

# Sélection d'articles en didactique de la chimie

**Fix Me!**

à ajouter :

- <https://dvillers.umons.ac.be/wiki/teaching:biblio-10.1021-ed2001957>

Liens rapides :

- <http://pubs.acs.org/toc/jceda8/current> : **numéro courant de Journal of Chemical Education** où vous avez la possibilité de consulter les résumés. Si vous souhaitez recevoir la table des matières à chaque nouveau numéro, il vous suffit de prendre l'option "register" (<https://account.acs.org/ssoamweb/account/signUp>), et ensuite de demander les "E-Mail Alerts" pour les journaux choisis. Pour les étudiants et le personnel UMONS, vous pouvez accéder aux textes complets sur le réseau de l'UMONS ou en activant le [VPN](#), ou via le [bureau à distance](#).
  - [Fil RSS des derniers articles parus dans Journal of Chemical Education](#)
- **Chemistry Education Research and Practice : journal de la Royal Society of Chemistry**, accessible sur inscription. Vous pouvez obtenir des alertes via la page <http://www.rsc.org/Publishing/Journals/forms/V5profile.asp>, ainsi que pour [Education in chemistry](#).
  - [Fil RSS des derniers articles parus dans Chemistry Education Research and Practice](#)
- [The Chemical Educator - table of contents](#)
- [Publications intéressantes \(résumés\)](#) (sélections d'articles discutés lors de séminaires internes, sur ce wiki)
- [Publications intéressantes de chimie-physique](#), pour travaux personnels d'étudiants,...

Dans les listes qui suivent, certains articles concernent l'enseignement supérieur et présentent donc un intérêt relatif par rapport au secondaire.

## Articles de Journal of Chemical Education

### ASAP and/or ACS Editors Choice articles

- ...

### Virtual Issues

- [Journal of Chemical Education - Resources for Teaching Your Chemistry Class Online: A Free to Read Collection from the American Chemical Society & the ACS Division of Chemical Education](#)
- [Laboratory Learning](#)
- [Introducing the Virtual Issue: George M. Bodner Festschrift Marcy Towns, 2021](#) → [sélection](#)

d'articles sur :

- Constructivism as a Lens for Understanding Student Learning
- Student Conceptualization of Organic Reactions
- Understanding Student Approaches to Problem Solving
- Visualization and Spatial Reasoning Skills in Chemistry Education
- Conceptual Understanding of Chemistry

Cf. aussi le lien [virtual collections](#).

## 2024

- [Journal of Chemical Education - Vol 101, No 1](#)
  - [Improving the Understanding of Chemistry by Using the Right Words: Why Is Talking about Compounds so Messy?](#)
  - [A Polymer Degradation and Remanufacturing Experiment in the High School Classroom](#)
  - [Density Functional Calculations on H<sub>2</sub> Using 1s Slater Type Orbitals](#)

## 2023

- [Journal of Chemical Education | Vol 100, No 11](#)
  - [How Effective are Indicators for Individuals with Color Vision Deficiency? | Journal of Chemical Education](#)
- [Journal of Chemical Education - Vol 100, No 10](#)
  - [Working Together: Chemical Safety and Education](#)
  - [ChatGPT Needs a Chemistry Tutor Too](#)
  - [Systems Thinking in Chemistry and Chemical Education: A Framework for Meaningful Conceptual Learning and Competence in Chemistry](#)
  - [Introductory Organic Chemistry \(First-Semester\) for Blind and Visually Impaired Students: Practical Lessons and Experiences](#)
  - [Lighting Up for Learning—Fluorescence Analysis of Microplastic Particles by Secondary School Students Using Nile Red](#)
  - [Quantifying the Dynamics of the Candy Cola Soda Geyser Using a Simple and Inexpensive Protocol](#)
- [Journal of Chemical Education - Vol 100, No 9](#)
  - [Statistical Analysis in a Longitudinal Study of the Implementation of Process Oriented Guided Inquiry Learning at Norwich University](#)
  - [Development and Use of Flowchart for Preservice Chemistry Teachers' Problem Solving on the First Law of Thermodynamics](#)
  - [Development, Implementation, and Evaluation of a Pre-service Chemistry Teacher Preparation Unit on Fostering Pedagogical Scientific Language Knowledge](#)
  - [Introduction of Formative Assessment Classroom Techniques \(FACTs\) to School Chemistry Teaching: Teachers' Attitudes, Beliefs, and Experiences](#)
  - [A Modern Twist on an Old Measurement: Using Laboratory Automation and Data Science to Determine the Solubility Product of Lead Iodide](#)
  - [The Effectiveness of the Competence Approach in the Training of Chemistry Teachers](#)
  - [Experiences with Student Projects Focusing on Chemistry Shows in Undergraduate Chemistry Teacher Education](#)
  - [Eutectics in Pharmacy Curriculum: A Simple Demonstration with Pharmaceutical](#)

