GEOCAPABILITIES COMPETENCE OF HIGH SCHOOL GEOGRAPHY TEACHERS IN CENTRAL JAVA, INDONESIA; WHAT IS IT AND HOW DO WE ASSESS IT?

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ABSTRACT

GeoCapabilities aims to encourage the proposition of geography as a strong disciplinary knowledge and the role of teachers as the key in bringing knowledge to learners. This study aimed to determine the level of understanding of GeoCapabilities of geography teachers in high schools in Karanganyar Regency. The method used was descriptive qualitative, with 28 respondents. The type of research is qualitative with a descriptive approach. Data collection techniques include questionnaires, test questions, interviews, and documentation. Data analysis techniques using Interactive Model and Percentage. GeoCapabilities knowledge test results on each indicator obtained; 1. Geography imagination (26.16%), 2. Empathy (22.5%), 3. Integrative thinking (23.6%), 4. Spatial thinking (20.5%), 5. Exploration (29.25%). Based on the GeoCapabilities test results, the average score obtained by geography teachers is 3.6, with a maximum score achievement percentage of 46.6%. If the knowledge test score is in the range > 36% - 52%, it is included in the "low" category. The findings in this study imply that the low knowledge of GeoCapabilities of geography teachers can hinder the success of improving the quality of geography education. Therefore, to create continuity, it is necessary to measure the competence of geography teachers to evaluate the training needed in the future.

Keywords: *Teacher Competence; Geocapabilities; Geography Learning*

INTRODUCTION

The development of science and technology took place very quickly during the Industrial Revolution 4.0. This situation requires humans to work on complex frameworks of thought and skills (Sulaiman & Ismail, 2020). Four 21st century skills are indispensable in education and teaching today, including learning and innovation skills, life and career skills, information, media and technology skills and literacy skills (Partnership for 21st Century learning, 2016; Stehle & Peters-Burton, 2019). Educational institutions are beginning to emphasise teaching practices based on 21st-century skills to meet the practical

competency market. Such learning can equip students with the skills to face global challenges (Devi et al., 2020). Educational institutions such as schools are the best institutions for students to develop new skills and meet future global challenges. Integrating 21st century competencies in subject curricula has been an important issue over the last few years. The pace of change is quite fast because it is influenced by the high level of digitisation and technological advances in all aspects of life (Choo et al., 2016). This condition requires increased educator competence according to the demands of science and technology advances that occur and how to anticipate them.

These competencies require contemporary knowledge, skills and attributes to support individual learning and development (McWilliam, 2017; Xu et al., 2018). Therefore, teacher competence is essential in shaping 21st-century skills in students through a more systematic teaching process (Sulaiman & Ismail, 2020; Kai et al., 2021). There is an international consensus on the importance of developing capabilities for 21st-century learning as part of the education curriculum (Drake & Reid,

2018). The capabilities approach embodies the values and goals of education for future learners as competent citizens. Capabilities are defined as sets of "functions" that enable individuals, as autonomous agents, to acquire knowledge, skills, and perspectives that allow learners to gain better competence and be more mature in the professional world. As such, the capabilities approach offers the perspective needed to consider and evaluate what is of value in education beyond skills and competencies (Hart, 2009; Solem, 2020). The UNESCO International Commission on Education for the 21st Century, defines the four pillars of learning as: 1) Learning to know develops the knowledge and skills needed to function in the world; 2) Learning to do develops the abilities needed for successful work; 3) Learning to live together develops social skills and values; 4) Learning to be involves the development of personal spirituality, educational values, and ethical awareness (Parmigiani et al., 2022).

