

# The Role of User Centered Design Process in Understanding Users

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**Elsevier**  
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# Agenda

- User Centered Design: what is it and why is it important?
- User Centered Design at Elsevier
- The User Centered Design Process
- Scopus Case Study

# User Centered Design Defined

- An approach to designing usefulness and ease of use into the total customer experience with products and systems.
- A design philosophy in which the emphasis is on the user and through which a high level of is achieved.
- A typical UCD process has three major phases of the work – understanding, design and evaluation with iterations that cycle between each phase.
- Focuses on usefulness, ease of use, ease of

# Always remember...

“What people **say**,  
what people **do**, and  
what they **say they do**  
are entirely different  
things.”

-- Margaret Mead  
*Anthropologist*

## Examples:

Predicting sales of  
mail-order cosmetics



Automobile  
design



# UCD at Elsevier



# Elsevier Offices



Amsterdam,  
The Netherlands



Dayton, Ohio, USA



London, England,  
United Kingdom



New York, New  
York, USA

# Usability Labs at Elsevier

- Usability Labs in offices in London, Amsterdam, Philadelphia, Dayton, Texas, St. Louis. More labs be added next year
- Ability for recording sessions
  - Picture-in-picture of customer interacting with product
  - Audio/video recoding of focus group & group interactions
- The usability lab has an observation room for involvement & opportunities to watch customers first hand interact with products.



# Elsevier's UCD-related publications



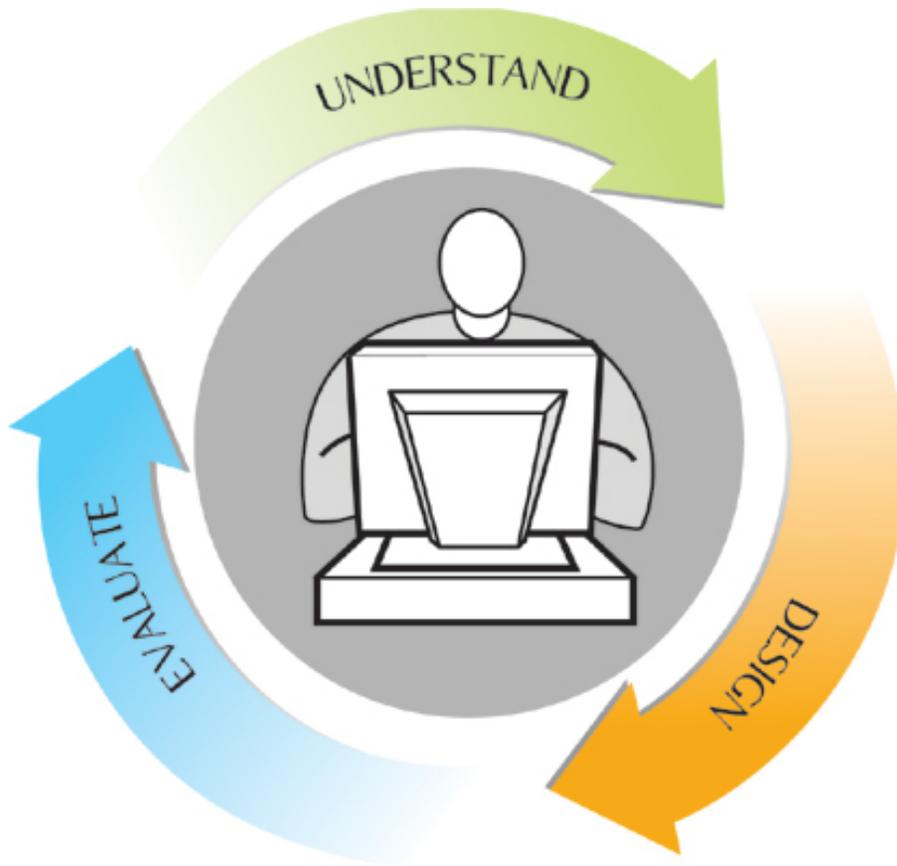
# Mission

Utilize user-centered design principles to help create **easy-to-use** electronic products that **user satisfaction** and **meet business needs**.

