

## Yeonjoo Ko, Ph.D.

Lecturer, Department of Science Education  
 Postdoctoral Researcher, Research Center for Hazard Literacy Education  
 Ewha Womans University, Seoul, Korea

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### EDUCATION

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<b>Ph.D.</b> in Science Education Ewha Womans University (EWhA), Seoul, South Korea	2013 – 2017
<b>M.Ed.</b> in Learning, Design, and Technology Department of Career and Information Studies The University of Georgia at Athens (UGA), GA, USA	2017 – 2019
<b>B.S.</b> in Physics Education (Graduated first class honor) Dual majors: General Science Education Ewha Womans University, Seoul, South Korea	2009 – 2013

### ACADEMIC APPOINTMENTS

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<b>Postdoctoral Fellow</b> , Research Center for Hazard Literacy Education Korean National Research Foundation funded project titled “Development, implementation, and evaluation of effectiveness of socioscientific issues for participatory citizens program” (PI: Hyunju Lee)	2021 – Present
<ul style="list-style-type: none"> <li>• Role: Developed and validated a scale to measure social responsibility of scientists and engineers; implemented ENACT program on preservice science teachers; provided professional development workshops for secondary teachers; managed weekly meetings and mentoring program etc.</li> </ul>	
<b>Lecturer</b> , Department of Science Education, EWhA	2019 – Present
<ul style="list-style-type: none"> <li>• 35549 General Science Curricular Materials &amp; Teaching Methods</li> <li>• 35548 Theoretical Foundation of Teaching Integrated Science</li> <li>• 35621 Theory and Practice in Teaching Science at Secondary School</li> <li>• 35508 Method of Teaching Science at Secondary School</li> </ul>	

### AREA OF INTEREST

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Science education, socio-scientific issues, argumentation, integrated STEM education, artificial intelligence-based education, social responsibility of scientists and engineers, visual representation

## RESEARCH EXPERIENCE

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**Research Fellow**, Chuncheon National University of Education 2020 – present

*The role of visual representation in scientific reasoning*

- Funder: Korea National Research Foundation (PI: Hyegyeong Yoon)
- Role: Investigated preservice science teachers' use of visual representation in Physics teaching; developed virtual reality (VR) based science lesson plans

**Research Fellow**, Department of Science Education, EWha 2019 – 2021

*Artificial Intelligence-based STEAM education*

- Funder: Korea Foundation for the Advancement of Science and Creativity (PI: Hyojung Kim)
- Role: Supported science and arts teachers with AI-based STEAM education; evaluated the effectiveness of the program

*Teacher competency for integrated education*

- Funder: Korea Foundation for the Advancement of Science and Creativity (PI: Jae Young Chung)

**Graduate Researcher**, The Research and Innovation Learning (RAIL), UGA 2017 – 2019

*Developing a competence-based career coaching system for health professions*

- Funder: National Institute of Health (NIH) (PIs: Ikseon Choi & Linda McCauley)
- Role: Identified types of clinical research coordinators using cluster analysis of survey data; Literature review on competency-based education and core competencies for clinical research professionals; Assisted with the creation of the digital prototypes of the system for career navigation

*SAVE4Youth: A Scenario-based Authentic Virtual Environment (SAVE) for child pedestrian safety education* (PI: Ikseon Choi)

- Role: Designed prototypes of Virtual Reality (VR) child pedestrian safety education program; Implemented the VR program to elementary school students

**Research Assistant**, Department of Career and Information Studies, UGA 2017 – 2018

- Funder: UGA – Augusta Medical Partnership Project (PI: Janette Hill)
- Role: Identified main themes of first/second/third-year medical school students' perceptions of newly developed curriculum; Longitudinal data analysis of medical school students' recognition on small group-based curriculum

**Research Assistant**, Department of Science Education, EWha

*Drawing students' ideas of science in Australian and Korean schools* 2016 – 2017

- Funder: Australian and Korean Foundation Grant (PI: Mihye Won, Curtin University)
- Role: Observed science classroom which has a video-conferencing between classes in Australia and Korea and collected student data

including scientific drawings and explanations; Explored differences in scientific models between Korean and Australian students.