- Relevance
  - Mobile App to Quantify pH Strips and Monitor Titrations: Smartphone-Aided Chemical Education and Classroom Demonstrations
- Journal of Chemical Education - Vol 100, No 8
  - More than Marshmallows: Implementation and Assessment of an Interactive In-Class Activity for Learning VSEPR Theory
  - A Review of Research on the Quality and Use of Chemistry Textbooks
  - Design and Conduct of Lab@Home Chemistry Experiment: The Effect of Strong Acid and Base on Buffered and Unbuffered Systems
  - Quantitative Assessment on the Effectiveness of a Formal Charge Method for Constructing Lewis (Electron Dot) Structures
  - "Atomizados": An Educational Game for Learning Atomic Structure. A Case Study with Grade-9 Students with Difficulties Learning Chemistry
- Journal of Chemical Education - Vol 100, No 7
  - Epistemological Lessons from Inconsistencies in Teachers' Errors Related to Use of the Mole Ratio in Stoichiometry Calculations: A Cue for Professional Development
- Journal of Chemical Education - Vol 100, No 6
  - Experiences with Flipped Classroom Methodology in US High School Chemistry Courses: Lessons Learned from Action Research Projects
  - ChemVLab+: Integrating Next Generation Science Standards Practices with Chemistry
  - Development of an Inexpensive, Rapid Method to Measure Nitrates in Freshwater to Enhance Student Learning
  - Solving Redox Reactions: The Advantages of the Thermodynamic Method
  - Green Chemistry Teacher Professional Development in New York State High Schools: A Model for Advancing Green Chemistry
  - Investigating Preservice Chemistry Teachers' Understanding and Views about the Diversity of Scientific Methods
  - Exploring Science Literature: Integrating Chemistry Research with Chemical Education
  - Dissolution of Calcium Hydroxide in Water: A Guided Inquiry in University and High School Chemistry Laboratories
  - Chemistry and Chaos: A Role-Playing Game for Teaching Chemistry
  - Introducing Pharmaceuticals to Middle School Students using with Hypothesis-Driven, At-Home Activities **intérêt pharmaceutique**
- Journal of Chemical Education - Vol 100, No 5
  - Chemistry Education Research at a Crossroads: Where Do We Need to Go Now?
  - Effective Pedagogical Approaches Used in High School Chemistry Education: A Systematic Review and Meta-Analysis
  - Investigating the Use of an Artificial Intelligence Chatbot with General Chemistry Exam Questions
- Journal of Chemical Education - Vol 100, No 4
  - Was This Title Generated by ChatGPT? Considerations for Artificial Intelligence Text-Generation Software Programs for Chemists and Chemistry Educators
  - Potential ChatGPT Use in Undergraduate Chemistry Laboratories
  - An Experimental Approach with a Twist: Helping High School Students to Understand the Concept of Limiting Reactant
  - Features of Immersive Virtual Reality to Support Meaningful Chemistry Education
  - Alcohol or Ethanol? Teaching Organic Chemistry Nomenclature in an Informal Environment
- Journal of Chemical Education - Vol 100, No 3
  - Proposal for a Didactic Tool on Teaching Practices Related to the Selective Sorting of Plastic Waste According to Relative Density in High Schools: Case Study in Burkina Faso

- [Computer-Aided Drug Design Project for Introductory High School Students](#) **intérêt pharmaceutique**
- [Interlocking Toy Bricks Help Nursing Students “Handle” Valence Electrons, Molarity, Solubility, and More!](#)
- [Chem’Sc@pe: an Organic Chemistry Learning Digital Escape Game](#)
- [A Simple and Inexpensive Invisible Ink System Based on Red Cabbage Extracts](#)
- [Journal of Chemical Education - Vol 100, No 2](#)
  - [A Low-Cost Dual-Beam Smartphone Visible Spectrometer](#)
  - [A Simple At-Home Titration: Quantifying Citric Acid in Lemon Juice with Baking Soda and Mentos](#)
  - [An Alternative Experimental Procedure to Determine the Solubility of Potassium Nitrate in Water with Automatic Data Acquisition Using Arduino for Secondary School: Development and Validation with Pre-Service Chemistry Teachers](#)
  - [Step by Step to Make Augmented Reality Filters for Molecular Models](#)
  - [BasePairPuzzle: Molecular Models for Manipulating the Concept of Hydrogen Bonds and Base Pairs in Nucleic Acids](#)
  - [Periodic Table of Ladder: A Board Game to Study the Characteristics of Group 1, Group 17, Group 18, and the Transition Elements](#)
  - [Will It Rust? A Set of Simple Demonstrations Illustrating Iron Corrosion Prevention Strategies at Sea](#)
- [Journal of Chemical Education | Vol 100, No 1](#)
  - [Didactic Reasoning about Using Chemicals in Teaching Upper Secondary Chemistry](#)
  - [Educational Metal–Air Battery](#)
  - [An Experiment of Chemistry with Historical Context: 18th-Century Potash Production in Brazil](#)
  - [ChemEscape: Redox and Thermodynamics–Puzzling Out Key Concepts in General Chemistry](#)

## 2022

- [Journal of Chemical Education | Vol 99, No 12](#)
  - [Inquiry-Based Laboratories for Students to Investigate the Concepts of Acid–Base Titration, pKa, Equivalence Points, and Molar Absorption Coefficients](#)
  - [Encouraging Student Engagement by Using a POGIL Framework for a Gas-Phase IR Physical Chemistry Laboratory Experiment](#)
  - [The Hydrogen Atom Spectrum: Experimental Analysis Using Iterative Model Building](#)
- [Journal of Chemical Education | Vol 99, No 11](#)
  - [Newly Designed Laboratory Course for Preservice Chemistry Teachers: Do the Students Rate Their Practical Skills As Relevant for Their Future Profession?](#)
  - [Introducing the Role of Metals in Biology to High School Students](#)
  - [Organic Connections: A Chemical Jigsaw Puzzle for Learning Structural Formulas](#)
- [Journal of Chemical Education | Vol 99, No 10](#)
  - [How Can Socio-scientific Issues Help Develop Critical Thinking in Chemistry Education? A Reflection on the Problem of Plastics](#)
  - [“MasterChemist”: A Novel Strategy for Reviewing Stoichiometry and Introducing Molecular Gastronomy to Chemistry Students](#)
  - [“The Masked Scientist”: Designing a Virtual Chemical Escape Room | Journal of Chemical Education](#)
  - [A Simple Chemical Oscillator: The “Educator”](#)

