CONFERENCE PROGRAM & ABSTRACTS

EARLI SIG 2 CONFERENCE 2024

Comprehension of Text and Graphics: from Human to Artificial Intelligence

September 4th- 6th, 2024 | Valencia, Spain

Please note that the conference program is subject to change.
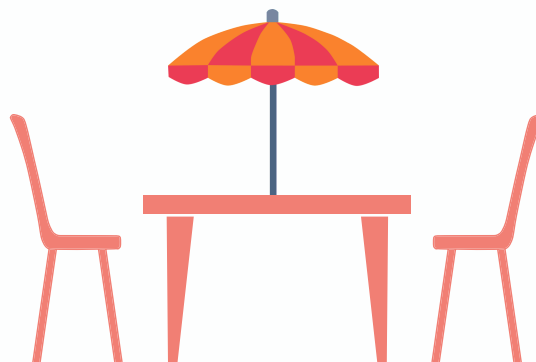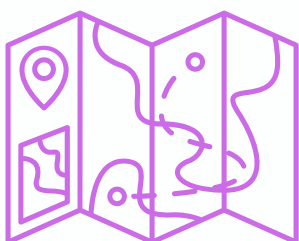
Tuesday, September 3rd

19.00-21.00h

PRE-CONFERENCE GET-TOGETHER

Before the official start of the EARLI SIG2 Conference 2024, we want to invite you to a pre-conference get-together. Participants of the **ERI-Lectura Summer School** are also welcomed!

Whether this marks your inaugural attendance at the SIG2 conference or you are already acquainted with some attendees, this presents an excellent opportunity to meet in an informal setting, have a great time, and explore **Valencia**!

We would like you to join us in a **guided-tour** around Valencia which will include some **dynamic and cooperative** games/puzzles (free of charge). Following the tour, we will relax on a terrace, where you can have some drinks and try our famous "tapas" (these expenses will <u>not</u> be covered). This concept is known in Valencia as "tardeo" (because it takes place in the evening, which in Spanish is "tarde").

More information will be provided after confirming your attendance.

Wednesday, September 4th

13.00 - 14.00	**Conference registration**
14.00 - 14.30	**OPENING CEREMONY**
14.30 - 15.30	**Key-note:** Carolien A.N. Knoop-van Campen *Eye see how you are reading: Reading comprehension behavior in typical and atypical readers across multimedia contexts*
15.30 - 15.45	**SHORT BREAK**

PARALLEL SYMPOSIA SESSION I

15.45 - 17.15

A. Evaluating Online Resources: Cognitive Foundations and Educational Interventions

Discussant: Carita Kiili - Chair: Nicolae Nistor

Expanding the CORE Framework: A Systematic Review Across Discipline and Age Group
Elena Forzani, Julie Corrigan*

Cognitive Scripts Towards Information (Il) Literacy: An Interview Study
Nicolae Nistor*, Dilara Isik, Nora Krasniqi

Effects of Lateral Reading and Analytical Reading on students' evaluation of information reliability
Fethi Boutelaa, Gastón Saux, Mônica Macedo-Rouet*

Cultivating sourcing and corroboration skills in a teacher-led program for lower secondary students
Philipp Marten, Sandra Assmann, Marc Stadtler*

B. Comprehension in atypical readers: the cases of deafness and autism (Invited symposium EARLI SIG15)

Discussant: Eliane Segers - Chair: David Saldaña

Factors underpinning deaf-and-hard-of-hearing children's poor reading comprehension
Barbara Arfé*, Gaia Spicciarelli, Marco Gubernale, Rosamaria Santarelli, Pietro Scimemi, Elisabetta Genovese, Edoardo Arslan

Hearing but not deaf adults pre-activate phonological features of words during reading comprehension
Eva Gutierrez-Sigut,* Katherine Rowley, Ixone Saenz-Paraiso, Marta Vergara Martinez, Manuel Perea, Mairéad MacSweeney

Idiom processing advantage in students with autism spectrum disorder: An eye-movement research
Nadina Gómez-Merino, Antonio Ferrer, Ana García-Blanco, Alejandro Téllez, Inmaculada Fajardo*

Strategic reading behaviour and executive function in readers with autism
David Saldaña*, Pablo Delgado, Gema Erena-Guardia, Miriam Rivero-Contreras, Nuria Calet, Gracia Jiménez-Fernández, Francisco Javier Moreno-Pérez, Isabel R. Rodríguez-Ortiz

17.15 - 17.45	**COFFEE BREAK**

Wednesday, September 4th

POSTER SESSION I

17.45 - 18.45

1. The role of tasks in the comprehension of multiple texts: a scoping review
Mariola Giménez-Salvador*, Raquel Cerdan

2. Multimedia lesson on computer viruses: Examining three design principles among 8-year-olds
Cyril Brom*, Tereza Hannemann, Filip Děchtěrenko

3. Concept Learning with Pictures and Concept Maps: Language Background and Affective Effects
Yen Na Yum, Phillip Holcomb, Katherine Midgley, Neil Cohn, Jie Wang, Hei Yuen Dawn Lau*

4. Descriptive and depictive representations for learning the lead role in partnered dances
Erica de Vries*

5. Visual strategies when working with circuit diagrams
Stefanie Peter*, Olaf Krey

6. Effect of congruent musical background on multimedia learning: a seductive detail effect ?
Laure Léger*, Emmanuel Schneider

7. Can we foster evaluation of reliable from false information using worked examples?
Nina Udvardi-Lakos*, Lisa , Tino Endres, Alexander Renkl

8. Comprehension of text and graphics in the 21st century: Development of a data literacy test
Cornelia Schoor*, Kathrin Lockl, Jutta von Maurice, Ilka Wolter, Cordula Artelt

9. Teachers' perception of quality in novice writers' texts: an eye-tracking study
Jana Gürtler*

10. The support of graphics to the comprehension of a text that refutes misinformation on climate change
María García Serrano*, Rubén Delgado Álvarez , J. Ricardo García Pérez, Javier Rosales

11. LAMMP: A layered model to investigate multimedia assessment items
Andrienne Kerckhoffs*, José Janssen, Ron Pat-El, Halszka Maria Jarodzka

12. Delaying elaborated feedback: The role of summative and question-based feedback
Carmen Candel*, Ignacio Máñez, Raquel Cerdan, Eduardo Vidal-Abarca

13. Ratings of emotion by children aged 9 to 13 during text reading: a developmental study
Sabine Fevin*, Elise Tornare, Christine Ros, Nicolas Vibert

14. Using Eye-Tracking to Detect the Comprehensibility of Questionnaire Items
Nada Zahra Pohl*, Heiko Schmidt, Dagmar Kern, Steffen Gottschling, Yvonne Kammerer

15. Predetermination of Visual Representation Type Influences Students' Performance and Cognitive Load
Katrin Schuessler*, Michael Giese, Maik Walpuski

16. The effects of timing and elaborateness of feedback on 5th grade students' learning from text
Elise Swart*, Ignacio Máñez, Daniel Garcia-Costa

17. Comparing Concept Map, Summary, Animations, Pictures & Prior Knowledge in Hypertext Comprehension
Christine Fabre*, Franck Amadieu, Lucie Bouvet

18. Beyond Implicit Theories of Intelligence : Enhancing Learning from Errors in Multimedia Education
Mariyem Ahmida*, Laure Léger

18.45 - 19.45

NEW

Welcome cocktail 🎉

Thursday, September 5th

8.45 - 10.15

SINGLE SESSION: **Advances in text comprehension and graphics I**

Exploring students' trust in generative AI: Impact of verbal anthropomorphism & contextual relevance
Juliane Richter*, Olivia Abt, Natascha Clauser, Hannah Patzelt

Using scenario-based assessment in post-secondary education
John Sabatini*, Daniel Feller, John Hollander, Tenaha O'Reilly

Effect of interruptions during reading on comprehension and eye movements in children
Chevet Guillaume*, Saoussane Ouahmiden, Thierry Baccino, Annie Vinter, Véronique Drai-Zerbib,

Family factors and critical reading skills: A systematic review
Maria Psyridou, Jenni Ruotsalainen, Mari Manu, Emmi Ulvinen, Jenni Salminen, Leena Paakkari, Irinja Lounassalo, Minna Torppa*

Explanatory visuals instead of text-based multimedia?
Richard Lowe*, Jean-Michel Boucheix

10.15 - 10.45

COFFEE BREAK ☕

10.45 - 11.45

Key-note: Ivar Bråten
From I to AI: Human Sourcing in the Age of AI

11.45 - 12.00

SHORT BREAK 🕐

PARALLEL PAPER SESSION I

12.00 - 13.15

A. Learning with multimedia

Multimedia Effects in Testing: A Meta-Analysis
Lauritz Schewior*, Marlit Annalena Lindner

Cross-modal validation processes occur during processing multimedia materials
Anne Schueler*, Pauline Frick

