PERSONAL INFORMATION

# Roxana-Mădălina CRISTEA

WORK EXPERIENCE

01/10/2019 – Current

## PhD Candidate - with Ministry of Education Grant

Babeş-Bolyai University; Faculty of Psychology and Educational Sciences; Doctoral School "Didactics. Tradition. Development. Innovation"

- Research activities;
- Writing and publishing research papers, articles, and dissertations, as well as book editing;
- Training at Bachelor's degree-level seminars, including preparing materials, delivering lectures, and grading assignments;
- Teacher training activities in Technological Pedagogical Content Knowledge (TPACK); Virtual Environment Learning; Digital Learning Tools and Platforms; Designing and manufacturing technical products; Metacognition and Metacognitive Scaffolding; Inquiry-Based learning and Visible learning; Professional competencies and analysis of training needs; Didactic expertise. Professional development paths; Using Focus Groups in Schools and Education Research; Teaching and assessment methods;
- Administrative and service roles, including serving on departmental or university committees for new course development, student affairs, and Master's degree admissions;
- Event organization: workshops and conferences;
- Writing grants;
- Community engagement to apply research findings and contribute to public understanding of educational issues.

Business or sector Research and education

10/2019 – Current

## Editorial board member and reviewer at Acta Didactica Napocensia Review

Babeș-Bolyai University; Faculty of Psychology and Educational Sciences; Department of Didactics of Exact Sciences;

- manuscript review and evaluation;
- ensuring editorial quality and adherence to ethical standards;
- mentorship and guidance for less experienced authors and new reviewers.

Business or sector Research and education

08/2023

## Teacher training at Ș.T.I.M. Tradiții Summer School *The Power of the 3R's: Reduce, Reuse, Recycle* ["Puterea celor 3R: Reducere, Refolosire, Reciclare"]

Ș.T.I.M. Tradiții Association & Vocational School Sâg, Sălaj, Romania;
https://www.sportulsalajean.ro/?p=213771

- Robotics and STREAM Education – Introduction to Astro Pi

Business or sector Non-Governmental Organization (NGO) – Education & Environment

03/2023

## Evaluator within the National Recovery and Resilience Programs for equipping schools

Executive Agency for Higher Education, Research, Development and Innovation

- Project assessment

Business or sector Education

08/2022

## Teacher training at Ș.T.I.M. Tradiții Summer School

Ș.T.I.M. Tradiții Association, Subcetate, Sălaj, Romania

- Metacognition in education [Metacogniția în educație]

Business or sector Non-Governmental Organization (NGO) – Education & Environment

03/2022

## Evaluator within the National Recovery and Resilience Programs for reducing school dropout

Executive Agency for Higher Education, Research, Development and Innovation

- Projects' assessment

Business or sector Education

07/2021 & 09/2021

### Member of the technical support team for Master's degree admissions

Babeș-Bolyai University; Faculty of Psychology and Educational Sciences; Department of Didactics of Exact Sciences;

- verification and archiving of candidates' files;
- entering data into the computer system for calculating the admission averages;
- generation and transmission of registration forms to the secretariat;
- providing information and technical support to candidates.

Business or sector Administrative Support & Data Management

2013 – 2019

### Psychologist

Private practice;

- cognitive behavioral counseling;
- cognitive behavioral psychotherapy.

Business or sector Mental Health & Counselling

## EDUCATION AND TRAINING

03/2025 - Current

### Postgraduate studies in Applied Informatics and Programming

Technical University of Cluj-Napoca

01/10/2019 – Current

### Doctoral studies in Educational Sciences

Babeş-Bolyai University; Faculty of Psychology and Educational Sciences; Doctoral School "Didactics. Tradition. Development. Innovation"

2023 – 2024

### Teacher Education Certificate Level II

Babes-Bolyai University; Department for Teacher Training

- Psycho-pedagogical, didactic, and practical training to certify teaching skills for filling Psychology teaching positions in high school, post-secondary, and university education.

2022 – 2023

### Teacher Education Certificate Level I

Babes-Bolyai University; Department for Teacher Training

- Psycho-pedagogical, didactic, and practical training to certify teaching skills for filling Psychology teaching positions in compulsory pre-university education.