As members of product teams we work to:

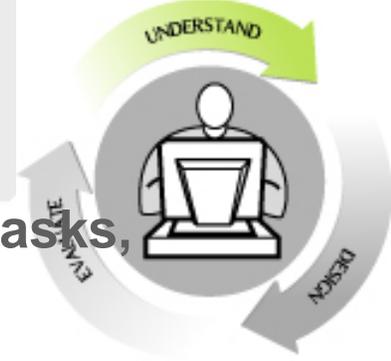
- ***Understand*** users, their tasks, and their work environments
- ***Design*** user interfaces that enable users to achieve their goals efficiently
- ***Evaluate*** product designs with users throughout the product lifecycle

# Standard User Centered Design Process



- For best results begin as early as possible the product development cycle
- Iterative and rapid ... allows for quick changes
- Work with product management, developers ... and users!

# Understand



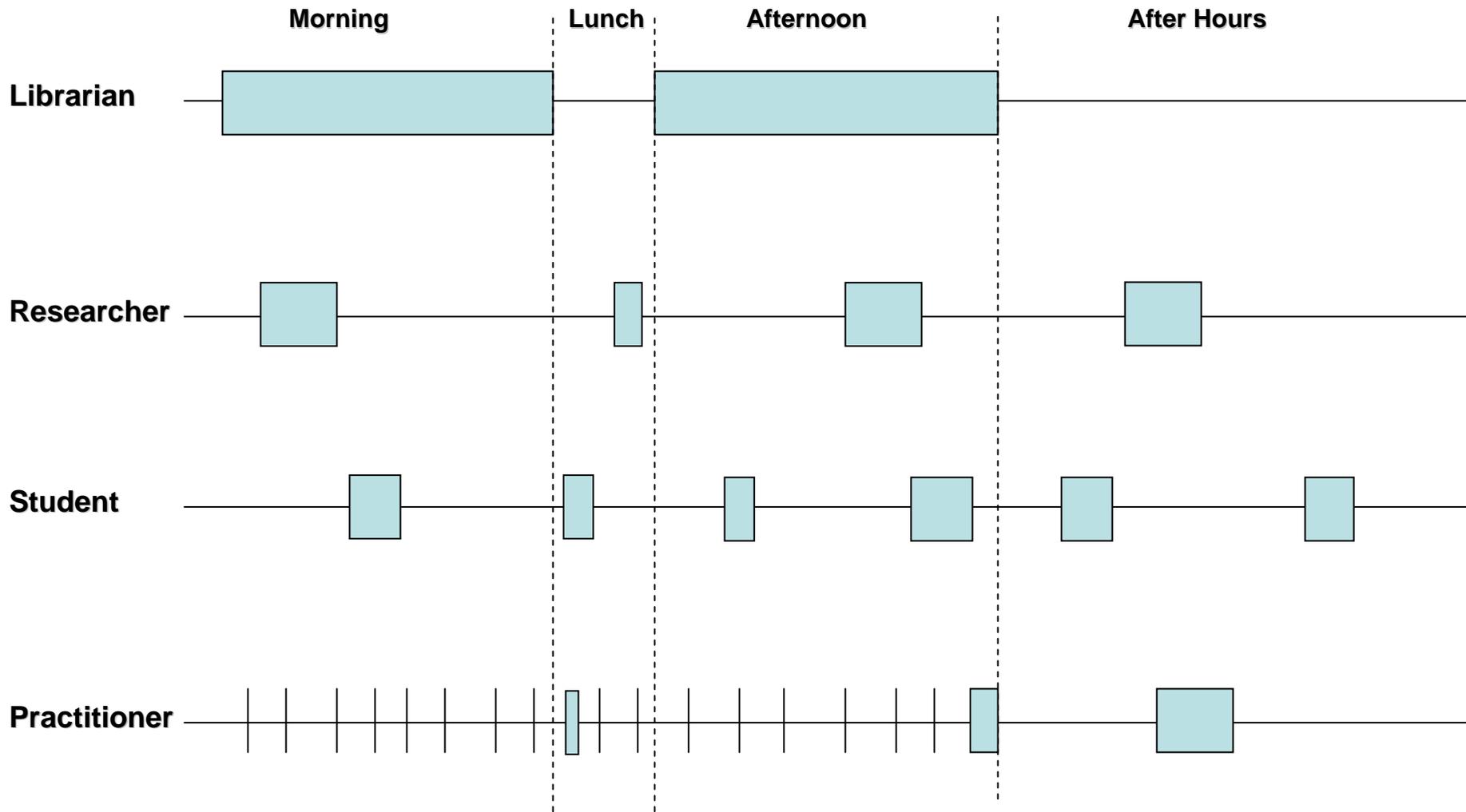
- **This is the most important step: Know the user, their tasks, their goals**
  - What informational resources do they currently use?
  - What are their organizations procedures?
  - What other tools and people do they work with?
  - What are their key job tasks and how do they accomplish them?
  - What problems do they encounter daily?
- UCD Deliverables in this phase include:
  - Visiting Users
    - Observations / Interviews
      - Field Studies
  - User Profiles / User Modeling
  - Online Questionnaires
  - Competitor Analysis (UI & functionality)