Capabilities in the context of education ask teachers as curriculum leaders to reflect on the role of education in equipping students with intellectual, moral, and existential capabilities for

lifelong learning (Hinchcliff 2009; Bladh, 2020; Mitchell, 2022). Education capability has the same approach to freedom as the goal of the Indonesian education curriculum, namely, the independent curriculum. The Merdeka Curriculum (previously referred to as the prototype curriculum) is a curriculum framework with intracurricular learning that is developed more flexibly, while focusing on essential material so that students can deepen concepts and character development and strengthen students' competencies. To strengthen the competency standards of graduates, the independent curriculum includes the P5 component as a project-based co-curricular activity. P5 in the Independent Curriculum aims to produce graduates who are competent and behave according to the values of Pancasila at every level of education (Kemendikbudristek, 2022). Capability brings important changes in the world of education, especially the development of a new paradigm of geography learning to answer future challenges. Capabilities-oriented geography learning is called GeoCapabilities.

GeoCapabilities is a capability-based 21st-century geography learning paradigm that emphasises acquiring

strong and deep knowledge to address more complex problems (Bustin et al., 2020). According to (Walkington et al., 2018), GeoCapabilities offers five essential components that geography educators and learners need to have, namely: 1) geographic imagination, 2) empathy or caring, 3) integrative thinking, 4) spatial thinking, 5) structured exploration of place. This GeoCapabilities approach recognises that education needs to develop external and measurable attributes of students (Haigh & Clifford, 2011; de la Vega, 2022). Therefore, the role of teachers is crucial to optimise GeoCapabilities in learning so that their students can build their competencies in the scope of learning and daily life (Su, 2014). The novelty of the GeoCapabilities approach as an endeavour in geography education is to raise the profile of engaging teachers' thinking in curriculum implementation to build bridges between educational goals and subjects, by empowering teachers as lesson leaders. It aims to encourage the proposition of geography as a strong knowledge discipline and the role of teachers as key in bringing knowledge to learners. In this study, teacher competence is a very important aspect for improving the

quality of education to create continuity, so it is necessary to measure teacher competence. A concern that affects teachers and educators in the field is how teachers teach and assess these skills (Gilbert, 2019; Kai et al., 2021). Educators know more about how to teach subjects than they know how to teach skills (Drake & Reid, 2018).

In essence, teacher professionalism, teaching skills, subject knowledge, and computer literacy as an ongoing priority are needed to implement capabilities-based learning (de Wet & Rothmann, 2022). The implementation of GeoCapabilities in geography learning in Indonesia is minimal because it is classified as a new paradigm. Therefore, the researcher tries to identify the level of understanding, the need for mastery of GeoCapabilities of teachers and their application in 21st Century skills-oriented learning.

MATERIALS AND METHODS

This type of research is qualitative research with a descriptive analysis method. The subjects in this study were teachers who were members of the Geography Subject Teachers' Conference in Karanganyar Regency.

High school sampling was carried out using a stratified random sampling technique. Collecting research data using questionnaires, test questions, interviews and documentation. The teacher competency questionnaire instrument was adopted from (Yusrizal et al., 2019; Topchyan & Woehler, 2021; Gutiérrez Martín et al., 2022) and modified by the author. The competency indicators used are adjusted to Permendiknas No 16 of 2007. The interview technique was conducted in a structured manner using interview guidelines that were prepared systematically and structured to obtain in-depth information about the implementation of capability-based geography learning (GeoCapabilities). GeoCapabilities knowledge test teachers use a set of questions in the form of HoTS, totalling 20 questions by the GeoCapabilities assessment indicators. To support the data obtained, researchers conducted documentation at each study stage. The test and questionnaire results were analysed using the percentage formula, as seen in Formula 1 (Soegiyono, 2019).

$$P = F/N \tag{1}$$

Description:

P   = Percentage of student scores

F   = Frequency of student scores

N   = Number of students

The process of processing and analysing data was carried out through four stages. The data analysis technique used as a reference in this study uses the Miles and Huberman model. According to Miles and Huberman, the Interactive Model Analysis technique consists of data collection, reduction, display, and conclusions (Syawaludin et al., 2019). To determine the calculation results, they are categorised using the Percentage of maximum score achievement (Levis, 2013) shown in **Table 1.**