10/2014 – 06/2016

### Master's Degree in Psychological Techniques of Behavior Management and the Development of Human Potential

Babes-Bolyai University; Faculty of Psychology and Educational Sciences

10/2012 – 06/2014

### Master's Degree studies in Health Psychology

Babes-Bolyai University; Faculty of Psychology and Educational Sciences

10/2009 – 06/2012

### Bachelor's Degree in Psychology

Babes-Bolyai University; Faculty of Psychology and Educational Sciences

10/2007 – 06/2009

### Master’s Degree studies in School Counselling and Psycho-pedagogical Assistance

Babes-Bolyai University; Faculty of Psychology and Educational Sciences

10/2003 – 06/2007

### Teacher Education Certificate

Babes-Bolyai University; Faculty of European Studies

- Psycho-pedagogical, didactic, and practical training to certify teaching skills for teaching positions in compulsory pre-university education.

10/2003 – 06/2007

### Bachelor's Degree in International Relations and European Studies Education

Babes-Bolyai University; Faculty of European Studies.

## PERSONAL SKILLS

Mother tongue(s) Romanian

Other language(s)

| | UNDERSTANDING | | SPEAKING | | WRITING |
|---|---|---|---|---|---|
| | Listening | Reading | Spoken interaction | Spoken production | |
| English | C2 | C2 | C1 | C2 | C1 |
| French | C2 | C2 | C1 | C1 | C1 |
| Spanish | C2 | C1 | C1 | C2 | C1 |
| Italian | C2 | C2 | C2 | C2 | C1 |
| Portuguese | C2 | C2 | B2 | B2 | B2 |
| German | A2 | A2 | A1 | A1 | A1 |

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
Common European Framework of Reference for Languages

Communication skills

- good communication skills developed through networking and building professional relationships with peers and professionals from national and international educational institutions at scientific events and collaborations and also through my experience as English Session Chair at The Doctoral Students' Conference: Tradition, Development & Innovation in Didactics (TDID), organized by the "Didactics: Tradition, Development & Innovation" Doctoral School at Babeș-Bolyai University & Linz School of Education at Johannes Kepler University, online conference - editions 2020 – 2025.

Organisational/managerial skills

- Team spirit and strong organizational skills: I have gained teamwork experience through practical activities carried out during my studies and volunteer work within NGOs, specifically at the Day Center "Școala Christiana" in Cluj-Napoca and the "Familia Regăsită" Association.
- Experience in event organization as a member of the organizing team for the Doctoral Students' Conference: Tradition, Development & Innovation in Didactics, editions 2020 – 2025.

Digital skills

- advanced proficiency in MS Office (Word, Excel, PowerPoint, Publisher, Outlook Express)
- advanced proficiency in SPSS – Statistical analysis, data processing, and interpretation; Atlas.ti – Qualitative data analysis, coding, and thematic analysis;
- good command of photo and video editing software: Canva, Adobe Photoshop, Camtasia;
- good command of educational technology tools like Raspberry Pi, Arduino, Eon-XR, Bubble.us, CmapsTools, Tinkercad, Scratch, LEGO Education SPIKE Essential.
- Database creation and management – SQL
- Web application development – HTML, CSS
- Programming – C (Programming Language)

## ADDITIONAL INFORMATION

Certifications/ Continuous training

- 03/2025: evaluator at the Regional Competition *Be a science teacher for a week!* [*„Fii, o săptămână, profesor de ştiinţe!"*], Ministry of Education and Research, Cluj County School Inspectorate, Technical College of Energy, Cluj-Napoca
- 03/2024: Teach with Earth from Space Workshop, e-Technology Lab, European Space Agency (ESA) – ESEC Galaxia, Belgium.
- 06/2023: Space Robotics Workshop, e-Technology Lab, European Space Agency's ESEC-Galaxia, Belgium.
- 11/2023: Teach with the Moon Workshop, e-Technology Lab, European Space Agency's ESEC-Galaxia, Belgium.
- 07/2021: Certificate of Completion for the Professional Training Program – Specialization in Entrepreneurial Competencies, organized by Babeș-Bolyai University, Cluj.
- 26.05.2021: Participation in the Workshop "Insights on Academic Writing"; Trainer: Prof. Alexandru Minea; Event organized online within the CNFIS-FDI-2021-0042 project: "Quality Education at Babeș-Bolyai University V".
- 03/2021: EON-XR Educator Certificate, EON Reality, online course.
- 24.06.2020: Workshop Participation at "Academic Writing: Scientific Article Writing, Publishing, and Research Ethics"; Trainer: Prof. Alexandru Minea (Université d'Auvergne, Clermont-Ferrand, France); Event held online within the CNFIS-FDI-2020-0102 project: "Quality Education at Babeș-Bolyai University IV".