1) *Design and implementation of instructional strategies for collective Intelligence-based reasoning on socioscientific issues* 2013 – 2017

2) *Conceptualization of a PCK framework for teaching SSIs and exploration of the dynamic mechanism and its progression among PCK components*

- Funder: Korea National Research Foundation (PI: Hyunju Lee)
- Role: Designed and implemented instructional strategies for SSI instruction focusing on learning strategies; Examined interactions among elements of SSI-PCK (Socio-Scientific Issues Pedagogical Content Knowledge) framework

*Establishment of Education System of Enhancing Scientific Literacy for 21st Century* 2013

- Funder: KNRF World Class University (PI: Kyunghee Choi)
- Role: Co-author of the book series A scientific story for global citizen for 21st century; organizing staff of international seminars and workshops

Korea Education and Research Information Science (KERIS) Project 2012

- Role: Designed lesson plans and developed teaching materials using digital textbook on unit of Force and Motion for 7<sup>th</sup> grade students; developed and implemented instructional models for science digital textbook

## TEACHING EXPERIENCE

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**Lecturer**, Department of Science Education, EWha 2019 – Present  
Undergraduate courses

- 35549 General Science Curricular Materials & Teaching Methods (Overall evaluation: 5.00/5.00, 4.95/5.00, 4.85/5.00, 4.83/5.00, 4.82/5.00, 4.61/5.00)
- 35548 Theoretical Foundation of Teaching Integrated Science (Overall evaluation: 4.88/5.00, 4.84/5.00, 4.84/5.00, 4.82/5.00)

**Co-facilitator**, Department of Science Education, EWha 2021 – Present  
Extracurricular courses: Co-facilitated with Dr. Hyunju Lee

- Online faculty-led program: Learning science with culture, Winter 2021
- Solving societal problems by scientific/engineering practices, Spring 2021

**Co-Instructor**, Department of Career and Information Studies, UGA 2018  
Graduate courses: Co-designed and facilitated with Dr. Janette Hill

- EDIT 6100E Introduction to Instructional Technology: Fall 2018
- EDIT 8100 Foundations in Learning, Design, and Technology: Fall 2018

**Teaching Assistant**, Department of Science Education, EWha 2014 – 2015  
Undergraduate courses

- 21878 General Physics I: Spring and Fall 2014
- 35968 Mathematics for Science Teacher: Spring 2015

**Teaching Intern**, Department of Career and Information Studies, UGA

2018 – 2019

Undergraduate courses

- EDIT 2000 Teaching with Technology: Spring 2018, Spring 2019

## OTHER PROFESSIONAL EXPERIENCE

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**Editorial Assistant**, Journal of Research in Curriculum and Instruction (Korean) 2020 – 2021

Sponsored by Research Institute of Curriculum and Instruction

- Contacted the editorial boards, reviewers, applicants, and publishers
- Managed the JAMS online journal submission website of JRCI
- Reviewed and edited the manuscripts to be published

**Editorial Assistant**, Journal of Qualitative Inquiry (Korean) 2015 – 2016

Sponsored by The Korean Association for Qualitative Inquiry

- Contacted the editorial boards, reviewers, applicants, and publishers
- Reviewed and edited the manuscripts to be published

## REFEREED JOURNAL ARTICLES

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Kim, H., Shim, H., Lee, H., & **Ko, Y.** (under review). Factors affecting student learning outcomes in the context of science and art integrated program with artificial intelligence (AI). *International Journal of Science and Mathematics Education*. [SSCI]

**Ko, Y.**, Shim, S., & Lee, H. (2021). Development and validation of a scale to measure views of social responsibility of scientists and engineers (VSRoSE). *International Journal of Science and Mathematics Education*. Online first. doi:10.1007/s10763-021-10240-8 [SSCI]

Yoon, J., Lee, H., & **Ko, Y.** (2021). Virtual and open integration of culture for education (VOICE) with science teacher candidates from Korea during COVID-19. *Asian-Pacific Science Education*. Online first. doi:10.1163/23641177-bja10031 [SCOPUS]