Table 1. Maximum Score Achievement Percentage Category

Scale	Explanation
≥ 20% - 36%	Very Bad / Very Low
> 36% - 52%	Not Good/Low
>52% - 68%	Fairly Good/Moderately High
> 68% - 84%	Good / High
> 84% - 100%	Very Good/Very High

Sources: (Levis, 2013)

RESULTS AND DISCUSSION

1. Analysis Of GeoCapabilities Of High School Teachers In Karangnyar Regency In General

GeoCapabilities are highly dependent on acquiring and developing strong geographical knowledge and deep questions, which arise because teachers have a curriculum and pedagogical dimension. What teachers teach, and in what way they teach it, contributes significantly to the acquisition of strong geographical knowledge by students. Therefore, before knowing the level of GeoCapabilities implementation in the classroom, it is necessary to identify the level of understanding and competence of GeoCapabilities of geography teachers on each of its assessment indicators. The following are the results of identifying GeoCapabilities assessment of geography teachers in high schools in Karanganyar Regency, shown in **Table 2**.

Based on the GeoCapabilities test results above, there are several findings on each assessment indicator that can be discussed, namely:

a. Geography Imagination Dimension

Three assessment indicators are used to identify teachers' level of imagination in geography. These indicators include: 1) Knowledge as interpreted experience with a competency index of 25%. In this indicator, teachers are expected to be able to explain a concept well with

examples of direct experience that they already know. 2) Phenomena analysis: In this indicator, teachers measure the level of analysis based on geographic phenomena that have been presented, and a competency index of 32% was obtained. 3) Space representation, the competency index is 21.5%. In this indicator, teachers are measured by their ability to represent spatial characteristics and phenomena.

Table 2. Geocapabilities Assessment of Geography Teachers in Karanganyar District

Indicator	Teacher Competence Index (%)	Indicator	Teacher Competence Index (%)
Imagination Geography	26.16	Spatial Thinking	20.5
Knowledge as interpreted experience	25	Concept spatial	28
Phenomenon analysis	32	Tools of representation	21
Spaces representation	21.5	Reasoning	17.5
Empathy	22.5	Exploration	29.25
Knowledge of issues	25	Space and Place	4
Knowledge of action strategies	57	Scale and Connection	54
Locus of control	4	Proximity and distance	27
Attitudes	4	Relational Thinking	32
Integrative Thinking	23.6		
Qasuality	7		
Architecture	21		
Resolution	43		

Source: Adopted from (Bergmann & Lally, 2021), (Hines et al., 1987), (Martin & Austen, 1999), (Jo & Bednarz, 2009), (Baldacchino, 2004) and modified by the author

b. Empathy dimension

There are four assessment indicators used to identify teachers' environmental empathy. These indicators include: 1) Knowledge of issues, obtained a competency index of 25%. This indicator identifies teachers for their ability to describe environmental problems/geospheric phenomena and their causes. 2) Knowledge of action strategies, obtained a competency index of 57%. This indicator measures teacher knowledge about strategies or actions that can be taken to reduce the impact of environmental problems. 3) Locus of control. This indicator measures the level of teacher optimism for environmental actions taken, based on knowledge and experience in the field, and obtained a competency index of 4%. 4) Attitudes, on this indicator, identify attitudes and behaviours of environmental care in daily application based on the test questions presented, obtaining an

attitudes competency index in its application of 4%.

c. The integrative thinking dimension

Three assessment indicators are used to identify the level of teacher integrative thinking. These indicators include: 1) Quality, obtained a competency index of 7%. This indicator measures the teacher's competence in analysing the causal relationship of the phenomena presented by considering multi-directional and non-linear causality. 2) Architecture. This indicator assesses the visualisation ability of the teacher's spatial thinking framework, and a competency index of 7% was obtained. 3) Resolution: This indicator identifies the creative resolution teachers produce from a problem and obtains a resolution competency index of 43%.

