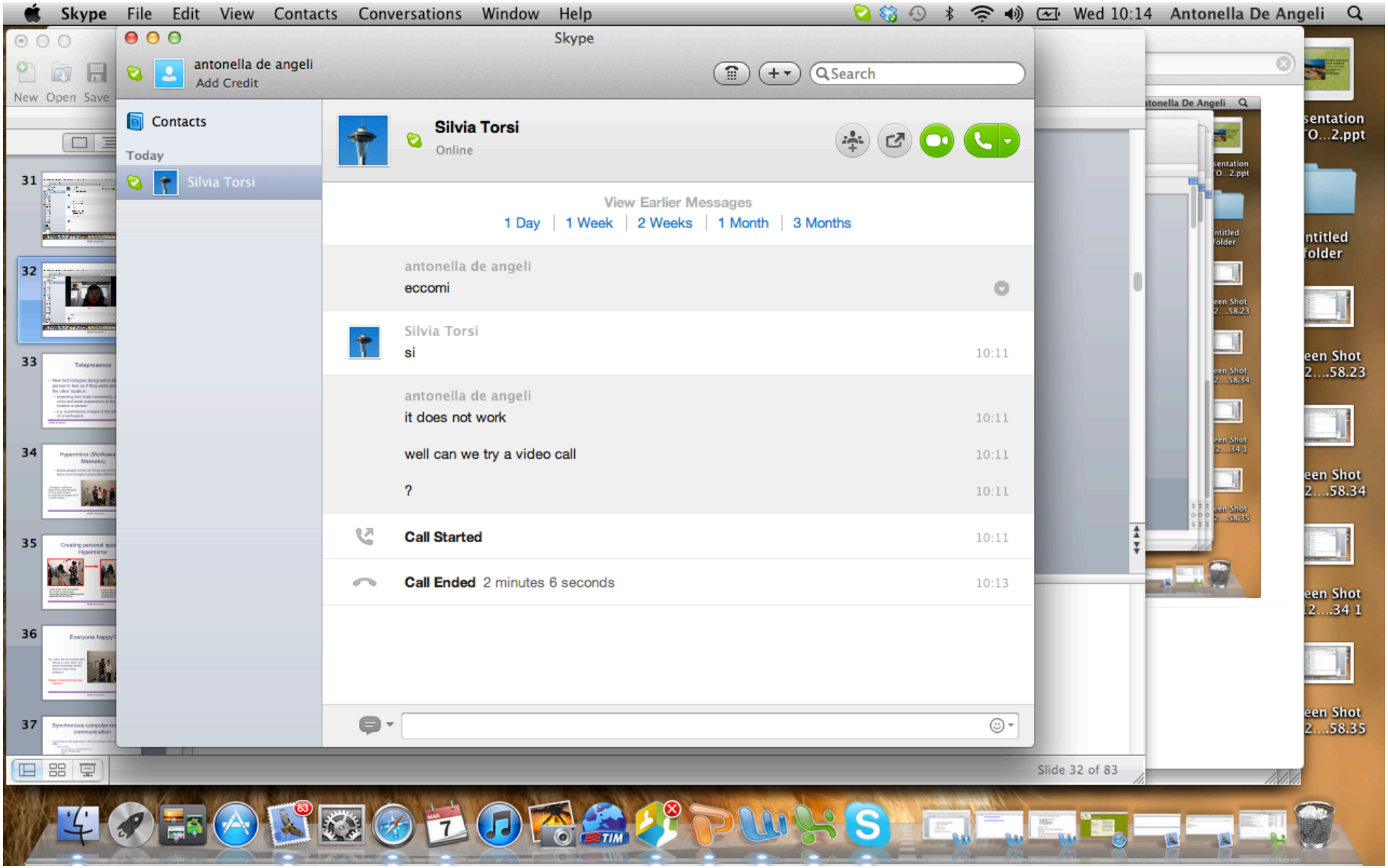
Slide 32 of 82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- Access Grid

- Very high quality audio
- Big display to enable full-size people shots and simultaneous viewing of all remote sites
- Multiple cameras to show groups and multiple viewpoints
- Collaborative software to enable remote participants to share and interact with data
- Usage of IP multicast, to enable bandwidth-efficient networking