Multimedia feedback as learning support during inquiry-based learning
Svenja Boegel*, Mathias Ropohl

A Joint Investigation of Multimedia Effects in Learning Material and Test Item Response Options
Emely Hoch*, Salome Flegr, Jochen Kuhn, Jan-Philipp Burde, Katharina Scheiter, Marlit Annalena Lindner

B. Digital and multiple document comprehension

Investigating Digital Reading Literacy among University Students in Hungary
Andrea Magyar*, Anita Habók, Gyöngyvér Molnár

Evaluating and integrating online texts: an integrated intervention for digital literacy skills
Oriana Incognito*, Anna Paola Fallaci, Christian Tarchi

How reading skills support students in their journey through the online information landscape
Carolin Hahnel*, Marcus Schrickel, Philine Drake, Jannik Illmann, Johannes Hartig, Frank Goldhammer, Carmen Köhler

Who benefits motivationally? Feedback and motivation to improve multiple document comprehension
Theresa Zink*, Carolin Hahnel, Ulf Kroehne, Tobias Deribo, Cordula Artelt, Frank Goldhammer, Johannes Naumann, Cornelia Schoor

Thursday, September 5th

13.15 - 14.30	**LUNCH** 🍴

14.30 - 15.30	**Key-note:** Naomi S. Baron *Trusting AI as Author and Editor: Why to Think Twice*

15.30 - 15.45	**SHORT BREAK** 🕐

PARALLEL SYMPOSIA SESSION II

15.45 - 17.15

A. Unravelling intertextual integration: synergies between reading and writing Chair:
Discussant: Ivar Bråten - Chair: Lidia Casado Ledesma

Pre-service teachers' perceptions of multiple text integration
Liron Primor Grunfeld*, Sarit Barzilai

Adjusting strategic reading when integrating multiple texts
Christian Tarchi*, Lidia Casado Ledesma, Øistein Anmarkrud, Elisa Guidi, Marina de Diego Cuéllar

Improving argumentative writing via explicit instruction and peer feedback: an intervention study
Yana Landrieu*, Fien De Smedt, Hilde Van Keer, Bram De Wever

Teaching undergraduates to integrate conflicting views: the effect of an instructive rubric
María Medina Gutiérrez*, Isabel Cuevas, Mar Mateos, Elena Martín

B. The Emotional Design Canvas – The Impact of Visual and Affective Mechanisms to Motivate Learners
Discussant: Cyril Brom - Chair: Juliette Desiron

Aesthetics of illustrations in emotional design: Effects on user experience and multimedia learning
Julien Venni*, Juliette Desiron, Mireille Bétrancourt

Beyond Positive Design - Emotional Design for Aversive Learning Contents
Charlotte Vössing*, Tino Endres, Alexander Renkl

Seductive details and emotional design: How thin is the line?
Juliette Desiron*, Sascha Schneider

Design to Captivate - How Visual Attention Drives the Learning Benefits of Emotional Design
Tino Endres*, Alexander Renkl

17.15 - 17.45	**COFFEE BREAK** ☕

Thursday, September 5th

POSTER SESSION II

17.45 - 18.15

19. Signaling information into storybooks: the effects on preschool children comprehension
Tiphaine Colliot*

20. Evaluation of the effects of instruction presentation format on a procedural task
Faye Myriam*, Nataly Jahchan, Franck Amadieu, Anne Condamines

21. Educational Audio Podcasts in Education: A Rapid Review of Randomized Controlled Studies
Kevin Ackermans, Barbara Defreyne*, Iwan Wopereis

22. Rethinking Design of Static Graphics
Richard Lowe*, Jean-Michel Boucheix

23. Reading comprehension development programme for various types of online texts and graphics
Anita Habók, Andrea Magyar*, Gyöngyvér Molnár

24. Optimizing Educational Videos: Insights from Dual-Phase Study on Cognitive Load & Growth Mindset
Kevin Ackermans*

25. An Eye Tracking Study of Signaling Control in Animations by Learners with Different Prior Knowledge
Killyam Forge*, Julie Lemarié, Pauline Gaillard de Saint Germain, Pierre-Vincent Paubel, Jean-Michel Boucheix

26. Family factors for critical reading
Jenni Ruotsalainen*, Laura Kanniainen, Carita Kiili, Minna Torppa, Leena Paakkari

27. The impact of assisted task instructions on writing from conflicting documents
Raquel Cerdan*, Fátima Rahim, Ignacio Máñez, Jason Braasch

28. Information Literacy Related to Online Financial Fraud: Exploring Online Scam Detection Capabilities
Hayden Mueller*, Nic. Nistor

29. Multimedia in E-Assessments: Can it reduce the adverse effects of test Anxiety?
Sina Lenski*, Nikolai Zinke, Martin Merkt, Hannes Schröter

30. Bilingualism in multimedia learning research: a critical review
Maria Pannatier*

31. Optimizing Digital Reading: Feedback Type & Question Placement Insights from Eye Movements
Mario Romero Palau*, Clara Soberats, Ladislao Salmerón

32. The role of prior beliefs in the interpretation of textual and graphical information
Helge I. Strømsø*, Ivar Bråten, Ymkje Haverkamp, Natalia Latini

33. The effect of generalisations on oral and written text comprehension
Birgit Vogt*

34. Construct validity of a process-oriented test assessing listening component skills
Johannes Naumann, Igor Osipov*

35. Fourth grade reading slump: a present phenomenon
Hugo Sanchez Sanchez*

18.45 - 19.30

EARLI SIG2 Business meeting 💼

20.30

Conference dinner 🥂
(payment required)

Friday, September 6th

8.45 - 10.15

SINGLE SESSION: Advances in text comprehension and graphics II

The FoRe-squares model of teaching with digital media
Alexander Eitel*

In the Greenness not Classroom! The School Physical Environment Affects Students' Text Comprehension
Lucia Mason*, Angelica Ronconi*, Anna Chiara Sorbello, Sara Cotignoli

Improving learning of lines for theatrical role-playing: effect of "hidden text" strategy
Jean-Michel Boucheix*, Justine Oudot, Maggy Lebegue

"I can do both!": On-Device Multitasking Effects on Video Comprehension and Metacomprehension
Angelica Ronconi*, Lucia Mason

How Does a Misinformation Game Work? Effects of Evaluation Strategies and Explanations
Marc Stadtler*, Sarit Barzilai

10.15 - 10.45

COFFEE BREAK ☕

10.45 - 11.45

Key-note: Jennifer Cromley
Leveraging Network Analysis for Insights from Think Aloud and Eye-Tracking Data

11.45 - 12.00

SHORT BREAK 🕐

PARALLEL MIXED SESSION

12.00 - 13.15

A. Navigating the Digital Age: Understanding Metacomprehension in Multiple Documents reading - Symposium

Discussant: Veit Kubik - Chair: Lidia Altamura

Metacomprehension and multitasking while reading multiple documents in secondary school students
Lidia Altamura*, Marc Stadtler, Ladislao Salmerón

I know exactly how I did, didn't I? Monitoring accuracy in multiple document comprehension
Huib Tabbers*, Carolin Hahnel, Daniel Schiffner, Cornelia Schoor

Enhancing metacomprehension via forum post writing and expert post comparison in multi-text reading
Corinna Schuster, Julia Waldeyer, Pia Maiwald, Marc Stadtler*

B. Learning with virtual reality - Paper session

Processing Uncertain Information in Immersive Virtual Reality
Manuela Glaser*, Stephan Schwan

The use of virtual environments to train spatial abilities of primary school children
Sandra Berney*, Sophie Bénard-Linh Quang, Roland Maurer, Mireille Bétrancourt

The relationship between visuo-spatial abilities and spatial representation of virtual environment
Sophie Bénard Linh Quang, Kilian Ciriello*, Sandra Berney*, Roland Maurer and Mireille Bétrancourt

Learning about movements in virtual realities: Role of visuospatial ability and interaction formats
Birgit Brucker*, Georg Pardi, Fabienne Uehlin, Laura Moosmann, Marc Halfmann, Martin Lachmair, Peter Gerjets

Friday, September 6th

13.15 - 14.30

LUNCH 🍴

14.30 - 15.45

PARALLEL PAPER SESSION II

A. Refutation and medium effects

Promoting Meaningful Learning from Texts through Refutational, Visual, and Instructional Strategies
Johannes Kröger*, Sascha Bernholt

Do Refutation (Hyper-)texts Enhance Student Teachers' Conceptual Change?
Veronika Isabel Klara Zoe Nimsch*, Anna-Sophia Dersch, Alexander Eitel

Explainer Video vs. Text: Which Medium is More Effective for Refuting Misconceptions?
Marie-Christin Krebs*, Anna-Sophia Dersch, Hannah Oster, Alexander Eitel