Kim, G., Ok, S., Lee, H., **Ko, Y.**, Hwang, Y. (2021). A case study of an ENACT model-based engineering design course for fostering social responsibility of engineers. *Journal of Engineering Education Research*, 24(6), 3-19. [KCI]

Choi, Y., **Ko, Y.**, Hong, Y., Lee, H., & Hwang, Y. (2021). Changes of pre-service technology teachers' views and educational needs on social responsibility of science/technology/engineering through the ENACT program. *Journal of Research in Curriculum and Instruction*, 25(2), 1-13. [KCI]

Jo, S., **Ko, Y.**, & Lee, H. (2021). Patterns of student evaluation on media information regarding socioscientific issues. *Journal of the Korean Association for Science Education*, 41(1), 59-70. [KCI]

Park, S., **Ko, Y.**, & Lee, H. (2020). Video production as an instructional strategy for socioscientific issues: Its impact on middle school students' media literacy and understanding of SSI. *Journal of Research in Curriculum and Instruction*, 24(5), 511-522. [KCI]

**Ko, Y.**, & Lee, H. (2020). Analyzing college students' dialogic argumentation in the context of nanotechnology issues based on idiocentrism and allocentrism. *Journal of the Korean Chemical Society*, 64(5), 291-303. [KCI]

- Kim, G., **Ko, Y.**, & Lee, H. (2020). The effects of community-based socioscientific issues program (SSI-COMM) on promoting students' sense of place and character as citizens. *International Journal of Science and Mathematics Education*, 18, 399-418. doi:10.1007/s10763-019-09976-1 [SSCI]
- Choi, J., **Ko, Y.**, & Lee, H. (2019). Comparative analysis of socioscientific issues presented in the 2015 integrated science and social studies textbooks. *Journal of Learner-centered Curriculum and Instruction*, 19(16), 1233-1256. [KCI]
- Rojewski, J. W., Choi, I., Hill, J., **Ko, Y.**, Walters, K. L., Kwon, S. J., & McCauley, L. (2019). Career orientation and perceived professional competence among clinical research coordinators. *Journal of Clinical and Translational Science*, 3(5), 234-244. doi: 10.1017/cts.2019.385 [Impact Factor: 1.954]
- Park, D., **Ko, Y.**, & Lee, H. (2018). Flipped learning in socioscientific issues instruction: Its impact on middle school students' key competencies and character development as citizens. *Journal of the Korean Association for Science Education*, 38(4), 467-480. [KCI]
- Ko, Y.**, & Lee, H. (2017). Comparison of the effects of socioscientific issues instruction on promoting college students' character and values: Based on idiocentrism and allocentrism. *Journal of the Korean Association for Science Education*, 37(3), 395-405. [KCI]
- Kim, J., **Ko, Y.**, & Lee, H. (2017). Enhancing student key competencies through socioscientific issues instruction. *Journal of Learner-centered Curriculum and Instruction*, 17(8), 339-362. [KCI]
- Ko, Y.**, Kim, Y., Lee, H., & Lim, K. (2017). Research trends in teacher learning community in Korea: A thematic analysis of Korean journal publications. *Journal of Learner-centered Curriculum and Instruction*, 17(4), 429-457. [KCI]
- Park, S., **Ko, Y.**, & Lee, H. (2017). Use of digital storytelling approaches to enhance the educational effects of SSI instructions. *Journal of the Korean Association for Science Education*, 37(1), 181-192. [KCI]
- Kim, J., **Ko, Y.**, & Lee, H. (2016). Effects of socioscientific issues instruction on elementary school students' character and values as global citizens. *The Journal of Elementary Education*, 29(3), 1-25. [KCI]
- Ko, Y.**, Choi, Y., & Lee, H. (2015). Development of an analytical framework for dialogic argumentation in the context of socioscientific issues: Based on discourse clusters and schemes. *Journal of the Korean Association for Science Education*, 35(3), 509-521. [KCI]
- Ko, Y.**, Lee, H., & Kim, S.-W. (2015). Gender differences of physics major college students' conceptual understanding and its degree of certainty in the subject of quantum mechanics. *New Physics: Sae Mulli*, 65(8), 812-824. [SCOPUS, KCI]
- Lee, H., Choi, Y., & **Ko, Y.** (2015). Effects of collective intelligence-based SSI instruction on promoting middle school students' key competencies as citizens. *Journal of the Korean Association for Science Education*, 35(3), 431-442. [KCI]
- Ko, Y.**, & Lee, H. (2014). Pre-service science teachers' understanding of students' misconceptions in physics and perceptions on "teacher as a researcher" through the research experience. *Journal of the Korean Association for Science Education*, 34(5), 449-457. [KCI]