# Telepresence

- New technologies designed to allow a person to feel as if they were present in the other location
  - projecting their body movements, actions, voice and facial expressions to the other location or person
  - e.g. superimpose images of the other person on a workspace

# Hypermirror (Morikawa and Maesako)

– allows people to feel as if they are in the same virtual place even though in physically different spaces

1) People in different places are superimposed on the same screen to make them appear as if in same space

(woman in white sweater is in a different room to the other three)

# Creating personal space in Hypermirror

**2) Two in this room are invading the 'virtual' personal space of the other person by appearing to be physically on top of them**

**3) Two in the room move apart to allow person in other space more 'virtual' personal space**

# Everyone happy?

No, when the two people start talking to each other, the person standing virtually between them feels awkward

# A telepresence room

# Collaborative virtual environments

The rooftop garden in BowieWorld, a Collaborative Virtual environment (CVE), supported by Worlds.com. Users take part by “dressing up” as an avatar. There are 100s of avatars to choose from, including penguins and real persons. Once an avatar has entered a world they can explore it and chat to other avatars.

Source: www.worlds.com/bowie

# Second life

- A virtual world with a separate economy
  - Virtual cities with shops, jobs
  - Spaces and bodies are bought for money
  - Virtual University – Red light district
- http://secondlife.com/

# 3D virtual worlds

- Second Life (2007)
  - Over 8 million users
- What kinds of conversation take place in these environments?

File Edit View Go Bookmarks Tools Help

http://secondlife.com/

Go

Resident Login | Join

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SECOND LIFE IS A 3D ONLINE DIGITAL WORLD IMAGINED, CREATED, & OWNED BY ITS RESIDENTS.

- BUY & SELL LINDEN DOLLARS
- OWN VIRTUAL LAND
- REFER FRIENDS

VIEW INTERACTIVE MAP

UNDER 18? CHECK OUT TEEN SECOND LIFE

## Second Life Viewer Goes Open Source

Have a hand in shaping the future of Second Life! Linden Lab announces the release of the Second Life viewer source code.

- Read the Linden Lab blog post
- Read the press release
- Check out our Open Source FAQ and more

| | |
|---|---|
| Total Residents: | 3,314,193 |
| Logged In Last 60 Days: | 1,136,702 |
| Online Now: | 17,027 |
| US$ Spent Last 24h: | $1,330,403 |
| LindeX Activity Last 24h: | $190,186 |

**Headlines** read more news...

CNET News.com
Sundance Holds Screening in Second Life

AP
Blogger Gets Un-Cease and Desist Note

NEW WORLD NOTES
Wagner James Au
reports first-hand from Second Life


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Where else can you help create a new world *and* have the time of your life doing it? Just visit our jobs page and follow the directions from there.

For even more info, read Philip Linden's recent blog post about why you should consider joining [illegible]

**Second Life Videos**

Check out resident-created Second Life videos at our media page.

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Virtual Worlds, Avatars, free 3D chat, online meetings – Second Life Official Site
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Like 240k
Login
Search
What Is Second Life?
World Map
Shopping
Buy Land
Community
Help
SECOND LIFE
Your World. Your Imagination.
Join Now
Have fun, flirt, or simply flaunt your creativity in a world where you can experience and create anything you can imagine.
Female Avatar by Juicy Littlething
Male Avatar by Mimi Juneau
What's Hot Now — Live Feed
FOXXIES Piano and Jazz Ballroom
Kingdom of Sand
Aphrodisiac
Demonic Night Club
What's your story?
Join the Second Life community and create a profile for your avatar. Join Now
Linden Realms
Find crystals, complete quests and earn currency — but don't get stomped! Visit Linden Realms
Affiliate Program
Second Life Marketplace
Second Life Blogs
Second Life Developers
Destination Guide
Download Second Life
Follow Us
Explore Second Life Through Our Destination Guide
To get started in Second Life, check out our Destination Guide where we highlight some of the most fun & noteworthy places to visit. From role-playing, to music, to virtual pets & chat hot spots, there's an experience for everyone.
Editors' Picks
Featured Events
Art
Adventure & Fantasy
Role-playing
Fantasy
Historical
Pirates
Pets & Animals
Real Life
Romance
Sports & Games

# Linden Dollar Exchange

Second Life has its own unit-of-trade, the Linden Dollar. Residents use their Linden Dollars to pay for goods and services provided by other Residents. The Linden Dollar can also be exchanged for U.S. Dollars and other foreign currencies on a number of different websites, including right here via the LindeX exchange.