d. In the spatial thinking dimension, three assessment indicators can be used to identify teachers' spatial thinking level. These indicators include: 1) Concept spatial, obtained a competency index of 28%. This indicator assesses the teacher's understanding of space with abstraction using geometric concepts

such as distance, coordinates, and dimensions that can build a conceptual framework. 3) Tools of representation, obtained a competency index of 21%. This indicator assesses teachers using, processing, and presenting spatial representation tools that aim to obtain spatial data. 4) Reasoning, obtained a competency index of 17.5%. This indicator identifies the level of logical thinking of teachers who can connect field facts and knowledge to obtain a conclusion or discovery from the thinking process.

e. The dimension of structured spatial exploration

There are four assessment indicators used to identify teacher spatial exploration. These indicators include: 1) Space and Place, which aims to determine the level of analytic characteristics of space and place in the area observed by individuals and obtained a competency index of 4%. 2) Scale and Connection, the competency is 54% in this indicator. This assessment is based on the teacher's competence in physically calculating the scale or extent of the area and the connectivity of the area with the surrounding or other areas.

3) Proximility and distance obtained a competency index of 27%. This assessment is based on the competence of teachers in analysing and exploring phenomena by utilising maps, remote sensing, photo imagery, Google Earth, and information from the internet. 4) Relational Thinking, obtained a competency index of 32%. This assessment is based on teacher competence in connecting knowledge and information obtained in a structured manner to solve a problem.

The data are the results of the geography teacher group test on each indicator of the GeoCapabilities assessment. The analysis results in this calculation provide an overview of each respondent's answer to the variables studied. GeoCapabilities test data from the average score of respondents in general can be described in **Table 3** below:

Table 3. Maximum - Minimum Achievement Score of Geocapabilities Assessment

Respon-dent	Question Items	Maximum Score		Earned Score		Average Score	Maximum Score Achievement %	Category
		Highest	Lowest	Highest	Lowest			
28	15	15	1	7	1	3.6	46.6	Low

Source: Research Analysis, 2024

Table 3 shows that the highest score is seven and the lowest is 1. The score obtained is within the assessment limit of each respondent's GeoCapabilities competency with the highest score expectation of 15 and the lowest score tolerance of 1. The average score obtained from respondents' answers based on the teacher GeoCapabilities competency test results is 3.6. The Percentage of achievement of the maximum score of GeoCapabilities obtained by respondents is 46.6%. The value of 46.6% is included in the "low"

category, which is in the maximum score > 36% - 52%. Therefore, it can be described that the average geography teacher in Karanganyar Regency high school has a "low" GeoCapabilities competency index for 21st-century geography-learning.

2. Identification Of Geography Teacher Qualification Towards Geocapabilities Competency

Competence is a person's basic characteristics of knowledge, skills, and

attitudes related to the occupied work. Teachers who know about learning and human behaviour know the subject area being taught; have the right attitude towards themselves, schools, peers, and the subject area being taught; have good skills in teaching techniques. The Teacher Standards are established as criteria for assessing the competencies of the education profession. The Teacher Standards have a favourable influence on the practice of teacher education. The future geography teachers' task is to train their students' competencies. Teachers must not only have spatial competencies, but they must be able to adjust to these competencies. Teacher competence is difficult to define because no fixed indicators measure teacher quality. Therefore, the authors collected several literatures that can be used to find the attributes of teacher competency assessment against GeoCapabilities. Overall, the teacher competency assessment compiled in this study is a set of basic capacities, abilities, and skills, which affect teacher essential learning. Three points form the basis for the teacher demographic profile qualification: age identification, last educational qualification, and length of teaching experience.

