

# Competency of Chemistry Teachers Based on Self-Evaluation to Plan the Chemistry Teacher Training Strategy in Palu City, Central Sulawesi

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## Abstract

The purpose of this study was to obtain an overview of the pedagogical, personal, social and professional competence of chemistry teachers in Palu City. This study used descriptive method with document study and interview techniques. The results of study showed the competency of chemistry teachers in Palu City was 74. The pedagogical competency score was 71 with the implementation of assessment, process evaluation, and learning outcomes with a value of 66 as a low sub competency. The personality competency score was 81 with self-presentation as a stable, stable, fair and authoritative person with a score of 77 as a low sub competency. Social competence score was 74 with communication with the professional community itself and other professions verbally and in writing or other forms with a value of 67 as a low sub competency. The professional competence score was 70 in the development of professionalism on an ongoing basis by taking reflective actions with a value of 66 as a low sub competency. The number of chemistry teachers who still need to improve pedagogical competence was 33 (87%), in personality competence was 15 (61%), in social competence was 25 (66%), and in professional competence was 33 (87%). It can be concluded that strategies to increase the competency of chemistry teachers in Palu City were direct mentoring by school principals and supervisors, training at the MGMP level, Education Office, LPMP, P4TK and LPTK, IHT, Workshop, and Technical guidance. The presentation model of training material is connected, scientific and character.

**Keywords:** competency, mapping, self-evaluation, chemistry teachers

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## INTRDODUCTION

Teacher competency issues must receive serious attention as in neighboring countries such as Japan, Taiwan, and China. The three countries highly uphold the role of teaching competencies that must be possessed by teachers in schools. For example, in Japan, the selection to become a teacher is so strict. Every year, two hundred thousand teacher candidates take an exam to get a certificate of teaching competency, but only one fifth succeeds (Uno and Lamatenggo, 2016)

The quality of education is the main capital to compete with other countries. For example, the country with the best education system in the world is Finland. Every year the education system in Finland always ranks first. There are 5 things that make Finland as the country with the best education system in the world, namely (1) all schools are managed by the government, (2) there is no homework, (3) there is no national exam, (4) a flexible education curriculum, (5) best quality teacher (Bhakti and Ghiffari, 2018).

Teacher Competency Test (UKG) in 2015 was conducted for all subjects, including chemistry teachers at the high school level in Palu City. The competency test results can provide an overview of the chemistry teacher competency map, however, it only contains a pedagogical competency map and a professional competency map and does not yet contain personality competency and social competency. A good teacher training plan must be based on a teacher competency map consisting of pedagogical, personal, social and professional competencies so that the use of self-evaluation results in the preparation of a chemistry teacher competency map and the preparation

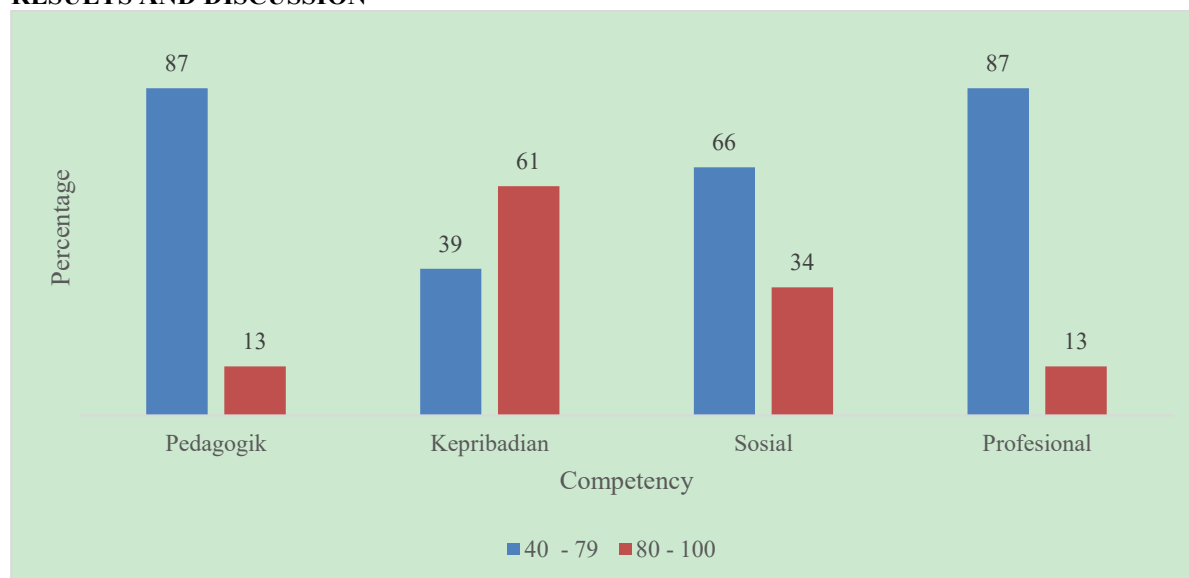
of a chemistry teacher training strategy has benefits. For this purpose, we conducted a study entitled The Competency Map of Chemistry Teachers based on Self-Evaluation as a Basis in Planning Strategies to Train Chemistry Teachers in Palu City, Central Sulawesi.