# Understanding / Modeling Users

- Involve users early and often
- Identify target user group
- Investigate users, their work, and their research, interviews, questionnaires, etc.
- Analyse data to identify priorities
- Organize data in various formats

# Electronic Information Retrieval

## - A Day in the Life -



Significant generalizations; Use of Elsevier electronic products is much smaller

# Field Study - a deeper understanding of user information behavior



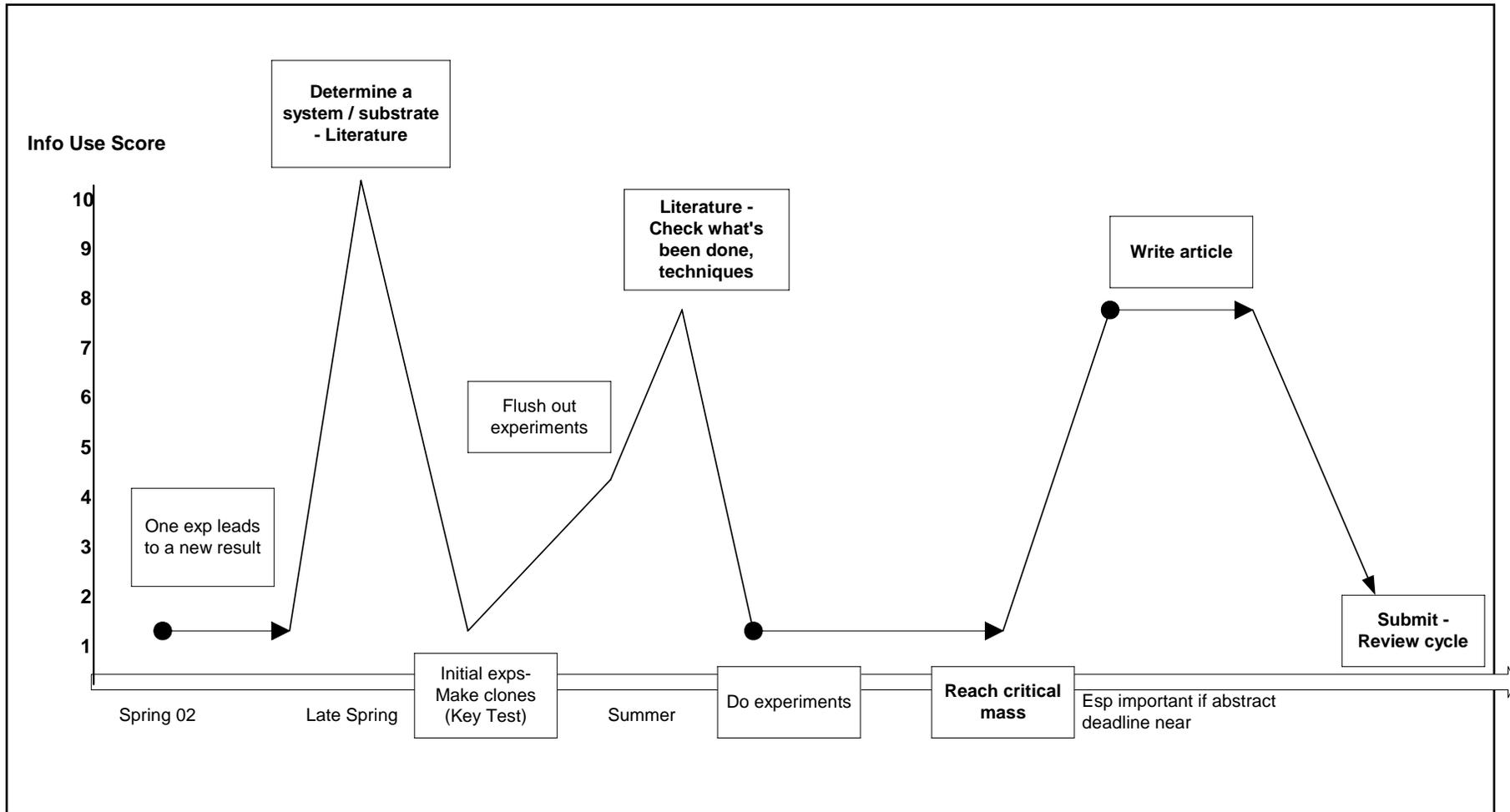
# Goals of Field Study

- Understand how scientists in different disciplines seek & use information in the research context
- Gather field data to build frameworks for analyzing research info-seeking, for learning about users & better product
- Inform direction & decision-making for new products
- Reduce development risks by deeply understanding information use across disciplines

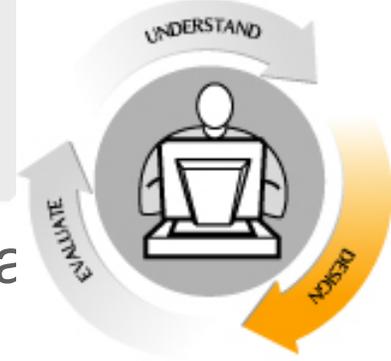


A typical desk – Limited space for information work

# Typical Lifecycle of Research “Project” (Where 4 of these activities are located)



# Design



- Design to fit the user and their tasks ensuring they can efficiently and easily complete the tasks