- A Low-Cost and Simple Demonstration of Freezing Point Depression and Colligative Properties with Common Salts and Ice Cream
- Electrochromic Device Demonstrator from Household Materials
- Using Jupyter Tools to Design an Interactive Textbook to Guide Undergraduate Research in Materials Informatics
- Journal of Chemical Education | Vol 99, No 9
  - Knowledge, Attitude, and Practice of Teachers and Laboratory Technicians toward Chemistry Laboratory Safety in Secondary Schools
  - Chemistry Teachers' Self-Efficacy Perception Scale for Teaching in Chemistry Laboratories
  - STR120: A Web-Based Board Game for Aiding Students in Review of the Structural Theory of Organic Compounds
- Journal of Chemical Education | Vol 99, No 8
  - When All You Have Is a Covalent Model of Bonding, Every Substance Is a Molecule: A Longitudinal Study of Student Enactment of Covalent and Ionic Bonding Models
  - Independent at-Home Chemistry Project for a High School Student: Osmosis Experiments Using a U-Tube Apparatus
  - Improving the Understanding of Chemistry by Using the Right Words: A Clear-Cut Strategy to Avoid Misconceptions When Talking about Elements, Atoms, and Molecules
  - Visualizing Solutions of the One-Dimensional Schrödinger Equation Using a Finite Difference Method
- Journal of Chemical Education | Vol 99, No 7
  - Inconsistent Language Use in Online Resources Explaining the Mole Has Implications for Students' Understanding
  - A Review of Research on the Teaching and Learning of Chemical Bonding
  - Microcomputer-Based Laboratory Role in Developing Students' Conceptual Understanding in Chemistry: Case of Acid-Base Titration
  - Why Is There a Red Line? A High School Experiment to Model the Role of Gold Nanoparticles in Lateral Flow Assays for COVID-19
  - Integrating Python into a Physical Chemistry Lab
  - Investigating Student Engagement in General Chemistry Active Learning Activities using the Activity Engagement Survey (AcES)
  - Thermodynamics of Wettability: A Physical Chemistry Laboratory Experiment
  - Embedded Questions and Targeted Feedback Transform Passive Educational Videos into Effective Active Learning Tools
  - Harry Potter Themed Digital Escape Room for Addressing Misconceptions in Stoichiometry
  - A Simple, Facile Demonstration of Copper and Nitric Acid Reaction
  - An Alternative to the Flame Test: Using Inexpensive Tesla Coils to Produce the Emission Spectra of Metal Salts
- Journal of Chemical Education | Vol 99, No 6
  - A Sweet Introduction to the Mathematical Analysis of Time-Resolved Spectra and Complex Kinetic Mechanisms: The Chameleon Reaction Revisited
  - The Chemical Wonders of No-Mess Markers
  - Titrating Consumer Acids to Uncover Student Understanding: A Laboratory Investigation Leading to Data-Driven Instructional Interventions
  - Development of a Microscope Stage with Light-Emitting Diodes to Upgrade a Traditional Microscope to a Fluorescence Microscope
- Journal of Chemical Education | Vol 99, No 5
  - Anesthesia as a Theme for Context-Based Learning in a Physical Chemistry Short Course (pharma ?)
  - Virtually Bridging the Safety Gap between the Lecture Hall and the Research Laboratory
  - Invention as a Complement to High School Chemistry

- Rising Atmospheric Carbon Dioxide Could Doom Ocean Corals and Shellfish: Simple Thermodynamic Calculations Show Why
- Simulation Game Illustrating the Density–Le Châtelier Effect on a Chemical Equilibrium of the Type  $A \rightleftharpoons 2B$
- An Inexpensive 3D Printed Periscope-Type Smartphone-Based Spectrophotometer for Emission, Absorption, and Fluorescence Spectrometry
- Impact of Ocean Acidification on Shelled Organisms: Supporting Integration of Chemistry and Biology Knowledge through Multidisciplinary Activities
- WERNER: A Card Game for Reinforcement Learning of Inorganic Chemistry Nomenclature
- Journal of Chemical Education | Vol 99, No 4
  - Graphical Application to Assist Students Understand the Basic Concepts in Acid–Base Titrations
  - Calculating the pH of a Strong Acid or a Strong Base Before and After Instruction in General and Analytical Chemistry
  - Exploring the Viability and Role of Virtual Laboratories in Chemistry Education Using Two Original Modules
  - Designing Virtual Laboratory Exercises Using Microsoft Forms
  - Creating Representation in Support of Chemical Reasoning to Connect Macroscopic and Submicroscopic Domains of Knowledge
- Journal of Chemical Education | Vol 99, No 3
  - Gamified Virtual Laboratory Experience for In-Person and Distance Students
  - The Case Study Method in Chemistry Teaching: A Systematic Review
  - Compounds and Molecules: Learning How to Distinguish Them through an Educational Game
  - Does Virtual Titration Experiment Meet Students' Expectation? Inside Out from Indian Context
  - Future of the Flipped Classroom in Chemistry Education: Recognizing the Value of Independent Preclass Learning and Promoting Deeper Understanding of Chemical Ways of Thinking During In-Person Instruction
- Journal of Chemical Education | Vol 99, No 2
  - Using the Recycled Parts of a Computer DVD Drive for Fabrication of a Low-Cost Arduino-Based Syringe Pump
  - New Software Application and Case Study That Simplify Teaching Complex Chemical Solubility and Equilibria
  - Mobile Augmented Reality Laboratory for Learning Acid–Base Titration
  - The Open-Response Chemistry Cognitive Assistance Tutor System: Development and Implementation
  - Implementation of Inquiry-Based Science in the Classroom and Its Repercussion on the Motivation to Learn Chemistry
  - Using the Schoolyard as a Setting for Learning Chemistry: A Sociocultural Analysis of Pre-service Teachers' Talk about Redox Chemistry
  - Assessment of Practical and Scientific Writing Skills for Pre-University Students through Project-Based Learning
  - Animated Electrochemistry Simulation Modules
  - Virtual Reality Assisted General Education of Nuclear Chemistry and Radiochemistry
  - Digital Tool for the Analysis of UV–Vis Spectra of Olive Oils and Educational Activities with High School and Undergraduate Students
  - LabPi: A Digital Measuring Station for STEM Education 4.0
  - Adsorption of Additives in Cola Beverages: A Safe and Improved Experiment Exploring Beer's Law and Adsorption Process