## About Second Life's Linden Dollar Exchange

The LindeX is a Linden Dollar exchange offering residents of Second Life the ability to either buy or sell Linden Dollars. Charges are for purchasing Linden Dollars and are placed on the same form of payment you have setup in your account settings for your Second Life account. If you have a credit on your US$ account balance that credit will be applied first. Prices at this site are set by the market price - I.E. the best price offered by the different sellers of Linden Dollars.

BUY L$ SELL L$

For information about the LindeX and billing transaction limits please click here

NOTE: While the purchase of your Linden Dollars is done automatically and the Linden Dollars are delivered immediately and directly to your purchasing avatar's account, if you are logged in it may take a few minutes for the in-world database to synchronize with your account. Often travelling to another region or logging off and back in will cause the balance displayed in your viewer to update in a more timely fashion.

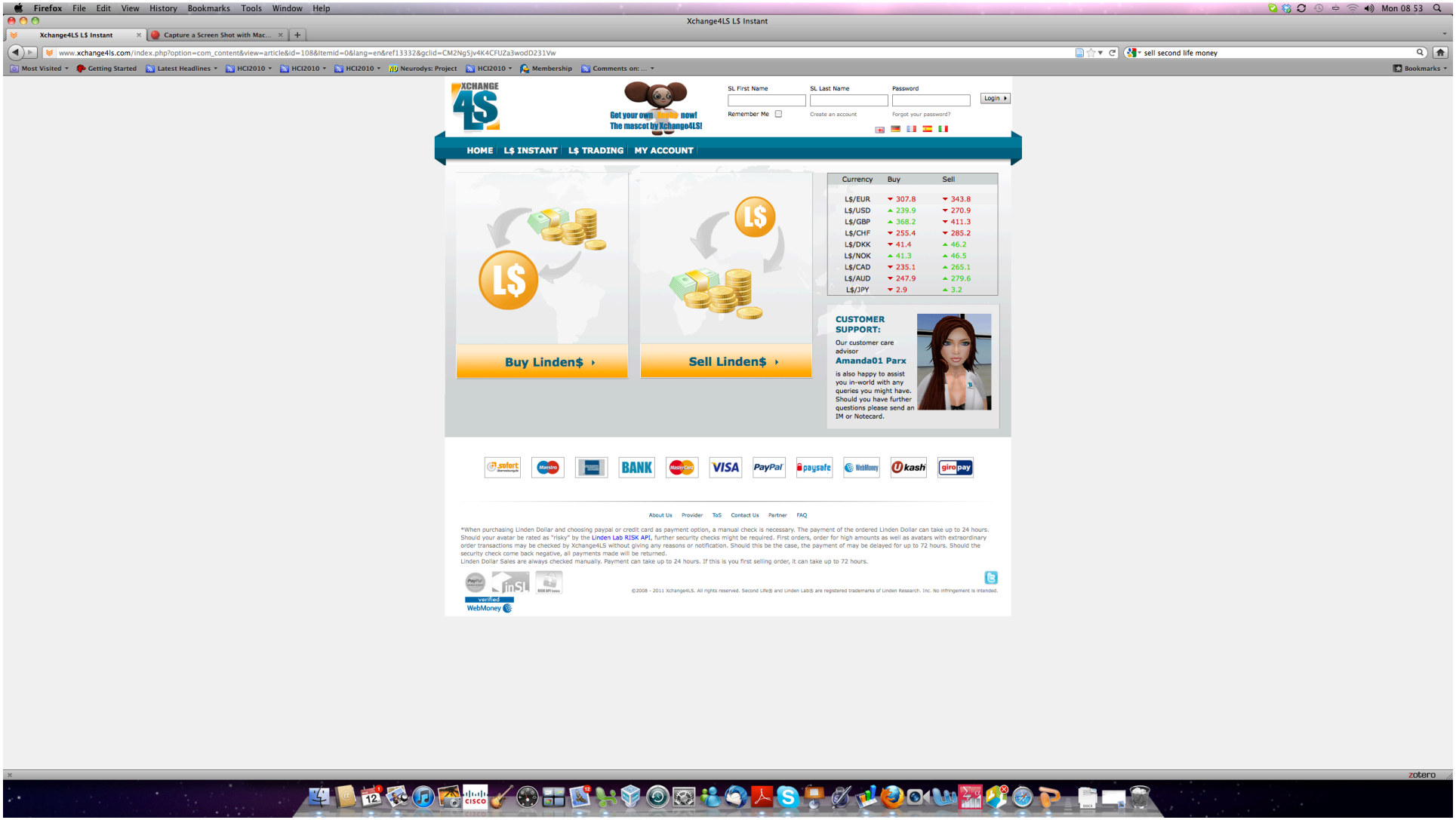
To see more information about **LindeX fees** and how credit on your US$ balance can be used click here.