- Decisions based on user data
- Basic Design Principles are followed:
  - Simple good, complex bad
  - Consistency
  - User orientation
  - Aesthetics (graphics)
  - Accessibility
  - User Control (undo, exit)
  - Task Efficiency
  - Clear visual presentation
- UCD Deliverables in this phase include:
  - Executive summaries
  - UI Prototype
  - Visual Design
  - UI Specification
  - UI Style Guide

# Does Design Matter?



vs.



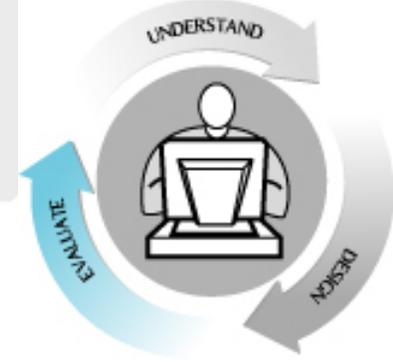
# Does Design Matter?

- Fast Company; June 2005
  - Masters of Design-Special Issue
- Business 2.0; April 2005
  - Bottom Line Design Awards
- Business Week; May 17, 2004
  - The Power of Design
- Forbes, The Economist, Financial Times, Strategy+Business, Harvard Business Wall Street Journal, Forrester...

# Organizations emphasizing Design

- Apple
- Disney
- Charles Schwab
- Nike
- Herman Miller
- FedEx
- Microsoft
- Coca Cola
- Target
- Intel
- Google
- Whirlpool
- Proctor & Gamble
- Samsung
- Sony
- Dell
- BMW
- Ikea
- H&M
- Steelcase
- Bose
- Segway