- 11/ 2019: Workshop Participation at "Gamification in University Education: Foundations and Strategies"; Trainers: Prof. Dr. Adrian Opre, Conf. Dr. Adina Glava, Lect. Dr. Ramona Buzgar; Event organized within the CNFIS-FLD-2019-0111 project: "Quality Education at Babeș-Bolyai University, III".
- 31.10.2015 - 1.11.2015: Participation at Counselling Children and Adolescents Workshop; Trainer: Dr. Ann Vernon; Organizers: Albert Ellis Institute & International Association of Cognitive Behavioral Coaching.
- 04-05/2014: Transnational Collaborative Research Project – Health Behavior in School-aged Children (HBSC), WHO; Organizers: World Health Organization (WHO) & Babes-Bolyai University; Role: Data Collection Operator.
- 08/10/2012: TEMPEST Workshop – "Temptations to Eat Moderated by Personal and Environmental Self-Regulatory Tools", organized by Seventh Framework Programme (FP7) & Babeș-Bolyai University, Cluj-Napoca
- 2012: Trainer Certification accredited by the National Council for Adult Vocational Training (CNFPA)

## Projects

- 09/2024 – 01/2025: AquaRevivus – Empowering Citizens and Industries to Monitor and Reduce Water Consumption while Promoting Recycling; Project Description: AquaRevivus is a collaborative initiative aimed at raising awareness and providing practical solutions for monitoring and reducing water consumption, while also promoting sustainable recycling practices; Organizers: Implemented through a collaboration between CSInnoHub, the Open Science Office of Babeș-Bolyai University, the Faculty of Mathematics and Computer Science, and the Faculty of Psychology and Educational Sciences. Role: Member of the project writing team.

- 1/04/2021 – 31/03/2022: "Operational Programme Human Capital 2014-2020, Project No. POCU 123793: 'Researcher, Future Entrepreneur – New Generation' (SMIS Code: 123793); Priority Axis: 6 – Education and Skills; Contract Number: POCU/380/6/13 no. 37217/23.05.2019; Role in the Project: researcher.

- 04 – 05/ 2011, 2012 & 2013: Participation at POSDRU/86/1.2/S/60281 – Strengthening Competence-Oriented Higher Education; Priority Axis: AP 1 – Education and Vocational Training for Economic Growth and Knowledge-Based Society Development; Major Area of Intervention / Operation: DMI 1.2 – Quality in Higher Education; Project Director: Prof. Sofia Chirică; Organizer: Babes-Bolyai University.

## Honours and awards

- 1/04/2021 – 31/03/2022: Entrepreneurial Scholarship under the Operational Programme Human Capital 2014-2020, project no. POCU 123793 Researcher, future entrepreneur – New Generation, Code (SMIS): 123793, Priority Axis: 6 – Education and Skills, Contract Number: POCU/380/6/13 nr. 37217/23.05.2019, Role in the Project: researcher.

- 2022: Individual Entrepreneurial Project Prize in the Operational Programme Human Capital 2014-2020, project no. POCU 123793 Researcher, future entrepreneur – New Generation, Code (SMIS): 123793, Priority Axis: 6 – Education and Skills, Contract Number: POCU/380/6/13 no. 37217/23.05.2019, Role in the Project: researcher.

- 10/2019 – 09/2022: Doctoral student grant, Ministry of Education.

## Memberships

- Member of the Romanian Association for Research in Education (ARCE).
- Member of the Association for Teacher Education in Europe (ATEE).

## Conference presentations (selection)

- Cristea, M., Ciascai, L. (2025). Enhancing Digital and Metacognitive Competence through a TPACK-Based Scaffolded Intervention in Pre-Service Primary School Teacher Education. Association for Teacher Education in Europe (ATEE) - Annual Conference, Marino Institute of Education, Dublin, Ireland.
- Cristea, M., Ciascai, L. (2025). Exploring the Relationships Between Digital Competence, Metacognitive Awareness, and Teachers' Virtual Learning Environment Success. World Federation of Associations for Teacher Education (WFATE), 8th Biennial Conference & Association for Teacher Education in Europe (ATEE) - Spring Conference, Rovira i Virgili University, Tarragona.