Table 4 shows that teachers with the highest GeoCapabilities competency achievement index are in the 41-50 year age range with a capability value of 33.3%, followed by the 31-40 year age range with a capability value of 26.63%. Mature teaching experience and a relatively productive age range are the positive aspects that affect the GeoCapabilities index. Long teaching experience determines the Number of teaching hours, technology and curriculum training experience, and material deepening. Neither are age qualifications classified as lagging behind in keeping up with ICT and geospatial technology development. Teachers who have the lowest GeoCapabilities competency achievement index are dominated by the age range 21 - 30 years, with a capability value of 21.28% and the lowest GeoCapabilities index achievement is dominated by the age range >50 years, with a capability value of 19.2%. Based on the analysis results, both age ranges have a low GeoCapabilities index of 21 - 30. However, at that age, it is classified as productive and tech-anie, but has a teaching experience that is still quite low. The age range >50 years has the lowest GeoCapabilities index among

other groups because teachers are no longer productive, lagging behind in mastering technology and learning

models, and have previous educational qualifications that are difficult to keep up with current scientific developments.

Table 4. Demographic profile of high school geography teachers in Karanganyar Regency

Qualification	Indicator	f	%	Variance	Std. dev	GeoCapabilities Competence Index (%)
Teacher age	21 – 30 yrs	5	17.86			21.28
	31 – 40 years	10	35.71	2.10	1.45	26.63
	41 – 50 years	4	14.29			33.3
	=> 50 years	9	32.14			19.2
Experience of teaching	1 – 10 years	12	42.86			23.84
	11 – 20 years	8	28.57	44.08	6.64	26.63
	=>20 years	8	28.57			22.46
Last education	bachelor of geography education / Geography	17	60.71			26.63
	Non bachelor of geography education / Geography	6	21.43	0.62	0.79	23.28
	master of geography education	5	17.86			17.3
	doctorate in geography education	0	0			0

Source: (Yusrizal et al., 2019; Topchyan & Woehler, 2021; Gutiérrez Martín et al., 2022) and modified by the author.

In the teaching experience qualification, teachers with 10 - 20 years of teaching experience obtained the highest GeoCapabilities competency index of 26.63%. Based on the demographic profile, teachers with 10-20 years of teaching experience are dominated by those aged 31-40 and 41-50. The high GeoCapabilities competency index is influenced by the teacher's long teaching experience, gaining experience across generations that are not too far apart, and ideal teacher age factors. The ideal age in this discussion is not too old to follow

the development of education in the current era and not too young or new to experience in teaching and learning. Meanwhile, teachers with 1 - 10 years of teaching experience have a GeoCapabilities competency index of 23.84% and teachers with more than 20 years of teaching experience have a GeoCapabilities competency of 22.46%. Based on these results, it is analysed that the GeoCapabilities competency index value is low in both age ranges. First, teaching experience of 1-10 years is dominated by teachers aged 21-30 with

relatively recent or short teaching experience. In this age range, teachers' flying and teaching hours are still very small, even though media utilisation in the classroom is quite good. Therefore, teachers with 1-10 years of teaching experience still need a lot of material deepening, curriculum training, and interactive technology training in the classroom. Second, teaching experience >20 years is dominated by teachers aged >50 years with a long teaching experience. In this age range, teacher productivity has declined in teaching and training. Poor technology skills, lack of confidence in operating technology, and difficulties when applying it in the classroom are the main problems of teachers in old age. The administrative burden of the curriculum is quite high with complex learning sequences, making teachers in old age choose to maintain the methods that have long been used, namely, the lecture or conventional method. This triggers the imbalance between the long teaching experience and the teacher's competence.