Lee, H., Choi, Y., & **Ko, Y.** (2014). Designing collective intelligence-based instructional models for teaching socioscientific issues. *Journal of the Korean Association for Science Education*, 34(6), 523-534. [KCI]

## MANUSCRIPTS IN PREPARATION

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**Ko, Y.**, & Yoon, H. (in writing). Pre-service teacher's use of visual representations in their Physics teaching.

Lee, H., & **Ko, Y.** (in writing). ENACT project: Promoting pre-service science teachers' perception on social responsibility of scientists and engineers

Hwang, Y., **Ko, Y.**, & Lee, H. (in writing). Promoting social responsibility of engineering college students through ENACT project.

**Ko, Y.**, Kim, H., Shim, H., & Lee, H. (in writing). The impact of artificial intelligence-based STEAM education on student attitudes towards AI.

## CONFERENCE PRESENTATIONS

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**Ko, Y.**, Shim, S., & Lee, H. (2021, July). *Development of a scale to measure views of social responsibility and analysis of STEM college students' views on social responsibility*. Panel presentation, The 80th KASE Academic Conference, online conference.

Hwang, Y., **Ko, Y.**, & Lee, H. (2021, July). *ENACT project for STEM college majors: Its design and cases*. Panel presentation, The 80th KASE Academic Conference, online conference.

Hwang, Y., Choi, Y., Ok, S., Nam, C.-H., **Ko, Y.**, Lee, H., Lee, K., & Hong, J. (2021, July). *Effects of ENACT-based program on college students' social responsibility of scientists and engineers*. Panel presentation, The 80th KASE Academic Conference, online conference.

**Ko, Y.**, & Yoon, H. (2021, June). *Characteristics of interaction using visual representation in pre-service teachers' physics teaching*. Oral presentation, International Science Education Conference (ISEC) 2021, Singapore, online conference.

**Ko, Y.**, Shim, S., & Lee, H. (2021, February). *Development and validation of a scale of social responsibility for scientists and engineers*. Oral presentation, International Organization for Science and Technology Education (IOSTE) 2020, online conference.

**Ko, Y.** (2021, January). *Discussion on teacher perceptions and practices in inclusive science education*. General Discussion, Korean Association for Science Education 2021, online conference.

**Ko, Y.** (2020, November). *Korean K-12 Education during COVID19 pandemic period*. Online invited speech for EDIT 2000 course, The University of Georgia.

**Ko, Y.**, Shim, S., & Lee, H. (2020, September). *Development and validation of questionnaire to measure social responsibility of STEM professionals*. Symposium presentation, 2020 Korean Society for Engineering Education, Jeju, Korea.

Choi, I., Kwon, S., Walters, K., & **Ko, Y.** (2019, October). *A scenario-based authentic virtual*

*environment (SAVE) for child pedestrian safety education: Its design and learning benefits. [Outstanding Practice Award sponsored by the Design & Development Division]*, Paper accepted for **Featured Research Session** at the annual conference of the Association for Educational Communications and Technology, Las Vegas, NV.