Conference presentations (selection)

- Cristea, M., Ciascai, L. (2025). Enhancing Digital and Metacognitive Competence through a TPACK-Based Scaffolded Intervention in Pre-Service Primary School Teacher Education. “The Future of Higher Education – evidence-based approaches and practices” Conference, Babes-Bolyai University, Cluj-Napoca, Romania.
- Facler, M., & Cristea, M. (2025). Adapting to Personalized Digital Learning Environment: A Comparative Study of Teacher Practices Between Romania and Israel. The Mobile Learning 2025 International Conference, IADIS – International Association for the Development of the Information Society, Madeira, Portugal.
- Cristea, R.-M. (2024). Investigating the Relationships Between In-Service Teachers’ Technology Pedagogy Content Knowledge and Virtual Learning Environment Success [Paper presentation & Session Chair]. Doctoral Students' Conference: Tradition, Development & Innovation in Didactics - Early Career Researchers Conference (TDID - ERC), Didactics: Tradition, Development & Innovation” Doctoral School at Babeș-Bolyai University & Linz School of Education at Johannes Kepler University, online conference.
- Facler, M., Cristea, M., Șuteu, L., Opriș, D., & Ciascai, L. (2024). Integrating TPACK and Personalized Learning Approaches in Teachers' Virtual Environment Teaching Practices: A Comparative Study Between Romania and Israel. Doctoral Students' Conference: Tradition, Development & Innovation in Didactics - Early Career Researchers Conference (TDID - ERC), Didactics: Tradition, Development & Innovation” Doctoral School at Babeș-Bolyai University & Linz School of Education at Johannes Kepler University, online conference.
- Cristea, R.-M. (2024). Investigating The Relationships Between In-Service Teachers’ Technological Pedagogical Content Knowledge and Virtual Learning Environment Success. ATEE Annual Conference 2024 'Teacher education research in Europe: trends, challenges, practices and perspectives', Bergamo, Italy.
- Cristea, R.-M. (2023, November 22-24). Exploring the Relationship Between Virtual Learning Success and the Integration of Technology Pedagogy Content Knowledge (TPACK) into Pre-Service Teachers' Practice [Paper presentation]. Doctoral Students' Conference: Tradition, Development & Innovation in Didactics - Early Career Researchers Conference (TDID - ERC), Didactics: Tradition, Development & Innovation” Doctoral School at Babeș-Bolyai University & Linz School of Education at Johannes Kepler University, online conference.
- Cristea, R.-M. (2023). Teachers' Digital and Metacognitive Competence Profiles and the Virtual Learning Environment Success. In Classroom Practice [Paper presentation]. ATEE Annual Conference 2023 'Teacher Education on the Move', Budapest, Hungary.
- Cristea, M. & Șuteu (Haiduc), L. (2022, December 15-16). Perceived Well-being of In-Service School Teachers [Paper presentation]. Doctoral Students' Conference: Tradition, Development & Innovation in Didactics - Early Career Researchers Conference (TDID - ERC), Didactics: Tradition, Development & Innovation” Doctoral School at Babeș-Bolyai University & Linz School of Education at Johannes Kepler University, online conference.
- Cristea, M. (2022, May 30-31). Teachers' digital and metacognitive competence profiles in the virtual learning environment perspectives [Paper presentation]. Building Bridges in STEAM Education in the 21st Century. First International Conference, Porto Accounting and Business School, Porto School of Engineering & Polytechnic of Porto, Porto, Portugal.
- Cristea, M. Șuteu, L., Ciascai, L. & Magdaș, I. (2021, June 24). Epistemological Beliefs as A Predictor of Metacognitive Awareness: Pre-University Teaching Practice Implications [Paper presentation]. The 10th International Conference Education, Reflection, Development, Babes-Bolyai University, Cluj-Napoca – Romania, online conference.
- Cristea, M. (2022, March 28-30). Pre-university teachers’ experiences with digital learning technologies: a thematic analysis [Paper presentation]. Entrepreneurship and Research Conference: Digital Transformation, Faculty of Economic Sciences and Business Management, Cluj-Napoca, Romania, online conference.
- Cristea, R-M. (2021, December 2-3). The Zone of Proximal Development and Teaching Expertise in Classroom Settings [Paper presentation]. Doctoral Students' Conference: Tradition, Development & Innovation in Didactics - Early Career Researchers Conference (TDID - ERC), “Didactics: Tradition, Development & Innovation” Doctoral School at Babeș-Bolyai University & Linz School of Education at Johannes Kepler University, online conference. https://sddid.psiedu.ubbcluj.ro/TDID2021/site/Abstracts%20EN.pdf
- Cristea, M., Facler, M., Șuteu, L., Ciascai, L., Magdaș, I. (2021, October 28-30). University Students Perception about Learning Technology: A Thematic Analysis [Paper presentation]. 12th World Conference on Learning, Teaching and Educational Leadership, online conference.
- Cristea, M., Facler, M., Șuteu (Haiduc), L., Ciascai, L., & Magdaș, I. (2021, June 25). Pre-university teachers’ digital competence and wellbeing: an Israeli and Romanian comparative study [Paper presentation]. The 9th International Conference Education, Reflection, Development, Babes-Bolyai University, Cluj-Napoca – Romania, online conference.
- Cristea, M. (2020, May 14-16). The Involvement of Romanian Pre-university Teachers in Lifelong Learning: A Comparative Analysis [Paper presentation]. Doctoral Students' Conference: Tradition, Development & Innovation in Didactics (TDID), Didactics: Tradition, Development & Innovation” Doctoral School at Babeș-Bolyai University & Linz School of Education at Johannes Kepler University, online conference.