## LindeX Automatic Circuit Breakers

LindeX features automatic "circuit breaker" trading halts based on movement (positive or negative) of the average exchange rate in any given day, as follows:

| | |
|---|---|
| > **10% in any 12-hour period:** | projected 1 hour halt |
| > **20% in any 12-hour period:** | projected 2 hour halt |
| > **30% in any 12-hour period:** | close until at least noon the following day |

Averages will be determined for these circuit breakers at least once per hour. We continue to reserve the right to halt LindeX at any time for maintenance, or to investigate system misuse or malfunction. In the event we determine any halt period to be unnecessary, we may recommence trading prior to the end of the posted halt period.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L$/USD 239.9 270.9
L$/GBP 368.2 411.3
L$/CHF 255.4 285.2
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L$/NOK 41.3 46.5
L$/CAD 235.1 265.1
L$/AUD 247.9 279.6
L$/JPY 2.9 3.2
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Amanda01 Parx
is also happy to assist you in-world with any queries you might have. Should you have further questions please send an IM or Notecard.
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*When purchasing Linden Dollar and choosing paypal or credit card as payment option, a manual check is necessary. The payment of the ordered Linden Dollar can take up to 24 hours. Should your avatar be rated as "risky" by the Linden Lab RISK API, further security checks might be required. First orders, order for high amounts as well as avatars with extraordinary order transactions may be checked by Xchange4LS without giving any reasons or notification. Should this be the case, the payment of may be delayed for up to 72 hours. Should the security check come back negative, all payments made will be returned.
Linden Dollar Sales are always checked manually. Payment can take up to 24 hours. If this is you first selling order, it can take up to 72 hours.
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WebMoney
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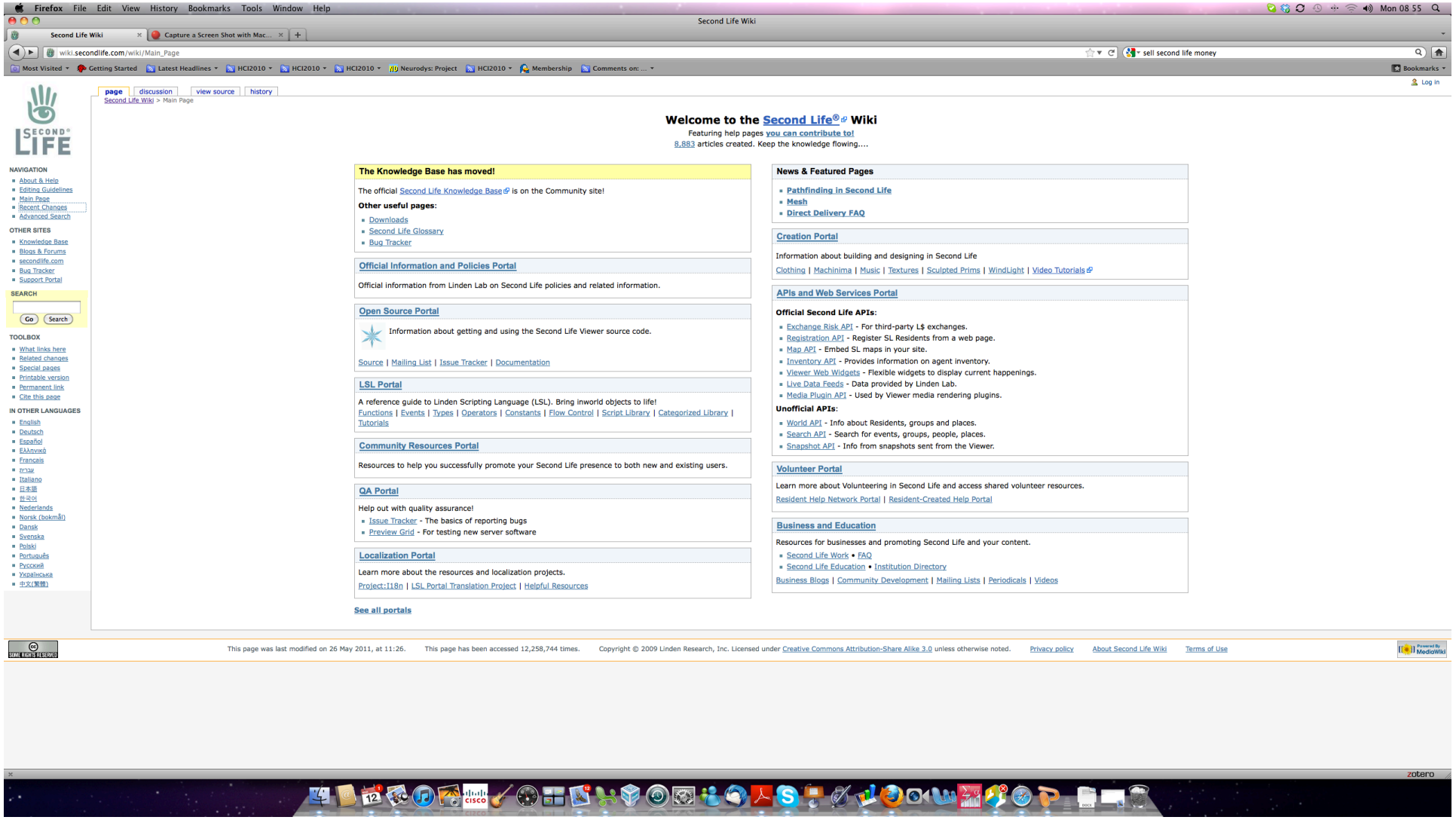
Second Life Wiki
wiki.secondlife.com/wiki/Main_Page
page
discussion
view source
history
Welcome to the Second Life® Wiki
Featuring help pages you can contribute to!
8,883 articles created. Keep the knowledge flowing....
The Knowledge Base has moved!
The official Second Life Knowledge Base is on the Community site!
Other useful pages:
Downloads
Second Life Glossary
Bug Tracker
Official Information and Policies Portal