# Evaluate



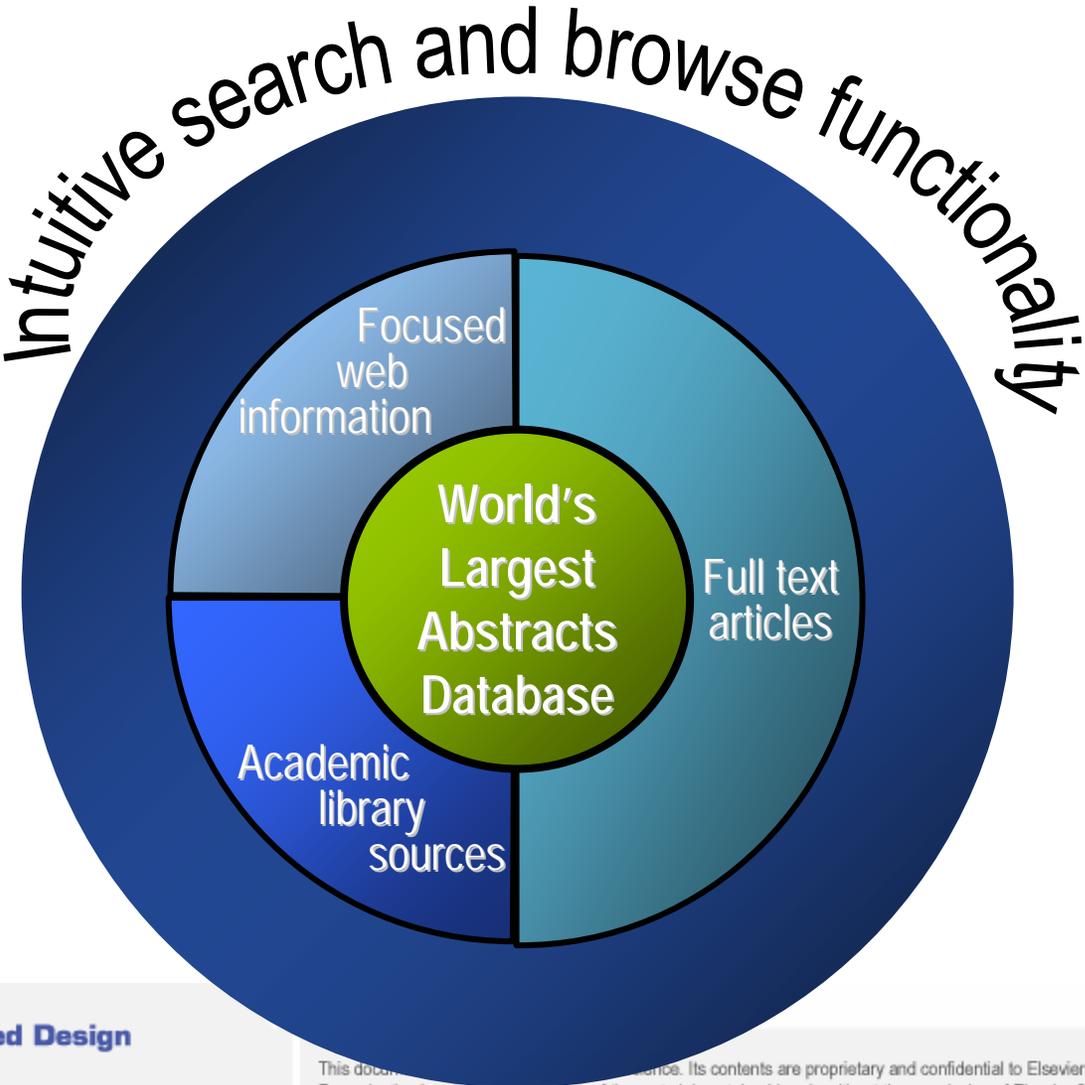
- Evaluate the User Interface, not the user
- Key measures
  - Efficiency
  - Effectiveness, Error Rate
  - Satisfaction
- UCD Deliverables include:
  - Usability testing (observations)
  - Competitive testing
  - Usability inspection
  - Online questionnaire (opinions)
  - Web log / usage analysis
  - **Usability testing is a key method of validating our product with customers**

# SCOPUS

How the User Centered Design  
Process was used to Understand the  
User in the Development of a  
Customer Focused Product

A CASE STUDY

# SCOPUS: A New Navigation Tool



# Benefits of evidence-based design

- Improves the user experience
- Ensures that what is developed is useful
- Gives ownership where it belongs: the eventual users
- Reduces the need for librarians to train users on the products they buy

# Development Partners

- New program where Elsevier partners with users involve them throughout the design process
- 21 institutions, 300 researchers/librarians, 4 continents, 15 user test sessions conducted
- Includes involvement through
  - Field studies
  - Interviews
  - Observation activities
  - Usability Testing
  - Surveys/questionnaires
  - Focus groups