The medium effect with VET students: Do decoding skills matter when reading on paper and screen?
Viktoria Foss*, Hildegunn Støle, Lilla Magyari

B. Reading comprehension in Primary and Secondary school

Reciprocal development of oral and written word recognition through primary school
Johannes Naumann*, Patrick Dahdah, Julia Schindler, Maj-Britt Haffmans, Tobias Richter

Reading Comprehension Assessment in Monolingual and Multilingual Students of Secondary Education
Christel Van Vreckem*, Annemie Desoete, Sofie Carnewal

The impact of an oral language intervention on reading comprehension and written composition
Dacian Dolean*, Monica Melby-Lervåg, Arne Lervåg

Text comprehension as a product of multiple factors: advances from traditional models in reading
Laura Hernandez Sobrino*, Virginia González Santamaría, Eva Gutierrez-Sigut

15.45 - 16.00

SHORT BREAK 🕐

16.00 - 17.15

PARALLEL PAPER SESSION III

A. Source evaluation

Storifying Instructional Videos to Promote Credibility Evaluation: Examining Engagement and Learning
Riikka Anttonen*, Kristian Kiili, Eija Räikkönen, Carita Kiili

Video-Based Instruction Promoting Sixth Graders' Online Credibility Evaluation
Carita Kiili*, Julie Coiro, Kristian Kiili, Eija Räikkönen

School students rely on their own opinion rather than the source expertise when evaluating videos
Brivaël Hémon, Bastien Trémolière, Amaël Arguel, Franck Amadieu, Kévin De Checchi*

Openness and epistemic justifications predict tendency to favor videos featuring experts
Brivael Hémon*, Kévin De Checchi, Amaël Arguel, Bastien Trémolière, Franck Amadieu

→

Friday, September 6th

16.00 - 17.15	**→ PARALLEL PAPER SESSION III**

B. Multimedia and seductive details

Static Versus Dynamic Representational and Decorative Pictures in Word Problems: Less Might be More
Marlit Annalena Lindner*, Tom Ehrhart, Simon Grund, Tim Höffler

Laughing Their Heads off: When Teacher Humor Acts as a Seductive Detail
Lisa Bender, Alexander Renkl, Tino Endres*

Do inhibition abilities influence the effects of animations combined with seductive details?
Tiphaine Colliot*, Jean-Michel Boucheix

Does need for cognition moderate the effect of stepwise fade-in in videos with narrated slides?
Christina Sondermann*, Ronja Spieckermann, Hannes Schröter, Martin Merkt

Comic-based Storytelling in STEM Instruction Isn't Superior to Classical Worksheets
Marc Rodemer*, Nils Ullenboom

17.15 - 17.45	**COFFEE BREAK** ☕

17.45 - 18.15	**CLOSING CEREMONY & JURE AWARDS** 🏆

✦ ✦ ✦

Abstracts

KEYNOTES

Eye see how you are reading: Reading comprehension behavior in typical and atypical readers across multimedia contexts
Wednesday, September 4th, 14.30-15.30h

Carolien A.N. Knoop-van Campen (JURE Keynote)

Reading comprehension is declining and conventional interventions are not sufficiently closing this gap. Understanding children's reading behavior during reading may provide insight into how we can optimize reading comprehension education. This is especially relevant for children with reading difficulties, like children with dyslexia. Eye tracking holds great potential to identify children's reading behavior and regulation during reading, with the opportunity to map visual attention and reading patterns. In this keynote, Carolien explains her research on reading comprehension behavior. She addresses reading strategies, discusses how we use eye-tracking via webcams to distinguish reading patterns, and talks about the connection between reading behavior and reading comprehension scores in typical and atypical students. Specifically, Carolien discusses how audio support for readers with dyslexia (children, adolescents, and adults) affects their reading comprehension behavior and learning outcomes.

From I to AI: Human Sourcing in the Age of AI
Thursday, September 5th, 10.45-11.45h

Ivar Bråten

In this presentation, I will discuss the construct of sourcing and the role of some individual and contextual factors in sourcing. I will also raise a number of issues regarding specific challenges that Internet technologies and artificial intelligence built on large language models may pose for human sourcing. A selection of recent intervention studies to improve students' sourcing and their effects on both reading and writing outcomes will also be briefly discussed.

Abstracts

KEYNOTES

Trusting AI as Author and Editor: Why to Think Twice
Thursday, September 5th, 14.30-15.30h

Naomi S. Baron

In late 2022, computer users became infatuated with ChatGPT, Open AI's new artificial intelligence writing tool. Harnessing computers to compose and to edit written text has a much longer backstory. But it was ChatGPT that focused educators' attention on the powers and perils of AI for learning. One "peril" is the degree to which students – and the rest of us – should be trusting the writing that AI generates or edits for us. This talk will focus on four aspects of such trust: accuracy, deskilling, personal voice, and cognitive consequences. In the process, we will connect the dots between generative AI and reading in print versus on screens, as well as between the haptics of handwriting (a concept alien to AI) and print versus screen issues. An obvious crucial next step should be exploring the implications for both education and educational research.

Leveraging Network Analysis for Insights from Think Aloud and Eye Tracking Data
Friday, September 6th, 10.45-11.45h

Jennifer Cromley

Many education researchers are familiar with social network analysis of children in classrooms, teachers in school districts, and so on. The same network analysis techniques can be applied to individuals' knowledge structures (e.g., from think-aloud protocols or written responses), eye tracking scanpaths, navigation captured in logfiles, and other during-learning process data. I report on the added value of these network metrics with one think-aloud and one think-aloud-and-eye-tracking dataset, beyond the strategy use or count of gazes in AOIs that are typically used to predict learning outcomes. Considerations for analyzing different types of knowledge/attitudes (e.g., individuals verbalizing both positive and negative attitudes) we be discussed, as well as options for analyzing multiple data streams. Similarities and differences will be discussed in the context of small published literatures applying network analysis to either individual knowledge structures or scanpath/navigation data. Free resources for learning these techniques will be shared.

Abstracts

Wednesday, September 4th, 15.45-17.15h
PARALLEL SYMPOSIA SESSION I

A. Evaluating Online Resources: Cognitive Foundations and Educational Interventions

Discussant: Carita Kiili - Chair: Nicolae Nistor

The ubiquitous misinformation in online environments calls for interventions fostering information literacy. This symposium gives an overview over cognitive foundations and an insight in educational interventions. We present a systematic literature review and an interview study on online information evaluation, complemented by two intervention studies of training information evaluation strategies focused on source evaluation and information analysis.

Expanding the CORE Framework: A Systematic Review Across Discipline and Age Group
Elena Forzani, Julie Corrigan*

This study reports on a systematic review of online information evaluation. The authors drew on the critical online resource evaluation (CORE) framework to identify and evaluate 20% (n = 913) of 4,516 articles marked for inclusion (of 10,321 initially identified). Findings suggest two distinct ways for conceptualizing online evaluation as well as important differences across discipline and age.

Cognitive Scripts Towards Information (Il) Literacy: An Interview Study
Nicolae Nistor*, Dilara Isik, Nora Krasniqi

In search of more efficient interventions countering misinformation and from a cognitive perspective, we interviewed N = 51 online information consumers asking how they cognitively process information and assessing their information evaluation performance. Based on persuasion knowledge, analytic processing was more accurate than intuitive processing when evaluating information. Conclusions contribute to the development of improved educational interventions fostering information literacy.

Effects of Lateral Reading and Analytical Reading on students' evaluation of information reliability
Fethi Boutelaa, Gastón Saux, Mônica Macedo-Rouet*

A sample of N = 125 engineering students were randomly assigned to a control baseline or to receive training on source-based evaluations of multiple documents, either with an Analytic or a Lateral Reading approach. The post-pretest gain indicated that Lateral Reading led to better reliability judgements, whereas Analytical Reading led to better justifications for such judgments.

Abstracts

A. Evaluating Online Resources: Cognitive Foundations and Educational Interventions

Discussant: Carita Kiili - Chair: Nicolae Nistor

Cultivating sourcing and corroboration skills in a teacher-led program for lower secondary students
Philipp Marten, Sandra Assmann, Marc Stadtler*

This study investigates training lower secondary students in online information evaluation using sourcing and corroboration. It compares short and midterm effects of a four-lesson, teacher-led strategy training with a knowledge training on students' meta-strategic knowledge, credibility discernment, and debunking skills. Data from 21 seventh and eighth grade classrooms are currently being collected. Results will inform educational interventions against online misinformation.

B. Comprehension in atypical readers: the cases of deafness and autism (Invited symposium EARLI SIG15)

Discussant: Eliane Segers - Chair: David Saldaña

Deaf-or-hard-of-hearing and autistic readers often present difficulties in decoding or reading comprehension. The symposium explores whether predictors of successful reading relate to decoding and comprehension the same way in these groups as in typically developing individuals. The four papers in this symposium explore phonological processing, non-phonological processes, executive functions, and task features across three languages (Italian, Spanish, and English).