Official information from Linden Lab on Second Life policies and related information.
Open Source Portal
Information about getting and using the Second Life Viewer source code.
Source | Mailing List | Issue Tracker | Documentation
LSL Portal
A reference guide to Linden Scripting Language (LSL). Bring inworld objects to life!
Functions | Events | Types | Operators | Constants | Flow Control | Script Library | Categorized Library | Tutorials
Community Resources Portal
Resources to help you successfully promote your Second Life presence to both new and existing users.
QA Portal
Help out with quality assurance!
Issue Tracker - The basics of reporting bugs
Preview Grid - For testing new server software
Localization Portal
Learn more about the resources and localization projects.
Project:I18n | LSL Portal Translation Project | Helpful Resources
See all portals
News & Featured Pages
Pathfinding in Second Life
Mesh
Direct Delivery FAQ
Creation Portal
Information about building and designing in Second Life
Clothing | Machinima | Music | Textures | Sculpted Prims | WindLight | Video Tutorials
APIs and Web Services Portal
Official Second Life APIs:
Exchange Risk API - For third-party L$ exchanges.
Registration API - Register SL Residents from a web page.
Map API - Embed SL maps in your site.
Inventory API - Provides information on agent inventory.
Viewer Web Widgets - Flexible widgets to display current happenings.
Live Data Feeds - Data provided by Linden Lab.
Media Plugin API - Used by Viewer media rendering plugins.
Unofficial APIs:
World API - Info about Residents, groups and places.
Search API - Search for events, groups, people, places.
Snapshot API - Info from snapshots sent from the Viewer.
Volunteer Portal
Learn more about Volunteering in Second Life and access shared volunteer resources.
Resident Help Network Portal | Resident-Created Help Portal
Business and Education
Resources for businesses and promoting Second Life and your content.
Second Life Work • FAQ
Second Life Education • Institution Directory
Business Blogs | Community Development | Mailing Lists | Periodicals | Videos
NAVIGATION
About & Help
Editing Guidelines
Main Page
Recent Changes
Advanced Search
OTHER SITES
Knowledge Base
Blogs & Forums
secondlife.com
Bug Tracker
Support Portal
SEARCH
Go
Search
TOOLBOX
What links here
Related changes
Special pages
Printable version
Permanent link
Cite this page
IN OTHER LANGUAGES
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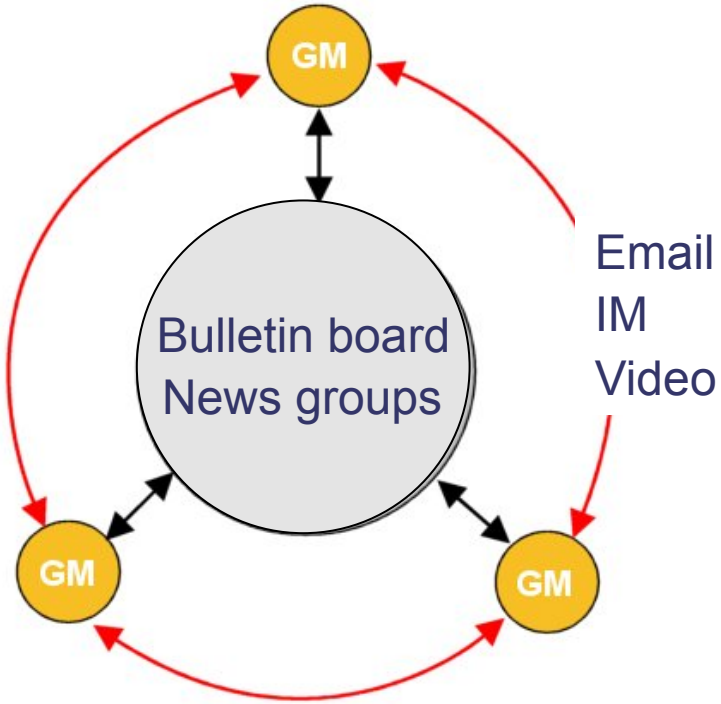
# Facebook and Twitter