In the last educational qualification, teachers who graduated with a bachelor's degree in Geography or Geography education had the highest GeoCapabilities competency index in the range of 26.63%. Educational qualification is a factor that influences the mastery of material, curriculum, and learning design applied to students. Teachers with undergraduate qualifications in Geography or Geography education have better GeoCapabilities competencies than teachers who teach differently from their professional competencies. Several research results prove the influence of competence on performance. However, this study has different results. Non-geography or geography education undergraduate qualifications have higher GeoCapabilities competencies at 23.28% compared to a master of Geography Education at 17.30%. These results contradict previous research, which states that higher academic qualifications affect teacher competence and performance. The difference in academic qualifications that do not match the mastery of GeoCapabilities competencies is influenced by several factors, namely; Teachers have a master's qualification in Geography Education are on average more than 50 years old, less confident in using computers compared to younger teachers, lack of application of spatial technology and the internet and the latest

learning methods. Some of these regressive factors greatly affect teacher competence despite having high education qualifications. Meanwhile, undergraduate qualifications in non-geography or geography education are dominated by social education majors, who study the science of geography education. The positive value is that the average teacher with a non-geography or geography education undergraduate degree actively participates in curriculum development training, IT-based geography learning media, and has a much younger age range of 31-40 and 41-50 years.

In addition to the three qualifications above, below are several indicators used to identify the level of teacher competence in GeoCapabilities in this study:

a. Identification of Experience In Learning and Curriculum Training on Teachers' Geocapabilities Index

The GeoCapabilities paradigm in learning can be implemented into the subject curriculum approach. When teachers implement the curriculum in the teaching class, they usually approach it, adapt it, or enforce it in their learning. Teachers have the

same demographic profile assessment characteristics regarding experience, qualifications and professional development training. However, teacher demographic profile assessments have different results influenced by teacher performance level factors, including how they make learning changes and adaptations in the curriculum. Teachers must be able to adapt the formal curriculum to suit the needs of students. In the fidelity approach, the conceptualisation of curriculum includes "a course of study, a set of textbooks, a learning guide, and a set of teacher learning plans" in addition to pre-determined and standardised evaluation instruments and guidelines according to the prevailing formal curriculum.

Based on **Table 5**, the geocapabilities competency index of 36.6% is obtained from the group of teachers who have never had experience in training in the field of learning and curriculum. The acquisition of competency values is dominated by the age of 31 - 40 years, with teaching experience for 11 - 20 years, and the last educational qualification is S1 geography or geography education.

The interview results showed that they have good learning and curriculum skills from teaching experience, actively participating in discussions & deliberations of geography subject teachers, following applicable external curriculum guidelines and developing their own in the classroom, and actively participating in seminars. Increasing the competence of GeoCapabilities educators requires the role of various education stakeholders to make training in the field of learning and curriculum, by age level and educational experience of teachers, because these two things are very influential in the development of GeoCapabilities competencies obtained by teachers.

Table 5. Qualifications Of Training Experience In Learning And Curriculum On The Geocapabilities Index Of Teachers

Qualification	Indicator	f	Percent	GeoCapabilities Competence Index (%)	Information
Experience in learning and curriculum training	Never before	2	7.14	36.6	It is known from teachers aged 31-40 years, with teaching experience of 11-20 years, and the last educational qualification is a bachelor's degree in geography or geography education.
	Never, 1-3 times	11	39.29	22.39	This consists of ages 31-40 and some ages 21-30, with teaching experience of 1-10 years. The last educational qualification is a bachelor's degree in geography education.
	Never, <3	15	53.57	23.66	Dominated by an age range of > 50 years and 41 - 50 years with teaching experience of 11 - 20 and > 20 years, the last educational qualification is between Bachelor of Geography Education, master of Geography Education, and non-graduate of Geography Education or Geography.

b. Experience In Geography Material Deepening Training on Teacher Geocapabilities Index

Teachers need good mastery of the material to build GeoCapabilities competencies in geography learning. Superior material knowledge makes a difference when explaining Geography material in class. Conversely, teachers with weak

content knowledge may provide inaccurate and uninformative information to their students, thus losing the opportunity to teach geography well. To find out how teachers' mastery of geography content is, or lack thereof, in their teaching. The researcher tried to

identify this by reflecting on teachers' experience, teaching, and knowledge. The practice of knowledgeable teachers should be observed through the experience and training of deepening the material obtained by teachers.