Factors underpinning deaf-and-hard-of-hearing children's poor reading comprehension
Barbara Arfé*, Gaia Spicciarelli, Marco Gubernale, Rosamaria Santarelli, Pietro Scimemi, Elisabetta Genovese, Edoardo Arslan

Much research exploring the causes of the reading comprehension problems of deaf-and-hard-of-hearing (DHH) children has been conducted in English, a deep and outlier orthography. In this talk, the conclusions drawn from this research will be further tested through two studies that examine the phonological and non-phonological factors contributing to reading comprehension impairment in DHH children in a shallow orthography—Italian.

Wednesday, September 4th, 15.45-17.15h
PARALLEL SYMPOSIA SESSION I

B. Comprehension in atypical readers: the cases of deafness and autism (Invited symposium EARLI SIG15)

Discussant: Eliane Segers - Chair: David Saldaña

Hearing but not deaf adults pre-activate phonological features of words during reading comprehension

Eva Gutierrez-Sigut,* Katherine Rowley, Ixone Saenz-Paraiso, Marta Vergara Martinez, Manuel Perea, Mairéad MacSweeney

The research presented in this talk will focus on whether deaf adults pre-activate semantic and phonological information during reading comprehension. We measured reading times of deaf and hearing adults during a self-paced moving window reading task. Results showed that while all readers pre-activated semantic features, only hearing readers pre-activated phonological features of words when the task required reading for comprehension.

Idiom processing advantage in students with autism spectrum disorder: An eye-movement research

Nadina Gómez-Merino, Antonio Ferrer, Ana García-Blanco, Alejandro Téllez, Inmaculada Fajardo*

Students with autism were asked to comprehend sentences with idioms presented in oral/written format and preceded by figurative/literal contexts. Accuracy did not differ but participants showed significantly longer first pass, total and regression path times in the idiom area in the figurative than in the literal condition. Decision time was shorter in the written than in the oral condition.

Strategic reading behaviour and executive function in readers with autism

David Saldaña*, Pablo Delgado, Gema Erena-Guardia, Miriam Rivero-Contreras, Nuria Calet, Gracia Jiménez-Fernández, Francisco Javier Moreno-Pérez, Isabel R. Rodríguez-Ortiz

This study focuses on strategic reading behaviour and reading comprehension in autism. Typically developing and autistic adolescent readers participated in two eye-tracking experiments: they read texts with different kinds of instructions and were presented with texts with and without supporting headings. Although readers with autism did not adjust differently to task aims, they made less strategic use of headings.

Abstracts

1. The role of tasks in the comprehension of multiple texts: a scoping review
Mariola Giménez-Salvador*, Raquel Cerdan

The goal of this scoping review has been to examine the tasks used to promote and measure the processing of multiple documents, both complementary and conflicting. Findings reveal that instructions encouraging across-text connections are beneficial for complementary documents, whereas requests to complete an argumentative task show an advantage for contradictory texts. Future experimental studies might contrast this pattern of results.

2. Multimedia lesson on computer viruses: Examining three design principles among 8-year-olds
Cyril Brom*, Tereza Hannemann, Filip Děchtěrenko

We tested three design principles – segmenting, temporal contiguity, and signaling – among 8-year-olds (N = 392, quasi-experiment, three groups). These principles were examined together in a 30-min-long lesson on computer viruses in school. Compared to a lesson without the principles, the principles improved learning both when used around 10-min-long videos embedded in the lesson, as well as without the videos.

3. Concept Learning with Pictures and Concept Maps: Language Background and Affective Effects
Yen Na Yum, Phillip Holcomb, Katherine Midgley, Neil Cohn, Jie Wang, Hei Yuen Dawn Lau*

This study examines he between-group language effects in English, Dutch, and Chinese university students (target N = 200 each), the within-participant presentation mode effects (± picture and ± concept map), and the mediation effects of situational interest and perceived cognitive load on concept learning in English. Meaning recognition and generation is measured immediately after learning and after one week.

4. Descriptive and depictive representations for learning the lead role in partnered dances
Erica de Vries*

This theoretical poster presents descriptive and depictive representations for learning to lead in partnered dances. We present two representational systems and define dance positions in order to systematically model dance moves. In a representational analysis, we will compare them on the functions of multiple external representations, the intrinsic/extrinsic nature of representational systems, and the distributedness of the problem space.

Abstracts

5. Visual strategies when working with circuit diagrams
Stefanie Peter*, Olaf Krey

When learning physical concepts of electricity, learners show difficulties related to the representation of electric circuits – circuit diagrams. They have problems identifying series and parallel circuits and translating between circuit diagrams and real circuits. In an eye-tracking study we want to investigate the strategies that learners employ when dealing with circuit diagrams and how they relate to prior knowledge.

6. Effect of congruent musical background on multimedia learning: a seductive detail effect ?
Laure Léger*, Emmanuel Schneider

The aim of this study is to investigate whether musical background that is related to the topic of the text could be considered as a seductive detail and change multimedia learning. An experimental study was conducted to test this hypothesis. The results were presented at the conference.

7. Can we foster evaluation of reliable from false information using worked examples?
Nina Udvardi-Lakos*, Lisa Bender, Tino Endres, Alexander Renkl

The skill to discern true information from fake news could be fostered using worked examples, showing skill application in an exemplifying domain. A (too) interesting exemplifying domain could distract learners from skill learning, although they may have to apply their skill to such topics in real life. We test whether relevance instructions help learners acquire the skill without distraction effects.

8. Comprehension of text and graphics in the 21st century: Development of a data literacy test
Cornelia Schoor*, Kathrin Lockl, Jutta von Maurice, Ilka Wolter, Cordula Artelt

Our aim was to develop a framework and a standardized test for measuring data literacy in the general population. The framework is based on the data life cycle. A pilot study involved 208 participants and 157 items. Results showed an average score of 81.8%. After excluding several inappropriate items, the test showed good reliability and coverage of the framework.

Abstracts

9. Teachers' perception of quality in novice writers' texts: an eye-tracking study
Jana Gürtler*

This preliminary study investigates how eye-tracking data shows teachers' perception of different measures of text quality in novice writers' texts. As a part of teacher professional knowledge, teacher beliefs directly influence their situation-specific skills, such as perception, when diagnosing student texts. The data obtained on the perception process is used to draw conclusions about teachers' beliefs regarding writing.

10. Using graphics to support the comprehension of a text with conflicting information on climate change
María García Serrano*, Rubén Delgado Álvarez , J. Ricardo García Pérez, Javier Rosales

The present study tries to explore the impact of graphics to the comprehension of the texts when the information presented refutes misinformation on the climate change. It is also explored how interest in the topic, prior knowledge, epistemic perspective, and reading comprehension skills impact on the comprehension of each type of information provided (misinformation vs. scientific information) and its endorsement.

11. LAMMP: A layered model to investigate multimedia assessment items
Andrienne Kerckhoffs*, José Janssen, Ron Pat-El, Halszka Maria Jarodzka

Responding to the need for multimedia assessment design guidelines, we developed a four-layered examination model, LAMMP: Learning and assessment context, Assessment item, MultiMedia, and Pictorial representation. It identifies and defines key factors that, depending on their design, function, and mutual relationship, potentially support or hamper the (cognitive) process of resolving a multimedia item. Thus aiming to facilitate multimedia assessment research.

12. Delaying elaborated feedback: The role of summative and question-based feedback
Carmen Candel*, Ignacio Máñez, Raquel Cerdan, Eduardo Vidal-Abarca

Elaborative feedback (EF) seems to benefit learning. However, how timing, prior knowledge, and level of integration of the feedback message influences performance and learning is still a pending question. This study examines the extent to which two types of elaborative delayed-EF (question-based vs summative) benefits students' question-answering performance and final learning over immediate-EF.

Abstracts

13. Ratings of emotion by children aged 9 to 13 during text reading: a developmental study
Sabine Fevin*, Elise Tornare, Christine Ros, Nicolas Vibert

This research aimed at understanding how children from 3rd to 7th grades self-rated the emotions they feel when reading short texts with positive or negative emotional valence, using the Self-Assessment-Manikin. The type of prior instructions given to children was also manipulated to check whether the addition of rating examples (for negative, neutral and positive sentences) influenced their assessment of emotions.

14. Using Eye-Tracking to Detect the Comprehensibility of Questionnaire Items
Nada Zahra Pohl*, Heiko Schmidt, Dagmar Kern, Steffen Gottschling, Yvonne Kammerer

Eye-tracking, self-report, and reading-skill data will be collected for N=50 participants presented with a set of negated (less comprehensible) and affirmative (more comprehensible) questionnaire items, in order to analyse respondents' comprehension difficulties. Using the collected data, supervised machine learning models will be developed to predict comprehension problems in items based on text-related and reader-related factors derived from previous literature.