- [Thirst for a Solution: Alginate Biopolymer Experiments for the Middle and High School Classroom](#)
- [CHEMTrans: Playing an Interactive Board Game of Chemical Reaction Aeroplane Chess](#)
- [At-Home Microscale Paper-Based Quantitative Analysis Activity with External Standards](#)
- [Chemist Bot as a Helpful Personal Online Training Tool for the Final Chemistry Examination](#)
- [The Thalidomide Mystery: A Digital Escape Room Using Genially and WhatsApp for High School Students](#)
- [Journal of Chemical Education | Vol 99, No 1 - Special Issue on Diversity, Equity, Inclusion, and Respect in Chemistry Education Research and Practice](#)
  - [Investigating the Impact of Assessment Practices on the Performance of Students Perceived to Be at Risk of Failure in Second-Semester General Chemistry](#) Lisa Shah, Adan Fatima, Ahmad Syed, and Eric Glasser, J. Chem. Educ. 2022, 99, 1, 14–24 DOI: 10.1021/acs.jchemed.0c01463

## 2021

- [Journal of Chemical Education | Vol 98, No 12](#)
  - [Valence Bond and Molecular Orbital: Two Powerful Theories that Nicely Complement One Another](#)
  - [Exploring Variation in Ways of Thinking About and Acting to Control a Chemical Reaction](#)
  - [A Program-Level Assessment of Student Understanding of Bonding in the Chemistry Major](#)
  - [An Integrated Database of Common Chemicals and Chemistry Demonstrations and Student Experiments Used in Hungary](#)
  - [Microscale Educational Kits for Learning Chemistry at Home](#)
  - [Using NCBI Entrez Direct \(EDirect\) for Small Molecule Chemical Information Searching in a Unix Terminal](#)
  - [How Many Bubbles Are in the Foam Produced during the Candy-Cola Soda Geyser?](#)
  - [Finding the pKa Values of a Double-Range Indicator Thymol Blue in a Remote Learning Activity](#)
  - [Should We Ban Single-Use Plastics? A Role-Playing Game to Argue and Make Decisions in a Grade-8 School Chemistry Class](#)
  - [Using Sodium Hydrogen Carbonate to Teach Chemical Concepts of Thermodynamics](#)
  - [Examining the Aufbau Principle and Ionization Energies: A Computational Chemistry Exercise for the Introductory Level](#)
  - [Computer Vision in Chemistry: Automatic Titration](#)
  - [Another Useful Film Clip: Scientific Methodology of the Frankenstein Monster](#)
- [Journal of Chemical Education | Vol 98, No 11](#)
  - [Pedagogical Reform in an Introductory Chemistry Course and the Importance of Curricular Alignment \(undergraduate\)](#)
  - [Exemplar Case Studies Demonstrating Why Future Pharmacists Need to Learn Medicinal and Analytical Chemistry \(pharma\)](#)
- [Journal of Chemical Education - Vol 98, No 10](#)
  - [What Role May Intuitive Concepts about Chemical Ideas Play When Students Take Timed Tests?](#)
  - [Game-Based Learning and Just-in-Time Teaching to Address Misconceptions and Improve Safety and Learning in Laboratory Activities](#)
  - [Using a Modular Approach to Introduce Python Coding to Support Existing Course Learning Outcomes in a Lower Division Analytical Chemistry Course](#)
  - [Implementation of a Python Program to Simulate Sampling](#)

- Diffusion of Gases into Air: A Simple Small-Scale Laboratory Activity
- Using an Infrared Camera to Visualize a Simple Demonstration of Changing the Internal Energy of a System
- Journal of Chemical Education - Vol 98, No 9
  - Exploring Sustainability Metrics in General Chemistry Using Intensive and Extensive Properties of Matter
  - Encouraging Biochemistry Students' Metacognition: Reflecting on How Another Student Might Not Carefully Reflect
  - Investigating How Teachers' Formative Assessment Practices Change Across a Year
  - Teaching Chemistry by a Creative Approach: Adapting a Teachers' Course for Active Remote Learning
  - A Gentle Introduction to Machine Learning for Chemists: An Undergraduate Workshop Using Python Notebooks for Visualization, Data Processing, Analysis, and Modeling
  - SIR (Susceptible-Infectious-Removed) Model of Epidemiology as an Extended Example for Chemical Kinetics Students
  - An Interdisciplinary-Complementary Chemical Approach to Effective Evaluation in Undergraduate Laboratory Experiments
  - Library of 3D Visual Teaching Tools for the Chemistry Classroom Accessible via Sketchfab and Viewable in Augmented Reality
- Journal of Chemical Education - Vol 98, No 8
  - LAB Theory, HLAB Pedagogy, and Review of Laboratory Learning in Chemistry during the COVID-19 Pandemic
  - Electronic Entropy as a Periodic Property of the Elements: A Theoretical Chemistry Approach
  - An Inexpensive 3D-Printable Do-It-Yourself Visible Spectrophotometer for Online, Hybrid, and Classroom-Based Learning
  - At-Home Titration: Magnesium Hydroxide in Milk of Magnesia Using an Inexpensive Digital Balance and Natural Food Dye as Indicators
  - Glowing-in-the-Screen: Teaching Fluorescence with a Homemade Accessible Setup
- Journal of Chemical Education - Vol 98, No 7
  - Improving Learning Outcomes and Metacognitive Monitoring: Replacing Traditional Textbook Readings with Question-Embedded Videos
  - Do Social Chemophobic Attitudes Influence the Opinions of Secondary School Students?
  - Assessment of Technological Setup for Teaching Real-Time and Recorded Laboratories for Online Learning: Implications for the Return to In-Person Learning
  - Conversation among Physical Chemists: Strategies and Resources for Remote Teaching and Learning Catalyzed by a Global Pandemic
  - MolecularWeb: A Web Site for Chemistry and Structural Biology Education through Interactive Augmented Reality out of the Box in Commodity Devices
  - Calculating Soft-Sphere Ionic Radii for Solid-State Arrangements from Solution Measurements
  - Introducing Undergraduates to Primary Research Literature
  - Interactive Lecture in Redox Chemistry: Analysis of the Impact of the Dissemination of University Scientific Research among High School Students
  - Educational Videogame to Learn the Periodic Table: Design Rationale and Lessons Learned
  - Escape from Quant Lab: Using Lab Skill Progression and a Final Project to Engage Students
  - Educational Escape Room: Break Dalton's Code and Escape!
  - Liquid-Liquid Demonstrations: Phase Equilibria and the Lever Rule