Table 6. Identification of Experience in Geography Material Deepening Training on Teacher Geocapabilities Index

Qualification	Indicator	f	Percent	GeoCapabilities Competence Index (%)	Information
Experience in deepening geography training	Never before	6	21.43	23.28	This consists of teachers aged 31 - 40 with 1 - 10 and > 20 years of teaching experience, with the last educational qualification being a non-Geography Education undergraduate.
	Never, 1-3 times	10	35.71	21.3	Dominated by teachers aged 31-40 and some aged 21-30 who have 20 years of teaching experience and 1-10 years, with educational qualifications of a bachelor's degree in geography education.
	=>3 times	12	42.86	27.18	Dominated by teachers in all age groups 41-50 and > 50 years, with teaching experience of> 20 years, the last educational qualification was dominated by bachelor's degrees in geography education and some master's degrees in geography education.

Based on **Table 6,** the geocapabilities competency index of 27.18% was obtained from the group of teachers who had participated in having experience in material deepening training <3 Times. The acquisition of competency values is dominated by teachers in all age groups, 41-50 and > 50 years, with teaching experience>

20 years, with the latest educational qualifications dominated by Bachelor and Master graduates of geography education across generations. The ratio of years of teaching experience significantly affects the depth of material mastered by the teacher. The longer the teaching period, the more the teacher will know about the

materials and curriculum development during each period. The interview results obtained show that teachers have good mastery of the material obtained from teaching experience, actively participating in discussions and deliberations of geography subject teachers, and actively reading books and magazines that can support geography learning activities.

c. Experience In Learning Technology Training on Teachers' GeoCapabilities Index

To build GeoCapabilities competency, teachers must utilise digital technology well in teaching and learning. Technological literacy is one of the basic teaching skills that teachers must master in the 21st-century learning era. If teachers want to prepare their students to have good technological capabilities, they must have, at a minimum, basic technological skills. Using technology by teachers in the school environment can increase students' active participation in learning, increase motivation towards lessons, and facilitate learning the subject. To find out teachers' experience in learning technology, it can be known through traces of experience in learning technology training.

Table 7. Identification of Experience in Learning Technology Training on Teachers' Geocapabilities Index

Qualification	Indicator	f	Percent	GeoCapabilities Competence Index (%)	Information
Experience in learning technology training	Never before	6	21.43	22.18	Consists of teachers aged >50 years and some aged 31-40 years, and 1 - 2 learning and curriculum training experiences.
	Never, 1-3 times	13	46.43	22.52	Dominated by teachers aged 41-50 and some >50, and 1 - 4 learning and curriculum training experiences.
	=>3 times	9	32.14	27.73	Comprised of teachers aged between 21 and 30 and 31 to 40, learning and curriculum training experience =>3

Based on **Table 7,** the highest GeoCapabilities competency index was obtained from the group of teachers who had attended learning technology training> 3 times and consisted of age groups ranging from 21 - 30 and 31 - 40 years, with a value of 27.73%. Based on the results above, the age of teachers and the Number of learning technology

trainings they have significantly attended affect the GeoCapabilities competency index achieved. Age is one of the strong factors that can affect the quality of teaching. One example is in the use of ICT. Roger's (Graham et al., 2020) diffusion of innovation theory states that an individual's age plays an important role in the use of technology. Younger individuals are more likely to accept and use a technology than older individuals. Therefore, to reduce the competency gap in the use of learning technology, learning technology training is needed that is adjusted to the age level. So that mastery of this technology can be evenly distributed to teachers in the old age group and the young age group.

d. Frequency Of Using Geospatial Technology In Geography Learning In The Classroom On Teacher's GeoCapabilities Index

To improve individual GeoCapabilities competencies, the ability to use geospatial technology is required. Geospatial technology deals with the collection or processing of location-related data. These technologies include GIS, remote sensing, and WebGIS. Geospatial technology competencies can improve critical thinking across contexts and disciplines. If teachers are competent in using geospatial technology in the classroom, they effectively prepare their students for careers and understand the broad scope of social characteristics. Therefore, teachers' use of geospatial technology is very important to build students' competence in geography subjects. Teachers' use of geospatial technology can be seen in **Table 8.**