15. Predetermination of Visual Representation Type Influences Students' Performance and Cognitive Load
Katrin Schuessler*, Michael Giese, Maik Walpuski

Translating verbal information into visual representations is fundamental to communicating in the field of organic chemistry. Many introductory tasks aim to develop and assess this skill among organic chemistry students. This study investigates the difficulties students have when digital tasks predetermine a specific representation type and limit students' options to work within representations (e.g. add derived or implicit information).

16. The effects of timing and elaborateness of feedback on 5th grade students' learning from text
Elise Swart*, Ignacio Máñez, Daniel Garcia-Costa

Previous research has shown that feedback supports reading comprehension, but that its effectiveness varies as a function of timing and elaborateness of the feedback. Whereas previous research mainly focused on higher education, the aim of the present study is to investigate the combined effect of timing and elaborateness of feedback in a group of 5th grade elementary school students.

Abstracts

17. Comparing Concept Map, Summary, Animations, Pictures & Prior Knowledge in Hypertext Comprehension

Christine Fabre, Franck Amadieu, Lucie Bouvet*

This study on hypertext comprehension examined the effects of the type of overview (concept map, textual summary) and content dynamic format (animation, static images). The concept map supported higher comprehension of explicit information and longer processing of pages than the summary for the lower prior knowledge readers but only for the condition with animation in pages.

18. Beyond Implicit Theories of Intelligence: Enhancing Learning from Errors in Multimedia Education

Mariyem Ahmida, Laure Léger*

Students with entity beliefs about their intelligence pay less attention to corrective feedback after making errors and display more negative emotions than incremental believers. Our study investigates whether a brief introduction on the functionality of errors and having more control over feedback display help these students react less negatively and pay more attention to feedback to improve their performances.

- -

Exploring students' trust in generative AI: Impact of verbal anthropomorphism & contextual relevance

Juliane Richter*, Olivia Abt, Natascha Clauser, Hannah Patzelt

The popularity of genAI (e.g., ChatGPT) among students emphasizes the need to balance reliance on its generated results. Investigating the impact of machine-like versus human-like responses on trust and genAI usage intention, our findings suggest that students trust machine-like responses more related to prompts significant for study results compared to prompts with low relevance, potentially due to the machine heuristic.

Abstracts

Thursday, September 5th, 8.45-10.15h
SINGLE SESSION: Advances in text comprehension and graphics I

Using scenario-based assessment in post-secondary education
John Sabatini*, Daniel Feller, John Hollander, Tenaha O'Reilly

We present work-in-progress that explores baseline literacy skills in incoming undergraduates and development efforts that aim to build technology-enhanced, actionable assessment results that inform effective instruction using scenario-based assessments (SBA) and other forms of multimodal performance literacy assessments. We will discuss baseline results and plans for how to contextualize assessments in practical applications, utilizing gen-AI to support instructors and students.

Effect of interruptions during reading on comprehension and eye movements in children
Chevet Guillaume*, Saoussane Ouahmiden, Thierry Baccino, Annie Vinter, Véronique Drai-Zerbib,

Our study evaluated the impact of interruptions during reading, comparing novice readers, who are still developing their reading skills (2nd grade), and more advanced skilled readers (5th grade). 51 pupils read in interrupted or uninterrupted condition while their eye movements were recorded. Interruptions didn't impact the comprehension. However, interruptions resulted in more re-reading behavior in particular for 2nd grade pupils.

Family factors and critical reading skills: A systematic review
Maria Psyridou, Jenni Ruotsalainen, Mari Manu, Emmi Ulvinen, Jenni Salminen, Leena Paakkari, Irinja Lounassalo, Minna Torppa*

This is a systematic review of literature regarding the associations between critical reading skills and family factors. The most often examined and the closely associated family factors were identified. The review also revealed a need for improvement in the descriptions of the reading measures and lack of replications due to methodological differences in this research area.

Explanatory visuals instead of text-based multimedia?
Richard Lowe*, Jean-Michel Boucheix

Appropriately designed visualizations are representationally closer to the posited characteristics of mental models of technical systems, than is corresponding explanatory text. Learning caulking gun functioning from of a set of ancillary diagrams accompanied by a picture and a conventional text plus picture multimedia combination, informationally equivalent, were compared. Results showed ancillary diagrams were slightly more effective in supporting comprehension.

Thursday, September 5th, 12.00-13.15h
PARALLEL PAPER SESSION I

A. Learning with multimedia

Multimedia Effects in Testing: A Meta-Analysis
Lauritz Schewior*, Marlit Annalena Lindner

This meta-analysis, based on 119 effect sizes (40 studies), examined multimedia effects of different picture types on educational outcomes in testing. Decorative pictures showed no significant effects. Representational pictures improved response correctness, metacognition and satisfaction but did not affect time on task. Informative pictures' effects were highly heterogeneous. Further research is needed focusing on moderating factors beyond the picture function.

Cross-modal validation processes occur during processing multimedia materials
Anne Schueler*, Pauline Frick

During reading, automatic validation processes occur that check the validity of integrated text information. In four experiments, we were able to show that automatic cross-modal validation processes also apply to the processing of multimedia materials. The validation processes were observed when pictures were combined with single sentences or longer text as well as with simultaneous and sequential text-picture presentation.

Multimedia feedback as learning support during inquiry-based learning
Svenja Boegel*, Mathias Ropohl

Multimedia feedback can be utilised to support students in planning experiments during inquiry-based learning, providing relevant information through texts and images. This feedback aims to support cognitive processes by keeping the cognitive load low and is suitable for building subject-specific competences regarding planning experiments. These findings are in line with general text and image comprehension theories (e.g. CTML, IMTPC).

A Joint Investigation of Multimedia Effects in Learning Material and Test Item Response Options
Emely Hoch*, Salome Flegr, Jochen Kuhn, Jan-Philipp Burde, Katharina Scheiter, Marlit Annalena Lindner

In this experiment, we jointly investigate multimedia effects in learning material (text-only vs. text+picture) and test item response options (text-only vs. picture-only vs. text+picture). We found evidence of beneficial multimedia design in both learning and testing on student performance. The manipulations in learning and testing material did not significantly interact and indicated a pattern of summative multimedia effects.

Thursday, September 5th, 12.00-13.15h
PARALLEL PAPER SESSION I

B. Digital and multiple document comprehension

Investigating Digital Reading Literacy among University Students in Hungary

Andrea Magyar*, Anita Habók, Gyöngyvér Molnár

The paper aimed to explore how effectively university students can employ their general and online problem-solving strategies to comprehend various online text formats. The text formats included continuous and non-continuous texts. Students achieved significantly higher in the diagram- and graph-based tasks than in the continuous text tasks, confirming that visual expression of information facilitates text processing in the digital environment.

Evaluating and integrating online texts: an integrated intervention for digital literacy skills

Oriana Incognito*, Anna Paola Fallaci, Christian Tarchi

We tested the efficacy of an intervention (VITO) on sourcing and intertextual integration while reading multiple texts on 87 7th-8th-grade students. The students who participated in VITO were engaged in three sessions on sourcing and intertextual integration at different stages of the reading-writing process. The experimental group students outperformed control group students in intertextual integration and sourcing.

How reading skills support students in their journey through the online information landscape

Carolin Hahnel*, Marcus Schrickel, Philine Drake, Jannik Illmann, Johannes Hartig, Frank Goldhammer, Carmen Köhler

The study aims to understand the relationship between reading skills and the performance of first-semester bachelor students in searching, evaluating, and reasoning from online information. Apart from participation in a reading test, we asked students to solve different information problems with the Internet and recorded their search behavior, written responses, and encountered websites that provided the database for our analyses.

Who benefits motivationally? Feedback and motivation to improve multiple document comprehension

Theresa Zink*, Carolin Hahnel, Ulf Kroehne, Tobias Deribo, Cordula Artelt, Frank Goldhammer, Johannes Naumann, Cornelia Schoor

In our study, we investigated the relationship between the direction of performance feedback, feedback perception, and the motivation to improve in multiple document comprehension (MDC). 202 university students participated in an MDC assessment with individual feedback. Results indicated that students who received positive performance feedback and those who perceived the feedback as useful benefitted motivationally.

Abstracts

A. Unravelling intertextual integration: synergies between reading and writing

Chair: Discussant: Ivar Bråten - Chair: Lidia Casado Ledesma

The symposium addresses the challenges of intertextual integration, encompassing four studies: 1) pre-service teachers' perceptions of intertextual integration, 2) undergraduate students' integration strategies in multiple-text reading tasks, and 3-4) the effectiveness of interventions in integrating information into argumentative texts. These studies shed light on intertextual integration across educational levels and evaluate instructional methods crucial for academic success.