- Liquid-Liquid Demonstrations: Critical Opalescence
- Liquid-Liquid Demonstrations: Spinodal Decomposition
- Integrating Artificial Intelligence to Chemistry Experiment: Carbon Dioxide Fountain
- Inexpensive Alkaline Fuel Cell for Introductory Chemistry Classes
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  - Designing and 3D Printing an Improved Method of Measuring Contact Angle in the Middle School Classroom | Journal of Chemical Education
  - Polysketch Pen: Drawing from Materials Chemistry to Create Interactive Art and Sensors Using a Polyaniline Ink | Journal of Chemical Education
  - Exploring Chemical Kinetics at Home in Times of Pandemic: Following the Bleaching of Food Dye Allura Red Using a Smartphone | Journal of Chemical Education
  - Advantages and Disadvantages of Using the Answer-Until-Correct Multiple-Choice Test Format for a Class of Non-STEM Majors | Journal of Chemical Education
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  - Sample Plan for Easy, Inexpensive, Safe, and Relevant Hands-On, At-Home Wet Organic Chemistry Laboratory Activities | Journal of Chemical Education
  - "Ethics against Chemistry": Solving a Crime Using Chemistry Concepts and Storytelling in a History of Science-Based Interactive Game for Middle School Students | Journal of Chemical Education
  - Formation of a Water Ball in a Water Bottle to Learn the Chemistry of Surfactants | Journal of Chemical Education
  - Using Classic Movie Chemistry Scenes to Introduce Classroom Activities | Journal of Chemical Education
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  - From Ideas to Items: A Primer on the Development of Ordered Multiple-Choice Items for Investigating the Progression of Learning in Higher Education STEM | Journal of Chemical Education
  - Use of Simulations and Screencasts to Increase Student Understanding of Energy Concepts in Bonding | Journal of Chemical Education
  - Let Students Choose: Examining the Impact of Open Educational Resources on Performance in General Chemistry | Journal of Chemical Education
  - Introducing High School Students to the Avogadro Number and the Mole Concept Using Discovery with Calculations Based on Physical Properties of Elements, Crystal Structures, and 28Si Spheres | Journal of Chemical Education

- [Connecting Chemistry to Mathematics by Establishing the Relationship between Conductivity and Concentration in an Interdisciplinary, Computer-Based Project for High School Chemistry Students | Journal of Chemical Education](#)
- [From Passive Observers to Active Participants: Using Interactive Remote Demonstrations to Increase Student Involvement in Online Chemistry Instruction | Journal of Chemical Education](#)
- [Using Pop-Culture to Engage Students in the Classroom | Journal of Chemical Education](#)
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- [Titrate over the Internet: An Open-Source Remote-Control Titration Unit for All Students | Journal of Chemical Education](#)
- [Journal of Chemical Education - Vol 98, No 2](#)
  - [Dimensions of Variation in Chemistry Instructors' Approaches to the Evaluation and Grading of Student Responses](#)
  - [Epistemological Profile of Chemical Bonding: Evaluation of Knowledge Construction in High School](#)
  - [Using Games to Build and Improve 10th Grade Students' Understanding of the Concept of Chemical Bonding and the Representation of Molecules](#)
  - [What Is in a Prerequisite? An Observational Study on the Effect of General Chemistry on Organic Chemistry Performance](#)
  - [Teaching Cheminformatics through a Collaborative Intercollegiate Online Chemistry Course \(OLCC\)](#)
  - [Determining University Students' Familiarity and Understanding of Laboratory Safety Knowledge—A Case Study](#)
  - [Modular Science Kit as a support platform for STEM learning in primary and secondary school](#)
  - [Exploring Chemistry with Wireless, PC-Less Portable Virtual Reality Laboratories](#)
  - [CheMakers: Playing a Collaborative Board Game to Understand Organic Chemistry](#)
  - [ChemistDice: A Game for Organic Functional Groups](#)
  - [Introducing Students to the Periodic Table Using a Descriptive Approach of Superheroes, Meats, and Fruits and Nuts](#)
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  - [Building a Raspberry Pi Spectrophotometer for Undergraduate Chemistry Classes](#)
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  - [360° Virtual Laboratory Tour with Embedded Skills Videos](#)
  - [Clarity on Cronbach's Alpha Use](#)
  - [A Creative Commons Textbook for Teaching Scientific Computing to Chemistry Students with Python and Jupyter Notebooks](#)
  - [Resuscitating the Mercury Beating Heart: An Improvement on the Classic Demo](#)
- [Journal of Chemical Education | Vol 98, No 1 - Special Issue on Chemical Safety Education: Methods, Culture, and Green Chemistry](#)

