# SCIENTIFIC HABITS OF MIND VIA LOCAL SOCIOSCIENTIFIC ISSUES ANALYSIS OF PROSPECTIVE CHEMISTRY TEACHERS: EXPLANATORY STUDY OF MIXED METHODS

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## ABSTRACT

Along with the development of science and technology, it has implications for the increasingly complex problems that arise in life so that everyone must have a good Scientific Habits of Mind (SHOM). SHOM is very useful for characterizing the scientific thinking habits of scientists. If a person has a good SHOM, it can have implications for his ability to think logically and make wise decisions regarding the problems they faces. Therefore, the development of SHOM must be carried out since students participate in educational programs that they take from an early age, including chemistry learning. In this context, chemistry teachers play an essential role in facilitating students to develop SHOM through the application of Socioscientific Issue (SSI)-based chemistry learning. In fact, currently the chemistry teachers are designing learning activities conceptually without linking chemistry content with local SSI (L-SSI) around students. This is because the chemistry teacher does not familiar with the use of L-SSI as an intermediary to explore students' SHOM. Therefore, it is important to explore the SHOM of prospective chemistry teachers at various levels of education. Through the results of this study, it is hoped that it can be used as a basis for taking strategic steps in preparing professional chemistry teachers so that they can be used as evaluations of the teacher education curriculum. This activity also supports the Independent Learning - Independent Campus (MBKM) activities by providing student experience for research internships in the field of chemistry education.

This study aims to explore the SHOM of prospective chemistry teachers through the use of L-SSI. The research was designed to be carried out for 1 year applying mixed methods with an explanatory design through a cross sectional study. The data collected in this study were quantitative and qualitative data from SHOM chemistry teacher candidates. The research sample that participated in this study consisted of 374 prospective chemistry teacher students from 4 different generations, namely the 2021, 2020, 2019, and 2018 classes. The sampling technique was carried out by saturated sampling at the quantitative stage and purposive sampling at the qualitative stage. Quantitative data on SHOM for chemistry teacher candidates were collected using the SHOM L-SSI scale adopted from Wiyarsi and Calik (2019) covering 33 statement items with 13 L-SSI and 7 SHOM factors. Furthermore, the researcher collected qualitative data through the use of an open-ended questions to 20% of the total sample as support for the explanation of the results of the quantitative data obtained from the SHOM scale. The findings of both, quantitative and qualitative were then reflected and interpreted. Descriptive statistical techniques with ideal assessment categories were used to analyse the SHOM category via local SSI chemistry teacher candidates from quantitative data obtained from the L-SSI SHOM scale. Furthermore, qualitative analysis using content analysis with a combination of interpretive and inductive coding is used to analyze qualitative data obtained from interviews. Furthermore, the MANOVA test was used to analyze differences in the SHOM factor via local SSI chemistry teacher candidates based on the level of education year. The results showed that: (1) overall the SHOM category via L-SSI chemistry teacher candidates was in the good category, (2) Mistrust Argument from Authority was the lowest SHOM factor for chemistry teacher candidates, and (3) there were significant differences from SHOM via L-SSI chemistry teacher candidates based on the level of education year especially in the aspect of open-mindedness.

The main output in this study is 1 scientific article with under review status in the Journal of Turkish Science Education (indexed by Scopus Q2). The additional output in the form of 1 article published in the AIP Conference Proceeding of the results of the speakers at the ICRIEMS FMIPA UNY international seminar in July 2022. The Technological Readiness Level (TKT) achieved in this study reached level 3, namely the primary data collection stage SHOM via L-SSI of prospective chemistry teachers.

Kata Kunci: *scientific habits of mind; local socioscientific issues; explanatory mixed methods; chemistry teacher candidate*