Based on the above research results, the highest GeoCapabilities competency index is obtained from the group of teachers who use geospatial technology with a frequency of "sometimes" and a score of 25.18%. The acquisition of competency scores is dominated by teachers aged 31-40 years, 21-30 years, and a small portion of 41-50 years, with teaching experience ranging from 10-20 and >20 years, learning technology training experience 1-2 times and the use of internet media in the classroom is classified as frequent.

Table 8. Identification of the Frequency of Using Geospatial Technology In Geography Learning in the Classroom Against the Teacher Geocapabilities Index

Qualification	Indicator	f	Percent	GeoCapabilities Competence Index (%)	Information
Frequency of using geospatial technology in geography learning in the classroom	Never before	5	17.86	19.96	It is known that the group of teachers aged >50 years with teaching experience of 11-20 and >20 years, learning technology training experience 1-3 times, and using internet media in the classroom is classified as never and sometimes.
	Sometimes	23	64.28	25.18	Consisting of teachers aged 31-40, 21-30, and a small portion of 41-50 years old, with teaching experience ranging from 10-20 and >20 years, learning technology training experience 1-3 times, and the use of internet media in the classroom is relatively frequent.
	Often	0	0	0	--

The application of geospatial technology in the classroom is dominated by young teachers aged between 21 and 30 years old, middle-aged teachers aged between 31 and 40 years old, and a small proportion of teachers aged 41 to 50 years old. Teachers in the young age group are very good at information and geospatial technology, so they find it easy to make innovations and apply geospatial technology in geography learning. In addition, based on the interview results, it was found that young teachers have very free time and are accustomed to using technology in their daily lives, so it is no longer something new that is difficult to learn. Therefore, action is needed to improve the competence of geospatial technology so that teachers are accustomed to applying it in the learning process. The action can be done by introducing and training geospatial technology for geography learning. Training is conducted based on the age group of geography teachers. This is done because the difference in age groups between young and old teachers will cause a gap in the absorption of the material applied in the training. If the training is adjusted to the age group, it will create the same competency progress.

CONCLUSIONS

The results obtained an average score of respondents' answers to the teacher GeoCapabilities knowledge test of 3.6. The Percentage of achievement of the maximum score of GeoCapabilities obtained was 46.6%. The value of 46.6% is included in the "low" category, which is in the maximum score >36% - 52%. Therefore, it can be described that the average teacher in high school in Karnganyar Regency has a "low" GeoCapabilities competency index towards 21st-century geography learning. The results of the GeoCapabilities knowledge test for each indicator are obtained. 1. Geographic imagination (26.16%), 2. Empathy (22.5%), 3. Integrative thinking (23.6%), 4. Spatial thinking (20.5%), 5. Exploration (29.25%). In conclusion, the results of this study can provide enlightenment for educational planners in the classroom to actively participate in training programs and seminars on the development of educational paradigms and curriculum to improve the competence of geography teachers. The quality of education is encouraged by aligning the curriculum with the demands of future needs. Teachers must have a set of geography knowledge and skills that can be applied to the present and future, which can build the competence of their students. The limitation of this research is the need to increase the competence of geography teachers in Karanganyar Regency in spatial thinking, empathy, and integrative thinking through technology training and spatial geography analysis. Every educational institution must prepare new literacy and guided orientation in the field of education, such as the development of GeoCapabilities competencies. Why is this so important to implement? Because in this way, the quality of learning and the learning paradigm of geography teachers will develop to align with the development of future geography competencies through appropriate learning. The suggestions for further research are identifying the teacher's personality, the character of learning brought, and the knowledge of geography learning literacy based on the evaluation results to determine the level of competence of geography teachers in Karanganyar Regency.

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