- Hill, J., Walters, K., Ko, Y., Kwon, S., Rojewski, J., Fisher, E., Choi, I., & McCauley, L. (2019, June). *Who are these people? Using progressive personas to guide STELLAR development*. Round table, EdMedia + Innovate Learning 2019, Amsterdam, Netherlands.
- Ko, Y. (2019, May). *"Poco a poco": Autoethnographic writing on a journey to become a lifelong music learner*. Panel presentation, The 15th International Congress of Qualitative Inquiry, The University of Illinois at Urbana-Champaign, IL.
- Choi, I., Kwon, S., Walters, K., Ko, Y., Hill, J., Rojewski, J., & McCauley, L. (2019, February). *Conceptual framework of the self-directed training, education, life-long learning advancement resource system*. Poster presentation, The 2<sup>nd</sup> Annual Georgia Clinical & Translational Science Conference, Pine Mountain, GA.
- Hill, J., Walters, K., Ko, Y., Kwon, S., Rojewski, J., Fisher, E., Choi, I., & McCauley, L. (2019, February). *Who are these people? Creating personas to guide STELLAR development*. Poster presentation, The 2<sup>nd</sup> Annual Georgia Clinical & Translational Science Conference, Pine Mountain, GA.
- Rojewski, J., Ko, Y., Kwon, S., Walters, K., Hill, J., Fisher, E., Choi, I., & McCauley, L. (2019, February). *Typology of clinical research coordinators using career orientations and perceived professional competence*. Poster presentation, The 2<sup>nd</sup> Annual Georgia Clinical & Translational Science Conference, Pine Mountain, GA.
- Kwon, S., Walters, K., Ko, Y., Melendez, L., Wilson, C., Yang, T., Cho, R., Han, K., Chung, C., Kim, D., Song, S., & Choi, I. (2018, October). *A scenario-based virtual reality (VR) learning environment for child pedestrian safety education. [Outstanding Award in Design and Development Division]*, Design and Development Showcase, The annual Association for Educational Communications and Technology conference, Kansas City, MO.
- Ko, Y., & Lee, H. (2018, October). *Character development of college students through socio-scientific issues instruction*. Paper presented at the annual Association for Educational Communications and Technology conference, Kansas City, MO.
- Mun, K., Hwang, Y., Ha, M., Ko, Y., & Kwon, S. (2018, July). *Exploring the motivation for science learning of engineering majors*. Poster presentation, The 74th KASE Academic Conference, Daegu National University of Education, Daegu, Korea.
- Ko, Y., Kim, G., & Lee, H. (2018, July). *Community-based socio-scientific issues instruction: Relationship between sense of place and character development*. Paper presented at the 2018 International Korean Association for Learner-centered Curriculum and Instruction Conference, Ewha Womans University, Seoul, Korea.
- Walters, K., Kwon, S., Ko, Y., Melendez, L., Wilson, C., Yang, T., Cho, R., Han, K., Chung, C., Kim, D., Song, S., & Choi, I. (2018, April). *SAVE4Youth: Scenario-based virtual reality (VR) learning environment for child pedestrian safety education*. Poster Presentation, IRIS 2018: Integrative Research and Ideas Symposium, Athens, GA.
- Ko, Y., Kim, Y., & Lim, K. (2016, July). *Research trends in teacher learning community in Korea:*

*Implications on science education.* Poster presentation, The 70th KASE Academic Conference, Chonbuk National University, Korea.

Park, D., **Ko, Y.**, Lee, H. (2016, July). *The effects of a flipped learning based SSI instruction on student key competencies.* Poster presentation, The 70th KASE Academic Conference, Chonbuk National University, Korea.

Park, S., **Ko, Y.**, Lee, H. (2016, July). *Student perceptions of the effects of SSI program using a digital storytelling approach.* Poster presentation, The 70th KASE Academic Conference, Chonbuk National University, Korea.

Kim, J., **Ko, Y.**, & Lee, H. (2016, July). *The effects of socioscientific issues instruction on elementary school students' character and values as global citizens.* Paper presented at the 70th Meeting of KASE, Chonbuk National University, Jeonju, Korea.

**Ko, Y.**, Choi, Y., & Lee, H. (2016, April). *A comparison of college students' character development and socioscientific argumentation based on their orientations: Individualism-collectivism.* Paper presented at the 89th annual meeting of NARST: Toward equity and justice: Many different voices, cultures, and languages in science education research for quality science learning and teaching, Baltimore, MD.