# Major Tasks of Researchers

- Finding (new) articles in a familiar subject field
- Finding author-related information
  - Articles by a specific author
  - Information that would help in evaluating a specific author
- Author contact information
- Staying up-to-date
- Getting an overview or understanding of a new subject field

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Results list (sorted by date)

Select	Year	Title	Author(s)	Journal	Cited	Type
1. <input type="checkbox"/>	2000	Improved modelling and assessment of pneumatic muscle actuators	<a href="#">Tsagarakis N.</a> , <a href="#">Caldwell Darwin G.</a>	<i>Proceedings - IEEE International Conference on Robotics and Automation</i> 4 ((not recorded)), pp. 3641-3646	0	<a href="#">Record</a>
2. <input type="checkbox"/>	2000	Bio-mimetic actuators: Polymeric Pseudo Muscular Actuators and pneumatic Muscle Actuators for biological emulation	<a href="#">Caldwell Darwin G.</a> , <a href="#">Tsagarakis N.</a> , <a href="#">Medrano-Cerda G.A.</a>	<i>Mechatronics</i> 10 (4), pp. 499-530	0	<a href="#">Record</a>

Information grouped by Year, Author, Affiliation, Journal Title, based on the first 2 results

Occurrences of 1 are not shown (click here to [show all](#))

Year	Author	Affiliation	Journal Title
2:( <a href="#">not</a> ) <a href="#">2000</a>	2:( <a href="#">not</a> ) <a href="#">Caldwell Darwin G.</a> 2:( <a href="#">not</a> ) <a href="#">Tsagarakis N.</a>	2:( <a href="#">not</a> ) <a href="#">Univ of Salford</a>	

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1. <input type="checkbox"/>	2002	Results of chronic subthalamic nucleus stimulation for Parkinson's disease: A 1-year follow-up study <a href="#">Abstract + Links</a>   <a href="#">Full Text</a>	<a href="#">Vesper J.</a> , <a href="#">Klostermann F.</a> , <a href="#">Stockhammer F.</a> , <a href="#">Funk Th.</a> , <a href="#">Brock M.</a>	<i>Surgical Neurology</i> 57 (5), pp. 306-311	0
2. <input type="checkbox"/>	2002	High-frequency stimulation of the subthalamic nucleus selectively reverses dopamine denervation-induced cellular defects in the output structures of the basal ganglia in the rat. <a href="#">Abstract + Links</a>	<a href="#">Salin P.</a> , <a href="#">Manrique C.</a> , <a href="#">Forni C.</a> , <a href="#">Kerkerian-Le Goff L.</a>	<i>The Journal of neuroscience : the official journal of the Society for Neuroscience</i> 22 (12), pp. 5137-5148	0
3. <input type="checkbox"/>	2002	New strategies in the treatment of the advanced Parkinson's disease <a href="#">Abstract + Links</a>	<a href="#">Odin P.</a> , <a href="#">Mrowka M.</a>	<i>Nervenheilkunde</i> 21 (4), pp. 174-177	0
4. <input type="checkbox"/>	2002	Subthalamic nucleus stimulation for Parkinson's	<a href="#">Katayama Y.</a> , <a href="#">Oshima H.</a>	<i>Japanese Journal of Neurosurgery</i>	0

# Evolution of the Refine Results box

## March 2003

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50 results for: TITL-ABS-KEY-AUT(parkinson)

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Source Title	Author Name	Year	Document Type	Subject Area
<input type="button" value="limit to"/> <input type="button" value="exclude"/>	<input type="button" value="limit to"/> <input type="button" value="exclude"/>	<input type="button" value="limit to"/> <input type="button" value="exclude"/>	<input type="button" value="limit to"/> <input type="button" value="exclude"/>	<input type="button" value="limit to"/> <input type="button" value="exclude"/>
<input type="checkbox"/> Neurochemistry International (5)	<input type="checkbox"/> Nishiguchi, Mariko (3)	<input type="checkbox"/> 2003 (4)	<input type="checkbox"/> Article (39)	<input type="checkbox"/> Biology, Agriculture and Environmental Science (18)
<input type="checkbox"/> Neurobiology of Aging (4)	<input type="checkbox"/> Braak, Heiko (2)	<input type="checkbox"/> 2002 (15)	<input type="checkbox"/> Review (5)	<input type="checkbox"/> Chemistry (12)
<input type="checkbox"/> Physica A: Statistical Mechanics and its Applications (2)	<input type="checkbox"/> Gomez-Isla, Teresa (2)	<input type="checkbox"/> 2001 (12)	<input type="checkbox"/> Conference Paper (2)	<input type="checkbox"/> Psychology (12)
<a href="#">More...</a>	<a href="#">More...</a>	<a href="#">More...</a>	<a href="#">More...</a>	<a href="#">More...</a>