- [Safety Moments in Chemical Safety Education | Journal of Chemical Education](#)
- [RAMP: A Safety Tool for Chemists and Chemistry Students | Journal of Chemical Education](#)
- [Building Strong Cultures with Chemical Safety Education | Journal of Chemical Education](#)
- [An Engaging and Fun Breakout Activity for Educators and Students about Laboratory Safety | Journal of Chemical Education](#)
- [Reinterpreting Popular Demonstrations for Use in a Laboratory Safety Session That Engages Students in Observation, Prediction, Record Keeping, and Problem Solving | Journal of Chemical Education](#)
- [Open Digital Educational Resources for Self-Training Chemistry Lab Safety Rules | Journal of Chemical Education](#)
- [Using Virtual Reality to Demonstrate Glove Hygiene in Introductory Chemistry Laboratories | Journal of Chemical Education](#)
- [Developing Risk Assessment Competencies in Preservice K-12 Teachers | Journal of Chemical Education](#)
- [Safe Handling of Gas Generating Experiments Using Disposable Plastic Syringes | Journal of Chemical Education](#)

## 2020

- [Journal of Chemical Education | Vol 97, No 12](#)
  - [Will 2020 Be an Inflection Point in the Trajectory of Chemistry Teaching and Learning? | Journal of Chemical Education](#)
  - [Examining the Psychometric Properties of the Redox Concept Inventory: A Rasch Approach | Journal of Chemical Education](#)
  - [Analyzing Chemistry Teachers' Formative Assessment Practices Using Formative Assessment Portfolio Chapters](#) Timothy N. Abell and Hannah Sevan, *J. Chem. Educ.* 2020, 97, 12, 4255–4267 DOI: 10.1021/acs.jchemed.0c00361
    - cf. [Are you making the most of formative assessment?](#) David Read, *education in chemistry*, RSC, 2021
  - [Teaching an Introductory Organic Chemistry Class for High School Students | Journal of Chemical Education](#)
  - [Derivation of the Theoretical Minimum Energy of Separation of Desalination Processes | Journal of Chemical Education](#)
  - [Fun with Flags and Chemistry | Journal of Chemical Education](#)
  - [Race to the Reactor and Other Chemistry Games: Game-Based and Experiential Learning Experiences in Materials and Polymer Chemistry | Journal of Chemical Education](#)
  - [A Photographic Process Using Easily Available Reagents | Journal of Chemical Education](#)
  - [How Should Apples Be Prepared for a Fruit Salad? A Guided Inquiry Physical Chemistry Experiment | Journal of Chemical Education](#)
  - [Structural Chemistry 2.0: Combining Augmented Reality and 3D Online Models | Journal of Chemical Education](#)
  - [Social Distancing During the COVID-19 Pandemic: An Analogy to Explain Collision Cross-Sections in Chemical Kinetics | Journal of Chemical Education](#)
- [Journal of Chemical Education - Vol 97, No 11](#)
  - [Analyzing Students' Construction of Graphical Models: How Does Reaction Rate Change Over Time?](#)
  - ["The Chemistry of Poisons": An Interdisciplinary Approach to Integrating Chemical, Toxicological, and Medicinal Principles](#)
  - [Interactions 500: Design, Implementation, and Evaluation of a Hybrid Board Game for Aiding Students in the Review of Intermolecular Forces During the COVID-19 Pandemic](#)

- [ChemEscape, Polymer Chemistry: Solving Interactive Puzzles Featuring Scaffolded Learning to Promote Student Understanding of Polymers and Structure–Property Relationships](#)
- [Using Magnet-Embedded Silicone Balls to Construct Stable Models for Close-Packed Crystal Structures](#)
- [All Roads Lead to Rome: Triple Stoichiometry with a Lithium Battery](#)
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- Commentaries
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## Articles de Chemistry Education Research and Practice

L'article [Influencing the practice of chemistry education](#) Chem. Educ. Res. Pract., 2019, DOI: 10.1039/C9RP90006C (Editorial) de Michael K. Seery propose de nombreux liens d'articles importants en CER (chemical education research) :

Sujet	Citation
Clickers in the classroom	MacArthur and Jones (2008)
Teaching chemical equilibrium	Raviolo and Garritz (2009)
Green chemistry	Andraos and Dicks (2012)
Use of dataloggers	Tortosa (2012)
Transfer of learning	Dori and Sasson (2013)
Chemical triplet (Johnstone's triangle)	Taber (2013)
Learning progressions	Sevian and Talanquer (2014)
Teaching thermodynamics	Bain et al. (2014)
Solutions/electrolytes	de Berg (2014)
Hydrogen bonding	Weinhold and Klein (2014)
Education for sustainable development	Burmeister et al. (2012) Juntunen and Aksela (2014)
Quantum chemistry	Greca and Freire (2014)
Graphical representations of orbitals	Barradas-Solas and Sánchez Gómez (2014) Clauss et al. (2014)
Chemical bonding	Dhindsa and Treagust (2014)
Implicit knowledge	Taber (2014)
Distinguishing abstraction and complexity	Blackie (2014)
Organic chemistry	Graulich (2015)
Capturing student reasoning	Sevian et al. (2015)
Flipped learning	Seery (2015)
Chemical kinetics	Bain and Towns (2016)
Learning difficulties leading to misconceptions	Tümay (2016)
Symbolic expressions in chemistry	Liu and Taber (2016)
Pre-laboratory activities	Agustian and Seery (2017)
Reasoning about structure–property relationships	Talanquer (2018)

La revue propose aussi un [accès thématique](#) :

- Celebrating our 2020 Prize and Award winners, 2020
- Learning progressions and teaching sequences in chemistry education, 2018
- Celebrating our 2018 prize and award winners, 2018
- Development of key skills and attributes in chemistry, 2017
- The language and the teaching and learning of chemistry, 2016
- Celebrating the 2016 RSC Prize and Award Winners, 2016
- Teaching And Learning About The Interface Between Chemistry And Biology, 2015
- Physical Chemistry Education, 2014
- The Application of Technology to Enhance Chemistry Education, 2013
- Sustainable Development and Green Chemistry in Chemistry Education, 2012
- Diagnostic Assessment in Chemistry, 2011
- Evidentially-Based Curriculum Development, 2010
- Chemistry Teacher Education – Recent Developments, 2009
- Research and Practice in Chemical Education in Advanced Courses, 2008
- The Laboratory in Science Education: The State of the Art, 2007

- Chemical Education Research in Glasgow in Perspective, 2006
- Chemistry and Environmental Education, 2004
- Teaching Chemistry and Physics, 2003
- Structural Concepts, Part II, 2002
- Structural Concepts: Contributions from Science, Science Education, History and Philosophy of Science, 2001

## Advance articles

- ...