- Used in emergencies, demos, etc.,
  - e.g., users spread up-to-the minute info and retweet about how a wildfire or gas plume is moving
  - but can also start or fuel rumors, by adding news that is old or incorrect
  - more confusing than helpful

# Asynchronous Communication

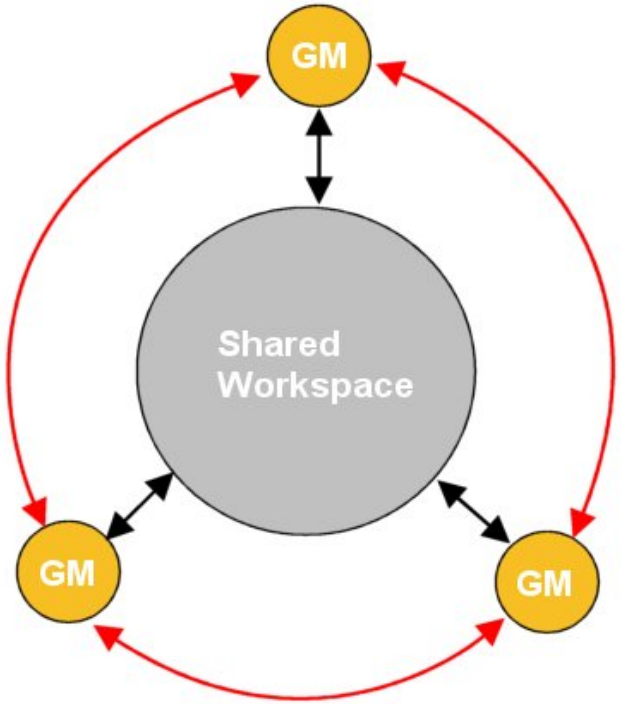
- Communication takes place remotely at different times
- Email, newsgroups, computer conferencing, IBM Babble
- Benefits include:
  - Read any place any time
  - Flexible as to how to deal with it
  - Powerful, can send to many people
  - Can make saying things easier
- Problems include:
  - FLAMING!!!
  - Spamming
  - Message overload
  - False expectations as to when people will reply