Pre-service teachers' perceptions of multiple text integration
Liron Primor Grunfeld*, Sarit Barzilai

This study examined pre-service teachers' perceptions of the epistemic aims and evaluation criteria of intertextual integration. Teachers most frequently mentioned the aims of establishing reliability and gaining knowledge. The most frequent criteria were structure, coherence, and relevance. Associations were identified between teachers' aims and criteria. Similarities and differences to in-service teachers' aims and criteria are discussed.

Adjusting strategic reading when integrating multiple texts
Christian Tarchi*, Lidia Casado Ledesma, Øistein Anmarkrud, Elisa Guidi, Marina de Diego Cuéllar

The study examines variations in intertextual integration strategies and argument coverage among university students when reading multiple texts with different levels of source reliability. The manipulation of source reliability was not associated with intertextual integration strategies. The manipulation had a statistically significant effect on coverage of arguments across texts in students with moderate prior beliefs.

Improving argumentative writing via explicit instruction and peer feedback: an intervention study
Yana Landrieu*, Fien De Smedt, Hilde Van Keer, Bram De Wever

Writing argumentative texts based on informative source texts often poses challenges for secondary school students. To enhance argumentative writing skills, an intervention study focusing on explicit writing instruction and peer feedback by means of either rubrics or dialogic talk), was set up. Multilevel results of the intervention study will be discussed during the conference.

Abstracts

A. Unravelling intertextual integration: synergies between reading and writing

Chair: Discussant: Ivar Bråten - Chair: Lidia Casado Ledesma

Teaching undergraduates to integrate conflicting views: the effect of an instructive rubric

María Medina Gutiérrez*, Isabel Cuevas, Mar Mateos, Elena Martín

Integrating sources to elaborate argumentative syntheses is a priority competence at university, in which students have difficulties. This study shows the effectiveness of an instructive rubric to improve the integration strategies used in argumentative syntheses, and to reach a conclusion by establishing conciliatory solutions. In this symposium we will discuss why this rubric overcomes some limitations of other instructional components.

B. The Emotional Design Canvas – The Impact of Visual and Affective Mechanisms to Motivate Learners

Discussant: Cyril Brom - Chair: Juliette Desiron

This symposium investigates how emotional design influences learners' motivation and learning. Through four studies, we examine shared design criteria, that enable conclusions across varied learning environments. This approach ensures a holistic understanding of the mechanisms involved in emotional design. Our objective is to better understand these mechanisms to guide key instructional design decisions, leading to engaging learning materials.

Aesthetics of illustrations in emotional design: Effects on user experience and multimedia learning

Julien Venni*, Juliette Desiron, Mireille Bétrancourt

This study investigates the effect of emotional design on multimedia learning, using two versions of an online instructional material differing in the aesthetic value of graphics. Results showed that higher aesthetics improved user experience and situational interest but did not affect learning outcomes. Eyetracking data suggest that aesthetic design influences visual attention, especially the gaze-capturing effects of anthropomorphism.

Abstracts

B. The Emotional Design Canvas – The Impact of Visual and Affective Mechanisms to Motivate Learners

Discussant: Cyril Brom - Chair: Juliette Desiron

Beyond Positive Design - Emotional Design for Aversive Learning Contents
Charlotte Vössing*, Tino Endres, Alexander Renkl

Emotional Design is considered to foster learning by providing positive, warm, and friendly elements. However, according to interest theories, emotional design might also work with aversive emotional design. In this study, we extend the exploration of Emotional Design beyond its traditionally positive framework by examining whether its effectiveness is contingent upon positive affect or can operate independently of affective valence.

Seductive details and emotional design: How thin is the line?
Juliette Desiron*, Sascha Schneider

In recent years, a growing body of research has started to investigate the role of motivation and affect when learning from multimedia documents through the scope of emotional design. Although results are promising, particularly when considering learners' situational interest, the distinction between emotional design elements and seductive details and their effect on learning remains unclear.

Design to Captivate - How Visual Attention Drives the Learning Benefits of Emotional Design
Tino Endres*, Alexander Renkl

Emotional design was found to enhance sustained learning through prompting prolonged attention, particularly beneficial in distracting learning settings. In this study we compared the impact of emotional-design and neutral-design videos (between-subjects) on initial and sustained learning (within-subjects) in a learning environment designed to be distracting. Emotional-design videos evoked reduced visual distraction, measured via webcam-based eye tracking, which enhanced sustained learning.

Abstracts

Thursday, September 5th, 17.45-18.15h
POSTER SESSION II

19. Signaling information into storybooks: the effects on preschool children comprehension
Tiphaine Colliot*

The purpose of the present study was to investigate the effects of the presence of illustrations combined with the effects of signals on preschool children's memorization and comprehension of a storybook. More specifically, we aimed to assess how signaling information into illustrations influence children's comprehension. Results showed a positive effect of illustrations and a positive effect of signals on learning.

20. Evaluation of the effects of instruction presentation format on a procedural task
Faye Myriam*, Nataly Jahchan, Franck Amadieu, Anne Condamines

This research examined multimedia, animation and multimodality effects of procedural instruction on the immediate execution of a motor task. Five conditions are compared: image-only, image with text, video-only, video with text and video with narration. Online processing by the use of eye tracking method and quality of task execution will be analyzed.

21. Educational Audio Podcasts in Education: A Rapid Review of Randomized Controlled Studies
Kevin Ackermans, Barbara Defreyne*, Iwan Wopereis

This review, building on Hew's 2009 research, examines the influence of podcast types and learning objectives on performance by analyzing eight studies from seven databases, uncovering four themes that suggest well-designed educational podcasts can significantly improve learning outcomes and cater to diverse cognitive skills.

22. Rethinking Design of Static Graphics
Richard Lowe*, Jean-Michel Boucheix

This theoretical paper explores the Animation Processing Model's applicability to designing static diagrams of dynamic content. It proposes that APM-based designs should better match human information processing characteristics than traditional designs resulting in superior mental models. Recent empirical results indicate APM-like processes do indeed occur during study of static diagrams. Implications for advancing theory and improving design practice are considered.

Abstracts

23. Reading comprehension development programme for various types of online texts and graphics

Anita Habók, Andrea Magyar*, Gyöngyvér Molnár

Our research focused on two main objectives. Firstly, we aimed to design a reading comprehension development program tailored for 11-14 year olds, suitable for implementation in an online classroom setting. Secondly, we sought to investigate the efficacy of various task types within the program, specifically examining their functionality in the context of individual work within a classroom.

24. Optimizing Educational Videos: Insights from Dual-Phase Study on Cognitive Load & Growth Mindset

Kevin Ackermans*

This study explores how question placement (end vs. within text) and feedback type (none, simple, elaborated) influence eye movement in 20 high school students during digital reading. Using mixed-effects models, the aim is to provide insights for optimizing digital reading settings to enhance attention on screens.

25. An Eye Tracking Study of Signaling Control in Animations by Learners with Different Prior Knowledge

Killyam Forge*, Julie Lemarié, Pauline Gaillard de Saint Germain, Pierre-Vincent Paubel, Jean-Michel Boucheix

The inconsistent results in the literature on the signaling effect in learning from educational animations makes necessary a better understanding of the moderators that influence signaling effectiveness, particularly the effect of prior knowledge. This eye-tracking study aimed to investigate the joint effects of prior knowledge and signaling control on learning performance and cognitive load of learners studying from an animation.

26. Family factors for critical reading

Jenni Ruotsalainen*, Laura Kanniainen, Carita Kiili, Minna Torppa, Leena Paakkari

Factor structure of a questionnaire on family factors for critical reading and their associations with background factors were examined among parents of students in grades 4, 6, and 8. The factor structure was different in each of the age-groups. Associations between amount of reading materials and parental education and family factors for critical reading were found.

Abstracts

Thursday, September 5th, 17.45-18.15h
POSTER SESSION II

27. The impact of assisted task instructions on writing from conflicting documents
Raquel Cerdan*, Fátima Rahim, Ignacio Máñez, Jason Braasch

We studied the impact of different types of instructions (academic vs. assisted) on the integration of arguments. Academic instructions included a prompt to read four conflicting texts and write an integrated synthesis. Assisted instructions also included a model showing a balanced inclusion of ideas and sources. Participants in the assisted condition included a higher number of literal ideas and sources.

28. Information Literacy Related to Online Financial Fraud: Exploring Online Scam Detection Capabilities
Hayden Mueller*, Nic. Nistor

In this mixed-methods think-aloud expert-novice study, we compare the accuracy and decision-making processes of IT professionals, business undergraduates, and other undergraduates while assessing the trustworthiness of listings from Facebook Marketplace. Though we found no difference between groups' abilities to detect fraud, we identified strategies used by the most successful participants that could be useful in future educational interventions.