Mun, K., Choi, Y., Mun, J., & **Ko, Y.** (2015, October). *Methodological research trends of science education in Korea.* Paper presented at the 4th International Conference of East-Asian Association for Science Education: Promoting Science Education Reform through Research, Beijing Normal University, China.

**Ko, Y.**, Choi, Y., & Lee, H. (2015, July). *Analysis of patterns of college students' socioscientific argumentation based on their orientations.* Paper presented at the 68th Meeting of KASE, KAIST, Daejeon, Korea.

**Ko, Y.**, Lee, H., & Choi, Y. (2015, April). *Development of framework for assessing the quality of socioscientific argumentation.* Paper presented at the 88th Annual Meeting of NARST: Becoming Next Generation Science Educators in an Era of Global Science Education Reform, Chicago, IL.

Choi, Y., **Ko, Y.**, & Lee, H. (2015, April). *Enhancing Korean middle school students' 21st century skills through collective intelligence based SSI instruction.* Paper presented at the 88th Annual Meeting of NARST: Becoming Next Generation Science Educators in an Era of Global Science Education Reform, Chicago, IL.

**Ko, Y.**, & Kim, S.-W. (2015, April). *Exploring the gender difference in Korean university students' conceptual understanding and confidence on Quantum Mechanics.* Paper presented at 2015 Korean Physical Society Spring Meeting, Daejeon Convention Center, Korea.

Choi, Y., Lee, H., & **Ko, Y.** (2014, July). *Effects of collective intelligence-based SSI instruction on science gifted students' 21st century skills and the attitudes toward science and technology.* Paper presented at 2014 The 67th KASE International Conference, Chuncheon National University of Education, Korea.

**Ko, Y.**, Lee, H., & Choi, Y. (2014, July). *Designing collective intelligence-based instructional models for teaching socioscientific issues.* Poster presentation, The 67th KASE Academic Conference, Chuncheon National University of Education, Korea.



**Ko, Y.**, & Lee, H. (2014, April). *Promoting Korean pre-service science teachers' understanding of students' misconceptions in Physics through the research experience*. Paper presented at the 87th Annual Meeting of NARST: A worldwide organization for improving science teaching and learning through research, Pittsburgh, PA.

Lee, H., & **Ko, Y.** (2014, April). *Enhancing science teachers' understanding of teaching socioscientific issues through collaborative action research*. Paper presented at the 87th Annual Meeting of NARST: A worldwide organization for improving science teaching and learning through research, Pittsburgh, PA.

**Ko, Y.**, Kim, E., Lee, H., & Noh, J. (2013, July). *Development and implementation of instructional models for digital textbook-based science teaching*. Poster presentation, The 3rd International Conference of East-Asian Association for Science Education, The Hong Kong Institute of Education, China.

## HONORS AND AWARDS

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### Scholarships

Samsung Card Scholarship, Ewha Womans University	2016
International Committee Scholarship	2014 & 2015
National Association for Research in Science Teaching (NARST)	
Scholarships for New Excellent Graduate Students, EWHA	2013
Scholarships for Excellent Undergraduate Students, EWHA	2009 – 2012

### Awards

Outstanding Practice Award sponsored by the Design & Development Division	2019
Association for Educational Communications & Technology (AECT)	
Design and Development Showcase Outstanding Award	2018
Association for Educational Communications & Technology (AECT)	
Best Paper Award Nominee	2014
National Association for Research in Science Teaching (NARST)	
Best Tutor Award	2012
Tutoring General Physics I for freshmen, Ewha Womans University	

## TECHNOLOGY TOOLS AND SKILLS

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### Data Analysis Software

Statistical Data Analysis Software: SPSS, Mplus, Netminer  
Computer-Assisted Qualitative Data Analysis Software (CAQDAS): NVivo

### Other Software/Applications

Applications: Adobe Photoshop, Tableau, Microsoft Office  
Web design and development tools; Wix, Weebly, Gather.town  
Online survey tools: Qualtrics, Survey Monkey

## CERTIFICATION

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**Secondary Teaching Certificate in South Korea**

- Physics (K27672)
- General Science (K27673)

Updated: January 1, 2022