**Conference presentations (selection)**

- Cristea, M. & Haiduc, L. (2011, May 13-15). Even Teachers Learn! Lifelong Learning as Perceived by Romanian Teachers [Paper presentation]. TEPE Conference 2011: Research-Based Teacher Education Reform: Making Teacher Education Work. Vienna, Austria. https://tepe2011.univie.ac.at/index.php?id=101919

**Publications**
**Books/chapters**

- Șuteu, L., **Cristea, M.,** Magdaș, I. & Ciascai, L. (in press). Integrating circular economy principles in the non-formal STEAM educational framework. Chapter IX. In D. Mara & M. Bocoș (Eds.), Insights in non-formal education in the actual society. Edizioni ETS.
- Șuteu, L., **Cristea, M.** & Ciascai, L. (2024). Developments in STEM education: STEAM, STREAM and Inquiry-based learning [Dezvoltari in educatia STEM: STEAM, STREAM si invatarea bazata pe investigatie]. Presa Universitara Clujeana. https://doi.org/10.52257/9786063721939 http://www.editura.ubbcluj.ro/bd/ebooks/pdf/4181.pdf
- **Cristea, M.** (2024). Aspects of Implementing Lego Educational Robotics in Primary Education. [Aspecte ale implementării roboticii educaționale Lego în învățământul primar]. In Șuteu, L., Cristea, M. & Ciascai, L. (Eds.) (2024). *Developments in STEM education: STEAM, STREAM and Inquiry-based learning [Dezvoltari in educatia STEM: STEAM, STREAM si invatarea bazata pe investigatie].* Presa Universitara Clujeana. https://doi.org/10.52257/9786063721939 http://www.editura.ubbcluj.ro/bd/ebooks/pdf/4181.pdf
- **Cristea, M.** (2024). Educational Project Management: Best Practices for Developing a STEM Laboratory. [Managementul proiectelor educaționale. Bune practici pentru dezvoltarea unui laborator STEM]. In Șuteu, L., **Cristea, M.** & Ciascai, L. (Eds.) (2024). *Developments in STEM education: STEAM, STREAM and Inquiry-based learning [Dezvoltari in educatia STEM: STEAM, STREAM si invatarea bazata pe investigatie]*. Presa Universitara Clujeana. https://doi.org/10.52257/9786063721939 http://www.editura.ubbcluj.ro/bd/ebooks/pdf/4181.pdf