29. Multimedia in E-Assessments: Can it reduce the adverse effects of test Anxiety?
Sina Lenski*, Nikolai Zinke, Martin Merkt, Hannes Schröter

This research explored the effects of multimedia quizzes on emotions, performance, and their potential to reduce negative effects of test anxiety in two experiments. Multimedia depicting irrelevant information reduced negative emotions for anxious individuals while multimedia quizzes weakened the negative effect of test anxiety on pleasantness. For both designs, no direct effects on emotions and performance were found.

30. Bilingualism in multimedia learning research: a critical review
Maria Pannatier*

As the 'bilingual advantage debate' continues, this paper addresses the issue of bilingualism as a learner-related variable in multimedia learning research. Starting from the definition of a bilingual person, it examines the previous evidence to date for the effects of bilingualism, its measures and types, the methods used, and argues for more research into the factors that moderate its manifestation.

Abstracts

31. Optimizing Digital Reading: Feedback Type & Question Placement Insights from Eye Movements
Mario Romero Palau*, Clara Soberats, Ladislao Salmerón

This study explores how question placement (end vs. within text) and feedback type (none, simple, elaborated) influence eye movement in 20 high school students during digital reading. Using mixed-effects models, the aim is to provide insights for optimizing digital reading settings to enhance attention on screens.

32. The role of prior beliefs in the interpretation of textual and graphical information
Helge I. Strømsø*, Ivar Bråten, Ymkje Haverkamp, Natalia Latini

We investigated whether students' prior beliefs affect their comprehension of a text including two graphs, with one of them being ambiguous. Specifically, we are interested in the role of students' prior beliefs in their interpretation of both the text and the ambiguous graph when they experience inconsistency between beliefs and text content, and inconsistency between text and graph.

33. The effect of generalisations on oral and written text comprehension
Birgit Vogt*

Generalisation as a key skill in language acquisition (Feilke, 2012; Kintsch, 1998; Shepard, 1997; Vygotsky, 1964) has received little attention in educational research on text comprehension. By investigating factors that influence generalisation, overlaps with text comprehension can be inferred. The research question, hypotheses, study design for empirical validation and expected results are presented in this poster.

34. Construct validity of a process-oriented test assessing listening component skills
Johannes Naumann, Igor Osipov*

In the present study, data collected from 194 and 238 German primary school children were used to investigate the construct validity of ProDi-H, a recently developed process-oriented test of listening component skills. The study revealed weak correlations of listening component skills with reading fluency and strong correlations with text-level listening comprehension suggesting evidence in favor of construct validity of ProDi-H.

35. Fourth grade reading slump: a present phenomenon
Hugo Sanchez Sanchez*

The decline in the fourth grade indicates a crisis period between learning to read and reading to learn. This study used an institutional database of the Secretary of Education of Bogotá of Colombia where students' scores are reported. The results show a drop in scores in the fourth grade that continues into later grades.

Abstracts

The FoRe-squares model of teaching with digital media
Alexander Eitel*

The FoRe-squares model predicts (in-)effective teaching with digital media based on two basic factors "Focus support" and "Reinforcement". Teaching with digital media is effective when students are (1) enabled to engage in goal-driven processing due to focus support (e.g. multimedia principles), and (2) willing to engage because they expect or feel reinforced for goal-driven processing.

In the Greenness not Classroom! The School Physical Environment Affects Students' Text Comprehension
Lucia Mason*, Angelica Ronconi*, Anna Chiara Sorbello, Sara Cotignoli

The role of the school physical environment in learning tasks is unexplored. Two within-subjects studies investigated the effects of indoor (classroom) and outdoor (green garden) environments in third and fourth graders' text comprehension. Based on the attention restoration theory, the studies showed that students had higher scores in the green than classroom environment, especially those with higher emotional/behavioral difficulties.

Improving learning of lines for theatrical role-playing: effect of "hidden text" strategy
Jean-Michel Boucheix*, Justine Oudot, Maggy Lebegue

Learning lines from long texts is a major challenge for actors. The effectiveness of a novel learning method in the memorization of texts from a play, based on a combination of embodied acting and testing practice, called hidden text strategy, was investigated experimentally. The results showed a strong positive effect of this learning strategy compared to a conventional study-restudy condition.

"I can do both!": On-Device Multitasking Effects on Video Comprehension and Metacomprehension
Angelica Ronconi*, Lucia Mason

The study investigated the immediate and delayed effects of multitasking while learning from educational videos, specifically responding to chat messages. Results showed a negative impact on lower secondary school students' immediate comprehension and metacomprehension, likely due to disrupted processing of informational content. Students who did not multitask showed deeper comprehension compared to their peers even at a delayed post-test.

Friday, September 6th, 8.45-10.15h
SINGLE SESSION: Advances in text comprehension and graphics II

How Does a Misinformation Game Work? Effects of Evaluation Strategies and Explanations
Marc Stadtler*, Sarit Barzilai

Games can promote learners' competence to cope with misinformation, yet little is known about how misinformation games work. We examined the contribution of two misinformation game mechanics: modeling evaluation strategies and providing explanations about types of misinformation. An experimental study with 132 secondary students suggested that evaluation strategies, but not explanations, resulted in improved discernment between accurate and inaccurate messages.

Friday, September 6th, 12.00-13.15h
PARALLEL MIXED SESSION

A. Navigating the Digital Age: Understanding Metacomprehension in Multiple Documents reading - Symposium

Discussant: Veit Kubik - Chair: Lidia Altamura

This symposium aims to shed light on metacomprehension in multiple documents (MD) reading by presenting three studies from different research approaches: assessing MD metacomprehension using standardized MD reading tests in university students; fostering MD metacomprehension via a generative task in adult readers; and exploring the effects of multitasking while reading MD in secondary-school students.

Metacomprehension and multitasking while reading multiple documents in secondary school students
Lidia Altamura*, Marc Stadtler, Ladislao Salmerón

Secondary-school students engaged in a secondary task while reading conflicting texts. Half of the participants read in printed format and the other in digital. Results showed that students who faced multitasking while reading in print presented worse conflict identification. Regarding self-regulation, we found a mismatch between how well students were able to self-monitor their distraction and estimate their future performance.

Abstracts

A. Navigating the Digital Age: Understanding Metacomprehension in Multiple Documents reading - Symposium

Discussant: Veit Kubik - Chair: Lidia Altamura

I know exactly how I did, didn't I? Monitoring accuracy in multiple document comprehension
Huib Tabbers*, Carolin Hahnel, Daniel Schiffner, Cornelia Schoor

University students made a standardized multiple document comprehension test, rated their performance before and after the task, and rated interest, effort and difficulty. As expected, post-task estimates correlated higher with performance than pre-task ratings. Low performers were lowest in accuracy and mostly overestimated their performance. So students can monitor their multiple document comprehension to some degree, but improvements are required.

Enhancing metacomprehension via forum post writing and expert post comparison in multi-text reading
Corinna Schuster, Julia Waldeyer, Pia Maiwald, Marc Stadtler*

In the digital age, reading multiple texts challenges metacomprehension. An online experiment with 114 adults explores a generative task with forum posts and expert comparisons. The forum post + expert post group showed superior judgment accuracy for source-content links but not for content knowledge and intertextual conflicts. Future research should optimize generative tasks for enhanced metacomprehension in navigating multiple texts.

B. Learning with virtual reality - Paper session

Processing Uncertain Information in Immersive Virtual Reality
Manuela Glaser*, Stephan Schwan

In an empirical study, the certainty bias in learning could not be replicated in IVR. However, it occurred for learning uncertainty values. Also, visualizations of uncertainties compensated it. Fixation times were longer for uncertain than for certain information. It is discussed whether the fascination with IVR inhibited the certainty bias in learning.

Abstracts

B. Learning with virtual reality - Paper session

The use of virtual environments to train spatial abilities of primary school children
Sandra Berney*, Sophie Bénard-Linh Quang, Roland Maurer, Mireille Bétrancourt

This longitudinal study examined how to evaluate and train spatial navigation strategies using a virtual environment (Spageo City) in 7- to 10-year-old children. 460 students were included in this 3-year long study. A quasi-experimental study conducted in a school context showed that navigating in Spageo City approximatively 8 sessions a year improve children spatial orientation ability.

The relationship between visuo-spatial abilities and spatial representation of virtual environment
Sophie Bénard Linh Quang, Kilian Ciriello*, Sandra Berney*, Roland Maurer and Mireille Bétrancourt

This study investigates the role of visuospatial abilities (VSA in spatial representation of a virtual environment (VE). VSA and spatial representation were assessed in 171 adults. Findings underline the implication of VSA in constructing spatial representation, with a specific implication of perspective-taking and visualization suggesting an important role of VSA in representation of VE, with potential implications for spatial learning.