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results 1 - 25

	Year	Document Title	Author(s)	Source Title	Cited By
1. <input type="checkbox"/>	2003	<b>Increase in secretion of glial cell line-derived neurotrophic factor from glial cell lines by inhibitors of vacuolar ATPase</b>	<a href="#">Nishiguchi, Mariko</a> , <a href="#">Tokugawa, Kimiko</a> , <a href="#">Yamamoto, Kyoko</a> , <a href="#">Akama, Tomoko</a>	<i>Neurochemistry International</i> 13 (1), pp. 99-104	0
		<input type="button" value="Abstract + Refs"/> <input type="button" value="Full Text"/> <input type="button" value="Image Link"/>			
2. <input type="checkbox"/>	2001	<b>Staging of brain pathology related to sporadic Parkinson's disease</b>	<a href="#">Braak, Heiko</a> , <a href="#">Gomez-Isla, Teresa</a> , <a href="#">Rüb, Udo</a> , <a href="#">Jansen, N.H. Ernst</a> , <a href="#">Braak, Eva</a>	<i>Neurobiology of Aging</i> 13 (1), pp. 99-104	<a href="#">2</a>
		<input type="button" value="Abstract + Refs"/> <input type="button" value="Full Text"/>			
3. <input type="checkbox"/>	2000	<b>Motor dysfunction and gliosis with preserved dopaminergic markers in human -synuclein A30P transgenic mice</b>	<a href="#">Magge S.N.</a> , <a href="#">Westerveld, M.</a> , <a href="#">Pruzinsky, T.</a> , <a href="#">Persing, J.A.</a>	<i>Journal of Craniofacial Surgery</i> 13 (1) nn 99-104	0

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1. <input type="checkbox"/> 1995	<b>Failure of blood-island formation and vasculogenesis in FIK-1 deficient mice</b> <input type="button" value="Abstract + Refs"/> <input type="button" value="View at Publisher"/> <input type="button" value="Full Text"/>	<a href="#">Shalaby, F.</a> , <a href="#">Rossant, J.</a> , <a href="#">Yamaguchi, T.P.</a> , <a href="#">Gertsenstein, M.</a> , <a href="#">Wu, X.-</a> <a href="#">F.</a> , <a href="#">Breitman, M.L.</a> , <a href="#">Schuh, A.C.</a>	<i>Nature</i> 376 (6535) , 62-66	<a href="#">1113</a>
2. <input type="checkbox"/> 1995	<b>An antidiabetic thiazolidinedione is a high affinity ligand for peroxisome proliferator-activated receptor <math>\gamma</math> (PPAR<math>\gamma</math>)</b> <input type="button" value="Abstract + Refs"/> <input type="button" value="View at Publisher"/> <input type="button" value="Full Text"/>	<a href="#">Lehmann, J.M.</a> , <a href="#">Moore, L.B.</a> , <a href="#">Smith-Oliver, T.A.</a> , <a href="#">Wilkison, W.O.</a> , <a href="#">Willson, T.</a>	<i>Journal of Biological Chemistry</i> 270 (22) , 12953-12956	<a href="#">1109</a>

# How Evidence-based Development Changed Product

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<input type="checkbox"/> Journal of Urology (10)	<input type="checkbox"/> Antoni, M.H. (10)	<input type="checkbox"/> 2002 (32)	<input type="checkbox"/> Review (246)	<input type="checkbox"/> Agricultural and Biological Sciences (460)
<input type="checkbox"/> Circulation (8)	<input type="checkbox"/> Hachamowitch, R. (10)	<input type="checkbox"/> 2001 (101)	<input type="checkbox"/> Conference Paper (98)	<input type="checkbox"/> Life Sciences (228)