# Model of Groupware: Part 1




- Computer mediated communication
  - Peer-to-peer
  - Through shared space

# Model of Groupware: Part 2




- Coordination of shared workspace
  - Concurrency
  - Security/Access
  - Organisation
  - Awareness

# What should groupware do?

- Provide communication between group members
- Collaboration
  - Coordinate and control shared objects
  - Provide organisation and common understanding of the work processes and other people
  - Support decision making and problem solving

# Coordination mechanisms

- When a group of people act or interact together they need to coordinate themselves
  - e.g., playing football, navigating a ship
- They use:
  - verbal and non-verbal communication
  - schedules, rules, and conventions
  - shared external representations

# F2F coordinating mechanisms

- Talk is central
- Non-verbal also used to emphasize and as substitute
  - e.g. nods, shakes, winks, glances, gestures and hand-raising
- Formal meetings
  - explicit structures such as agendas, memos, and minutes are employed to coordinate the activity

- Video Arms
- http://grouplab.cpsc.ucalgary.ca/papers/videos/index.html

# Clearboard (Ishii et al, 1993)

– ClearBoard - transparent board that shows other person's facial expression on your board as you draw

# Shared Objects

- Collaborative editors
  - Asynchronous
    - Google documents
    - MSWord
    - Wikipedia
  - Synchronous
    - Google documents
    - Synchronous Asynchronous Structured Shared Editor (Sasse)
    - Shared Whiteboard (Clearboard)
    - Has to deal with problems of concurrency

# What should groupware do?

- Provide communication between group members
- Collaboration
  - Coordinate and control shared objects
  - Provide organisation and common understanding of the work processes and other people
  - Support decision making and problem solving

# Schedules, rules and conventions

- Schedules used to organize regular activities in large organizations
- Formal rules, like the writing of monthly reports enable organizations to maintain order and keep track
- Conventions, like keeping quiet in a library, are a form of courtesy to others

# Workflow management/ coordination systems

- Form based systems
  - Model the dataflow within organisations
- Calendar systems
  - Contingency checking
- Workflow systems
  - Automate business process
  - Automatically implement policies and best practice

# Shared external representations

- Common method used to coordinate collaborative activities,
  - e.g., checklists, tables, to-do lists
- They can provide external information on:
  - who is working on what
  - When it is being worked on
  - where it is being worked on
  - when a piece of work is supposed to be finished
  - whom it goes to next

# Technologies to support coordination

- There are a variety of software tools designed to support scheduling, planning and coordinating
  - e.g., group calendars, electronic schedulers, project management tools, and workflow tools
- Need to get balance between human and system control
  - too much system control and the users will rebel
  - too little control and the system breaks down

# What should groupware do?

- Provide communication between group members
- Collaboration
  - Coordinate and control shared objects
  - Provide organisation and common understanding of the work processes and other people
    - Awareness support
  - Support decision making and problem solving

# Decision Making

- Business Intelligence Tools
- Multi-Dimensional Analysis
- Data Mining
- Information Visualisation
  - Spotfire

# Awareness mechanisms

- Involves knowing who is around, what is happening, and who is talking with whom
- Peripheral awareness
  - keeping an eye on things happening in the periphery of vision
  - Overhearing and overseeing - allows tracking of what others are doing without explicit cues

# Summary

- Groupware is used to support COMMUNICATION and COLLABORATION
- F2F Social mechanisms needs to be embed or extended
- Keeping aware of what others are doing and letting others know what you are doing are important aspects of collaborative working and socialising

# Further Reading

- Sharp, Rogers and Preece – Interaction Design, 2012, Chapter 4