## 2024

- [Volume 25, 01 January 2024, Issue 1, Page 1 to 374](#)
  - [Exploring senior high-school students' understanding of electrochemical concepts: patterns of thinking across Turkish and Indonesian contexts - Chemistry Education Research and Practice \(RSC Publishing\)](#)
  - [Effects of formative assessment with technology on students' meaningful learning in chemistry equilibrium concepts - Chemistry Education Research and Practice \(RSC Publishing\)](#)

## 2023

- [Volume 24, 01 October 2023, Issue 4, Page 1101 to 1275](#)
  - [The use of frameworks in chemistry education research](#)
  - [Pre-service chemistry teachers' understanding of knowledge related to climate change](#)
  - ["I guess it was more than just my general knowledge of chemistry": exploring students' confidence judgments in two-tiered assessments](#)
- [Volume 24, 01 July 2023, Issue 3, Page 785 to 1099](#)
  - [Learning to teach chemical bonding: a framework for preservice teacher educators - Chemistry Education Research and Practice \(RSC Publishing\)](#)
  - [Enhancing academic performance and student success through learning analytics-based personalised feedback emails in first-year chemistry - Chemistry Education Research and Practice \(RSC Publishing\)](#)
  - [Impacts of the flipped classroom on student performance and problem solving skills in secondary school chemistry courses - Chemistry Education Research and Practice \(RSC Publishing\)](#)
- [Volume 24, 01 April 2023, Issue 2, Page 385 to 784](#)
  - [The efficacy of instruction in application of mole ratios and submicro- and macro-scopic equivalent forms of the mole within the unit factor method](#)
  - [Revealing the development of interaction among components of pedagogical content knowledge in teaching chemical equilibrium](#)
  - [Students' interactive engagement, academic achievement and self concept in chemistry: an evaluation of cooperative learning pedagogy](#)
  - [Could competence-based chemistry teaching in secondary school harm students' performance in upper traditional exams?](#)
- [Volume 24, 01 January 2023, Issue 1, Page 1 to 383](#)

- Guided inquiry-based learning in secondary-school chemistry classes: a case study - Chemistry Education Research and Practice (RSC Publishing)
- Understanding covalent bonding – a scan across the Croatian education system - Chemistry Education Research and Practice (RSC Publishing)
- Inoculating students against science-based manipulation strategies in social media: debunking the concept of 'water with conductivity extract' - Chemistry Education Research and Practice (RSC Publishing)
- Pre-service chemistry teachers' knowledge of the coordination number and the oxidation number in coordination compounds - Chemistry Education Research and Practice (RSC Publishing)
- Secondary chemistry teacher learning: precursors for and mechanisms of pedagogical conceptual change - Chemistry Education Research and Practice (RSC Publishing)
- Developing green chemistry educational principles by exploring the pedagogical content knowledge of secondary and pre-secondary school teachers - Chemistry Education Research and Practice (RSC Publishing)
- Looking for solutions: students' use of infrared cameras in calorimetry labs - Chemistry Education Research and Practice (RSC Publishing)

## 2022

- Volume 23, 01 July 2022, Issue 3, Page 509 to 757
  - Development of pre-service chemistry teachers' pedagogical content knowledge through mentoring
  - ChemSims: using simulations and screencasts to help students develop particle-level understanding of equilibrium in an online environment before and during COVID
  - Relevance and equity: should stoichiometry be the foundation of introductory chemistry courses?
- Volume 23, 01 April 2022, Issue 2, Page 277 to 507
  - Pedagogical chemistry sensemaking: a novel conceptual framework to facilitate pedagogical sensemaking in model-based lesson planning
  - How do we know when students are learning? Shining a light on chemistry education practitioner research articles
  - VR in chemistry, a review of scientific research on advanced atomic/molecular visualization
  - Development of the Water Instrument: a comprehensive measure of students' knowledge of fundamental concepts in general chemistry
  - Student teachers' problem-based investigations of chemical phenomena in the nearby outdoor environment
  - Benefits of desirable difficulties: comparing the influence of mixed practice to that of categorized sets of questions on students' problem-solving performance in chemistry
  - Problem solving in chemistry supported by metacognitive scaffolding: teaching associates' perspectives and practices
- Volume 23, 01 January 2022, Issue 1, Page 1 to 275
  - Development of a framework to capture abstraction in physical chemistry problem solving
  - Pre-service chemistry teachers' use of pedagogical transformation competence to develop topic-specific pedagogical content knowledge for planning to teach acid-base equilibrium
  - The conceptual profile of equilibrium and its contributions to the teaching of chemical equilibrium