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Date	Document (Sort by relevance)	Author(s)	Source Title	Cited by
1. <input type="checkbox"/> 2001	<b>Comparison of early invasive and conservative strategies in patients with unstable coronary syndromes treated with the glycoprotein IIb/IIIa inhibitor tirofiban</b> <a href="#">Abstract + Refs</a> <a href="#">View at Publisher</a>	<a href="#">Cannon, C.P.</a> , <a href="#">Weintraub, W.S.</a> , <a href="#">Demopoulos, L.A.</a> , <a href="#">Vicari, R.</a> , <a href="#">Frey, M.J.</a> , <a href="#">Lakkis, N.</a> , <a href="#">Neumann, F.-J.</a> , (...), <a href="#">Braunwald, E.</a>	<i>New England Journal of Medicine</i> 344 (25), 1879-1887	412
2. <input type="checkbox"/> 1996	<b>Complete sequence analysis of the genome of the bacterium <i>Mycoplasma pneumoniae</i></b> <a href="#">Abstract + Refs</a> <a href="#">View at Publisher</a>	<a href="#">Himmelreich, R.</a> , <a href="#">Hilbert, H.</a> , <a href="#">Plagens, H.</a> , <a href="#">Pirkil, E.</a> , <a href="#">Li, B.-C.</a> , <a href="#">Herrmann, R.</a>	<i>Nucleic Acids Research</i> 24 (22), 4420-4449	363
3. <input type="checkbox"/> 1996	<b>Coronary artery calcification: Pathophysiology, epidemiology, imaging methods, and clinical implications. A statement for health professionals from the American Heart Association</b> <a href="#">Abstract + Refs</a> <a href="#">Full Text</a>	<a href="#">Wexler, L.</a> , <a href="#">Brundage, B.</a> , <a href="#">Crouse, J.</a> , <a href="#">Detrano, R.</a>	<i>Circulation</i> 94 (5), 1175-1192	305

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Cited-by: how to get attention of the user?

Non-intrusive versus “in-their-face”

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s in **visual feedback** with practice

learning, the focus has been on the effect of modifying **feedback**. Its suggest that learning is specific to the practiced conditions and n practice. In a replication and extension of this previous work, 3 a sequential positioning movement: Controls performed 300 trials automatic **feedback**, whereas the other 2 groups, low practice (LP) or ectively, 50 or 300 trials without **feedback**. Pretest and posttest formed with the on- line **feedback**. All groups improved with HP group exhibited more of a performance decrement in the ggesting that motor learning is the process of forming an increasingly n. These results have implications for motor learning paradigms, ing.

ng; **Visual feedback**

**Citations**

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- [. Rosenbaum, D.A., Chaiken, S.R.](#)  
**Frames of reference in perceptual-motor learning: Evidence from a blind manual positioning task**  
(2001) *Psychological Research*  
Abstract + Refs
- [. Shea, C.H., Wright, D.L.](#)  
**Physical and observational practice afford unique learning opportunities**  
(2000) *Journal of Motor Behavior*  
Abstract + Refs
- [. Shea, C.H., Wulf, G.](#)  
**Enhancing motor learning through external-focus instructions and feedback**

# How Evidence-based Development Changed the Product

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1 (1994) Lead sulfate precursor to...	5				2	3	5
2 (1995) Effect of substrate bias...	8	7	1				8
3 (1995) Automating some analysis ...	5		3	2			5

# Reactions during trials and roll-out: users

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in Science  
I c

thinking:  
me time.  
ful tool !

**formidable outil!!!**

Je viens  
découvrir sc  
Très très utile, formid

# What the Librarians said

the system works the way  
the researcher uses abstract and  
citation data - that the way that we  
think that they should use it. At the  
University of Toronto there is no  
question that Scopus will not only  
become a key information source for  
science, technology and medicine but  
also supplant some of the more  
traditional information sources.

*Marshall Clinton*

*Director, Information Technology  
Services*

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impressed by the

Scopus user

interface. It is

clear

what kind of

products you

get and how you

can manipulate

the results lists.

It's very

user-friendly.

It is my  
Scopus is  
to search  
one stop  
shop  
and you  
always  
get  
relevant  
results,  
more  
always  
useful.

# Understand the User

If you would like further information on how to understand the user or the User Centered Design Process, please contact me at:

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