**Studies published in international volumes**

- **Cristea, R.-M**. (2025). Investigating the Relationships between In-service Teachers' Technology Pedagogy Content Knowledge and Virtual Learning Environment Success. In N. Bianquin, & F. Magni (Eds.), *Book of Proceedings ATEE Spring Conference 2024. Teacher education research in Europe: trends, challenges, practices and perspectives.* (pp. 432-438). Bergamo: Università degli studi di Bergamo. https://doi.org/10.62336/unibg.978-88-97253-27-3
- **Cristea, M.,** Șuteu, L., Ciascai, L., & Magdaș, I. (2023). Epistemological Beliefs as a Predictor of Metacognitive Awareness: Pre-University Teaching Practice Implications. In I. Albulescu & N. Stan (Eds.), *European Proceedings of Educational Sciences*, *6,* 139-147. European Publisher. https://doi.org/10.15405/epes.23056.13
- **Cristea, M.,** Facler, M**.,** Șuteu (Haiduc), L., Ciascai, L., & Magdaș, I. (2022). Pre-university teachers' digital competence and wellbeing: an Israeli and Romanian comparative study. In I. Albulescu & N. Stan (Eds.), *European Proceedings of Social and Behavioural Sciences, 2* (pp. 529-538). European Publisher. https://doi.org/10.15405/epes.22032.53.
- Șuteu (Haiduc), L., **Cristea, M.,** & Ciascai, L. (2021). Reflective teaching and metacognition in Romanian teachers' practice. A conceptual delimitation. In I. Albulescu & N. Stan (Eds.), *European Proceedings of Social and Behavioural Sciences*, 104 (pp. 113-124). European Publisher. https://doi.org/10.15405/epsbs.2021.03.02.13
- **Cristea, R.-M**. (2022). *Pre-university teachers' experiences with digital learning: a thematic analysis*. In I. Hosu, L. Culic & A. Voina (Eds.), Entrepreneurship Through Digital Transformation and Social Changes (pp. 147-154). Presa Universitară Clujeană. http://www.editura.ubbcluj.ro/bd/ebooks/pdf/3454.pdf
- Șuteu (Haiduc), L., **Cristea, M.,** & Ciascai, L. (2020). Teachers' self-regulated beliefs and practices in the classroom context. In L. G. Chova, A. Lopez & I. C. Torres (Eds.), *ICERI2020 Proceedings* (pp. 8010-8015). IATED. https://dx.doi.org/10.21125/iceri.2020.1773

Articles/studies published in specialized journals of international circulation recognized or in national journals recognized by CNCSIS

- **Cristea, M.,** Șuteu, L., Langa, C., Facler, M., Opriș, D., & Ciascai, L. (in press). Exploring the integration of TPACK and personalized learning in virtual teaching: A comparative analysis of practices in Romania and Israel. *Journal of Educational Sciences & Psychology.*
- Şuteu, L., **Cristea, M.,** Magdaş, I., & Ciascai, L. (2024). Investigating the relationship between metacognition and STREAM education in science: an exploratory study. Revista Românească pentru Educaţie Multidimensională, 16(1), 30- 45. https://doi.org/10.18662/rrem/16.1/810 https://lumenpublishing.com/journals/index.php/rrem/article/view/6599/4754 **WOS:001208109100015**
- Șuteu (Haiduc), L., **Cristea, M.,** & Ciascai, L. (2021). The relationship of gender with reading performance, reading enjoyment, perceived ability, and perceived difficulties in a sample of Romanian students. Journal of Educational Sciences & Psychology, XI (LXXIII)(1). https://doi.org/10.51865/JESP.2021.1.08 https://jesp.upg-ploiesti.ro/phocadownload/jurnal_2021_1/08.pdf **WOS:000715764100008**
- Ilie, S.A. & **Cristea, M.** (2020). The educational film used in the study of plant development according to the environment. Romanian Review of Geographical Education, 9(1), 60-81. https://doi.org/10.24193/RRGE120204 https://rrge.reviste.ubbcluj.ro/Arhive/Art%20pdf/v9_n1_2020/4_Ilie_Cristea_RRGE_vol%20IX_no_1_2020.pdf
- Ciascai, L., Șuteu (Haiduc), L. & **Cristea, M.** (2019). Students Future Teachers for Primary Schools Opinion about the University Openness Towards Innovation. Acta Didactica Napocensia, 12(2), 45-50. https://doi.org/10.24193/adn.12.2.4 https://files.eric.ed.gov/fulltext/EJ1238618.pdf