## 2021

- [Volume 22, 01 October 2021, Issue 4, Page 803 to 1092](#)
  - [Considerations of sample size in chemistry education research: numbers do count but context matters more!](#)
  - [Discipline-specific cognitive factors that influence grade 9 students' performance in chemistry](#)
  - [Incorporating concept development activities into a flipped classroom structure: using PhET simulations to put a twist on the flip](#)
  - [Examining learning of atomic level ideas about precipitation reactions with a resources framework](#)
  - [Student perspectives on chemistry intelligence and their implications for measuring chemistry-specific mindset](#)
  - [The impact of representations of chemical bonding on students' predictions of chemical properties](#)
  - [Teaching of experimental design skills: results from a longitudinal study](#)
  - [Preservice teachers' enactment of formative assessment using rubrics in the inquiry-based chemistry laboratory](#)
- [Volume 22, 01 July 2021, Issue 3, Page 555 to 801](#)
  - [Writing a review article: what to do with my literature review](#)
  - [Student success and the high school-university transition: 100 years of chemistry education research](#)
  - [The role of visuospatial thinking in students' predictions of molecular geometry](#)
  - [Effects of a context-based approach with prediction-observation-explanation on conceptual understanding of the states of matter, heat and temperature\)](#)
  - [Creating and testing an activity with interdisciplinary connections: entropy to osmosis](#)
  - [Chemistry instructors' intentions toward developing, teaching, and assessing student representational competence skills - Chemistry Education Research and Practice \(RSC Publishing\)](#)
  - [Effects of different ways of using visualizations on high school students' electrochemistry conceptual understanding and motivation towards chemistry learning - Chemistry Education Research and Practice \(RSC Publishing\)](#)
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  - [The topic-specific nature of experienced chemistry teachers' pedagogical content knowledge in the topics of interactions between chemical species and states of matter - Chemistry Education Research and Practice \(RSC Publishing\)](#)
  - [Student-generated PowerPoint animations: a study of student teachers' conceptions of molecular motions through their expressed models - Chemistry Education Research and Practice \(RSC Publishing\)](#)
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  - Implementation of self-regulatory instruction to promote students' achievement and learning strategies in the high school chemistry classroom - Chemistry Education Research and Practice (RSC Publishing)
  - The role of motivation on secondary school students' causal attributions to choose or abandon chemistry - Chemistry Education Research and Practice (RSC Publishing)
  - Does the way charges and transferred electrons are depicted in an oxidation-reduction animation affect students' explanations? - Chemistry Education Research and Practice (RSC Publishing)
  - I realized what I was doing was not working: the influence of explicit teaching of metacognition on students' study strategies in a general chemistry I course - Chemistry Education Research and Practice (RSC Publishing)
  - The persistence of primary school students' initial ideas about acids and bases in the mental models of adults - Chemistry Education Research and Practice (RSC Publishing)
  - Improving students' summative knowledge of introductory chemistry through the forward testing effect: examining the role of retrieval practice quizzing - Chemistry Education Research and Practice (RSC Publishing)
  - Investigating first-year undergraduate chemistry students' reasoning with reaction coordinate diagrams when choosing among particulate-level reaction mechanisms Molly B. Atkinson, Michael Croisant and Stacey Lowery Bretz, Chem. Educ. Res. Pract., 2021
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  - Pre-service chemistry teachers' pedagogical content knowledge for integrated STEM development with LESMeR model - Chemistry Education Research and Practice (RSC Publishing)
  - Linking the submicroscopic and symbolic level in physical chemistry: how voluntary simulation-based learning activities foster first-year university students' conceptual understanding - Chemistry Education Research and Practice (RSC Publishing)
  - Examining the effect of lab instructions on students' critical thinking during a chemical inquiry practical - Chemistry Education Research and Practice (RSC Publishing)
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  - Video-based instruction on safety rules in the chemistry laboratory: its effect on student achievement - Chemistry Education Research and Practice (RSC Publishing)
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- Increasing chemistry students' knowledge, confidence, and conceptual understanding of pH using a collaborative computer pH simulation - Chemistry Education Research and Practice (RSC Publishing)
- Development of a measurement instrument to assess students' proficiency levels regarding galvanic cells - Chemistry Education Research and Practice (RSC Publishing)
- Volume 21, Issue 1 page 1 to 482
  - Revisiting the use of concept maps in a large enrollment general chemistry course: implementation and assessment
  - Impact of basic arithmetic skills on success in first-semester general chemistry
  - An examination of pre-service chemistry teachers' meaningful understanding and learning difficulties about aromatic compounds using a systemic assessment questions diagram
  - Developing a lesson plan on conventional and green pesticides in chemistry education – a project of participatory action research
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  - Secondary school students' chemistry self-concepts: gender and culture, and the impact of chemistry self-concept on learning behaviour
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  - Multiple representations in the development of students' cognitive structures about the saponification reaction Mónica Baptista, Iva Martins, Teresa Conceição and Pedro Reis, Chem. Educ. Res. Pract., 2019,20, 760-771 DOI: 10.1039/C9RP00018F

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  - [Analysis of text difficulty in lower-secondary chemistry textbooks](#) Martin Rusek and Karel Vojíš, Chem. Educ. Res. Pract., 2019,20, 85-94 DOI: 10.1039/C8RP00141C
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- [A phenomenographic study of 10th grade students' understanding of electrolytes](#) Shanshan Lu, Hualin Bi and Xiufeng Liu, Chem. Educ. Res. Pract., 2019,20, 204-212 DOI: 10.1039/C8RP00125A
- [The effects of microcomputer-based laboratories on students macro, micro, and symbolic representations when learning about net ionic reactions](#) Jianqiang Ye, Shanshan Lu and Hualin Bi, Chem. Educ. Res. Pract., 2019,20, 288-301 DOI: 10.1039/C8RP00165K
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d'apprentissage :

- Analyse de l'activité étudiante lors de séances de laboratoire de chimie: vers une compréhension des raisonnements adoptés lors de l'écriture de résultats expérimentaux et de l'acquisition des techniques de dilution et de titrage colorimétrique. Thèse de Céline Picron, UNamur, 10 sept. 2020. Promoteur : Ph. SNAUWAERT [lien direct](#)
- Analyse et développement des méthodes et pratiques d'enseignement liées à l'éducation à l'environnement et à la gestion des déchets pour les enseignants des lycées et collèges dans le domaine de la chimie au Burkina Faso. Thèse présentée par Issa ZONGO en vue de l'obtention du grade académique de docteur en sciences (ULB) et en sciences/Didactique des sciences (Université Norbert ZONGO UNZ - Burkina Faso) - Année académique 2021-2022 (défense publique le 10 octobre 2022, promoteurs : Prof. Cécile Moucheron, ULB, et Dr Moussa BOUGOUMA, UNZ)
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