Learning about movements in virtual realities: Role of visuospatial ability and interaction formats
Birgit Brucker*, Georg Pardi, Fabienne Uehlin, Laura Moosmann, Marc Halfmann, Martin Lachmair, Peter Gerjets

Two studies investigated how different interaction formats (multiple perspectives via dynamic 3D-object-manipulation versus viewpoint-manipulation) in desktop and immersive virtual environments and learners' visuospatial abilities influence learning about movements (pictorial recognition and factual knowledge), presence, and motion sickness. Results reveal differing interactions between learners' visuospatial ability and the interaction formats in desktop and immersive virtual environments. Results and implications are discussed.

Abstracts

A. Refutation and medium effects

Promoting Meaningful Learning from Texts through Refutational, Visual, and Instructional Strategies

Johannes Kröger*, Sascha Bernholt

Texts represent a central tool for knowledge acquisition in science education. Due to misconceptions or insufficient reading skills, students often face difficulties using texts as a productive resource. The present study explores the potential of combining refutation texts and graphical organizers to scaffold readers' reading comprehension. Furthermore, the effects of instructional tasks to promote meaningful learning from texts are examined.

Do Refutation (Hyper-)texts Enhance Student Teachers' Conceptual Change?

Veronika Isabel Klara Zoe Nimsch*, Anna-Sophia Dersch, Alexander Eitel

In prior studies, refutation texts were effective in reducing teachers' misconceptions about multimedia learning, while not improving transfer. Now, we research if combining refutation texts with hyperlinks enhances conceptual change applying a 2x2-design with refutation (hyper-)texts and expository (hyper-)texts. Processing the hyperlink contents should mediate the beneficial effect of refutation hypertexts. Our findings might have implications for improving refutation texts.

Explainer Video vs. Text: Which Medium is More Effective for Refuting Misconceptions?

Marie-Christin Krebs*, Anna-Sophia Dersch, Hannah Oster, Alexander Eitel

In an online experiment with a 2x2 between-subjects design, we investigated the effect of medium (explainer videos vs. text) and refutation style (yes vs. no) on knowledge acquisition and the refutation of misconceptions about dyslexia among 275 teacher students. The initial findings suggest an interaction effect of medium and refutation style, favoring the refutation text condition in a delayed posttest.

The medium effect with VET students: Do decoding skills matter when reading on paper and screen?

Viktoria Foss*, Hildegunn Støle, Lilla Magyari

This study contributes to the body of research that compares reading comprehension on print and screen, with the hitherto unexplored reader group of vocational students. 109 participants read informational texts from authentic textbooks on their own laptops and A4 print booklets in the classroom. In line with previous research, comprehension was significantly lower on screen than in print.

Abstracts

B. Reading comprehension in Primary and Secondary school

Reciprocal development of oral and written word recognition through primary school

Johannes Naumann*, Patrick Dahdah, Julia Schindler, Maj-Britt Haffmans, Tobias Richter

The co-development of oral and written word recognition was examined in a 4-year longitudinal study with a lag-3 CLPM. As predicted by the Lexical Quality Hypothesis we found lag-1 effects of oral on written, and written on oral word recognition between grades 1 and 3. Grade 3 and 4 oral and written word recognition independently predicted grade 4 comprehension.

Reading Comprehension Assessment in Monolingual and Multilingual Students of Secondary Education

Christel Van Vreckem*, Annemie Desoete, Sofie Carnewal

Monolingual students from the 9th and 10th grade performed significantly better for reading
 comprehension compared to their multilingual classmates with medium effect sizes. The average result for reading comprehension for both groups was significantly higher one year later with a medium till high effect. Getting one year more education was effective for both groups.

The impact of an oral language intervention on reading comprehension and written composition

Dacian Dolean*, Monica Melby-Lervåg, Arne Lervåg

Theoretical frameworks of reading comprehension and written composition indicate that one of their critical predictors is oral language skills. In this study we estimated the effects of a structured, researcher-designed oral language intervention on oral language skills, reading comprehension and written composition. The results indicate positive but limited effects compared with an unstructured, teacher-designed oral language intervention.

Text comprehension as a product of multiple factors: advances from traditional models in reading

Laura Hernandez Sobrino*, Virginia González Santamaría, Eva Gutierrez-Sigut

Comprehend is not the same as independently processing all words that constitute a text. The presented study investigates reading comprehension from a multivariate perspective, with the aim to determine which of the main reading skills enables whole-message comprehension. We review traditional reading models in light of our findings.

Friday, September 6th, 15.45-17.15h
PARALLEL PAPER SESSION III

A. Source evaluation

Storifying Instructional Videos to Promote Credibility Evaluation: Examining Engagement and Learning
Riikka Anttonen*, Kristian Kiili, Eija Räikkönen, Carita Kiili

This study examines whether the storification of instructional videos induces adolescents' situational interest and positive epistemic emotions (curiosity and excitement) and enhances online credibility evaluation skills. Results showed that girls reported higher situational interest, curiosity, and excitement when following non-storified videos than storified ones. Boys reported the opposite. Storified and non-storified instruction promoted students' credibility evaluation skills similarly.

Video-Based Instruction Promoting Sixth Graders' Online Credibility Evaluation
Carita Kiili*, Julie Coiro, Kristian Kiili, Eija Räikkönen

This study tested the efficacy of video-based instruction in promoting sixth graders' online credibility evaluation. Students participated in either storified (N = 119) or non-storified video-based instruction (N = 135) that was 4 x 45 minutes long. In addition, 127 students served as a control group. Storified and non-storified video-based instruction promoted students' credibility evaluation equally well.

School students rely on their own opinion rather than the source expertise when evaluating videos
Brivaël Hémon, Bastien Trémolière, Amaël Arguel, Franck Amadieu, Kévin De Checchi*

This study focuses on understanding how students evaluate informational videos. Students (N = 418) watched videos and were asked to assess sources and information, whether they would use videos and to explain why. Results showed that students poorly consider the expertise of the source, whereas they mainly rely on congruence with their own beliefs to explain their choice.

Openness and epistemic justifications predict tendency to favor videos featuring experts
Brivael Hémon*, Kévin De Checchi, Amaël Arguel, Bastien Trémolière, Franck Amadieu

This study aims to identify predictors of consideration of sources' expertise when evaluating the quality of informative videos. Secondary education pupils (N = 364) evaluated sources and information in four videos, then answered critical thinking dispositions scales. The tendency to favor experts (vs. layperson) in videos is mostly predicted by the openness to revise one's viewpoint and video epistemic justifications.

Friday, September 6th, 15.45-17.15h
PARALLEL PAPER SESSION III

B. Multimedia and seductive details

Static Versus Dynamic Representational and Decorative Pictures in Word Problems: Less Might be More
Marlit Annalena Lindner*, Tom Ehrhart, Simon Grund, Tim Höffler

Digital assessments allow incorporating complex visualizations into test items. But is investing into dynamic pictures worthwhile? This 3×2 mixed-design experiment with 308 school students shows that static representational pictures improved student performance and satisfaction, whereas decorative pictures did not show beneficial effects. Overall, dynamic picture design failed to provide benefits over static pictures that would justify the additional construction effort.

Laughing Their Heads off: When Teacher Humor Acts as a Seductive Detail
Lisa Bender, Alexander Renkl, Tino Endres*

Does course-related teacher humor act as a seductive detail (i.e., negative effects on learning) only when it is irrelevant for the learning goal? A 2x2 between-subjects study (N=116) with presence of humor and illustrative character (i.e.,relevance) as factors revealed a negative seductive-detail effect of irrelevant teacher humor on transfer.Relevant teacher humor did not harm, nor enhance learning.

Do inhibition abilities influence the effects of animations combined with seductive details?
Tiphaine Colliot*, Jean-Michel Boucheix

The purpose of the present study was to assess the effects of animated versus static pictures combined with the effects of the presence or the absence of seductive details on children's performance. The specificity of the present study relies in the fact that we measured how students' inhibition abilities influenced these effects.

Does need for cognition moderate the effect of stepwise fade-in in videos with narrated slides?
Christina Sondermann*, Ronja Spieckermann, Hannes Schröter, Martin Merkt

The online experiment investigated whether the effect of stepwise (vs. static) presentation of narrated slides was moderated by need for cognition (NFC). Whereas NFC was positively related to knowledge test performance, it did not moderate the negative effect of stepwise presentation on knowledge test performance. NFC and presentation type did not affect recognition of pictures from the slides.

Friday, September 6th, 15.45-17.15h
PARALLEL PAPER SESSION III

B. Multimedia and seductive details

Comic-based Storytelling in STEM Instruction Isn't Superior to Classical Worksheets
Marc Rodemer*, Nils Ullenboom

This study investigated comic-based storytelling compared to traditional worksheets. The findings indicate that both instructional methods yield comparable learning gains. Surprisingly, perceived ease was only correlated with performance in the worksheet condition. However, perceived comprehensiveness correlated with performance in both conditions. The results suggest that comic-based storytelling serves as a viable methodological variation, neither enhancing nor impeding student learning gains.