
Newsletter

Scientific Literacy Development among Chinese Primary and Secondary Teachers: Current States and Improvement Strategies

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THIS study investigates the current state of scientific literacy development among Chinese basic education teachers with a sample of 6,569 primary and secondary teachers from 27 provincial administrative regions across China, using scientific literacy assessments, group comparisons, OLS regression, and other research methods. It also examines the factors related to teacher scientific literacy and proposes improvement strategies, aiming to provide a basis for policies for upgrading the teaching workforces and building a nation with powerful education.

Research Findings:

- Overall, senior secondary teachers in China have reached the expected standards of scientific literacy. A pattern of primary teachers < junior secondary teachers < senior secondary teachers regarding scientific literacy levels is observed. Among the four sub-indicators of science literacy, namely, scientific knowledge, scientific methodology, scientific spirit, and scientific competence, teachers generally perform relatively lower in scientific competence and scientific methodology.

- Female teachers, middle-aged and elderly teachers, teachers with lower educational qualifications, teachers teaching non-natural science subjects, rural teachers, and teachers in western China exhibit relatively lower levels of scientific literacy.

- There is no significant correlation between scientific engagement and science literacy in basic education teachers, while their attitudes towards science and interest in science can significantly and positively predict their scientific literacy.

Based on its findings, the study proposes the following recommendations: (i) Prioritize improving the levels of scientific methodology and competence among primary and junior secondary teachers. Efforts should be made to encourage interdisciplinary attempts and conversion of scientific ideas and knowledge into innovative teaching practices in non-science teachers while further strengthening professional

competence of science teachers. (ii) Optimize the structure of the primary and secondary teaching workforces. Central and local governments should advance policies to engage more young, highly educated teachers and pre-service teachers with natural science background to work in primary and secondary schools. At the same time, educational authorities and teacher education institutions should offer specialized training to those in-service teachers with science literacy development needs. (iii) Create specialized development programs to make up for the deficits in scientific literacy among teachers at rural schools and in the western regions. Through these programs, teachers in underdeveloped areas will be provided with training opportunities to improve their scientific knowledge, competence, and methods. In the meantime, it is important to deepen the digital transformation of primary and secondary schools by leveraging new technologies, such as online learning, distance learning, and AI applications, building digital platforms for teacher scientific literacy development and facilitating cross-regional exchanges among primary and secondary teachers. (iv) Foster a school culture that encourages scientific and technological innovation, enhancing pre-service and in-service teachers' understanding of and interest in science, while also learning from global experiences regarding teacher science education guidance.

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