The study aimed to obtain an overview of the pedagogical, personal, social and professional competencies of chemistry teachers in Palu City and an overview of the strategies to train chemistry teachers in Palu City.

## RESEARCH METHOD

This study was conducted for 3 months, from December 2018 to February 2019. This study used descriptive methods. Data collection used document study and interview techniques. A document study was conducted on 38 chemistry teachers from 10 high schools in Palu City. Interviews were conducted with chemistry teacher supervisors in Palu City on the self-evaluation data and chemistry teacher training strategies. Data analysis used an analysis of quantitative data and qualitative data. Quantitative data analysis was performed in a descriptive form. Descriptive analysis was intended to describe data in the form of averages, percentages and frequency distributions of teacher competency mapping. This analysis was also intended to formulate a strategy that must be carried out in implementing chemistry teacher training in Palu City. Competency map of each sub competency and each competency was calculated by the following formula:  $NA = \frac{SP}{SM} \times 100$  where NA is the final score, SP is the score obtained and SM is the maximum score. The self-evaluation of the chemistry teacher determined the map of chemistry teacher competency. The minimum competency standards to be a competent chemistry teacher is 80 (GTK, 2016). The grouping of chemistry teachers as a result of self-evaluation in the frequency distribution was divided into 2 groups, namely groups with a score above and below 80.

## RESULTS AND DISCUSSION



**Figure 1 Percentage of Chemistry Teachers who have score < 80 and >=80**

Figure 1 shows that most teachers had low pedagogical competence of 87%, personality competence was high of 61%, social competence was low of 66% and professional competency was also low of 87%.

Table 1 Pedagogical Competence of Chemistry Teachers in Palu City

No.	Pedagogic Competencies and Sub Competencies	Score $\geq$ 80	Score < 80	Score
1.1	Know the characteristics of students from the physical, moral, spiritual, social, cultural, emotional, and intellectual aspects	20	18	77
1.2	Know the learning theory and principles of learning	8	30	69
1.3	Develop a curriculum related to the subjects being taught	13	25	73
1.4	Organize educational learning	11	27	71
1.5	Utilize information and communication technology for learning purposes	27	11	76
1.6	Facilitate the development of potential learners to actualize various potentials	21	17	71
1.7	Communicate effectively, empathically, and politely with students	11	27	68
1.8	Carry out assessment and evaluation of learning processes and outcomes	2	36	66
1.9	Utilize the results of assessment and evaluation for learning	17	21	72
1.10	Perform reflective action to improve the quality of learning	4	34	66
FINAL SCORE		5	33	71

Pedagogic competency mapping is conducted to evaluate the quality of education on target and evenly so that education mapping is very important to see the quality of education in an area (Hartono et al., 2013). Quality mapping is a series of activities to determine the conditions and situations that illustrate the map of education quality (Marannu, 2016).

Table 1 shows that there were still 33 (87%) chemistry teachers in Palu City who had scores below 80 on pedagogical competence. This condition shows that the majority of chemistry teachers in Palu City were not yet competent and still need to develop competencies. The results of interviews with chemistry teacher supervisors showed that many chemistry teachers rarely attend the training. Based on this information, the strategy that must be taken in developing the pedagogical competence of chemistry teachers in Palu City is training. The training variable had a positive and significant influence on teacher productivity (Rapareni, 2013)

Pedagogic competencies and professional competencies of natural science teachers were in a low category (Table 1 and Table 4). The results of interviews with teacher supervisors in Palu City showed that the ability of chemistry teachers in managing learning was still low, especially in the assessment. Pedagogical competence is basically the ability of teachers to manage learning activities. If pedagogical competency is low, it can be ensured that the teacher has problems in managing learning activities. Alternative solutions in increasing the competence of chemistry teachers are direct mentoring by supervisors, IHT, and training (Novauli. M, 2015).

Another strategy that can be used to improve the pedagogical competence is through In-House Training. Teacher development through In House Training in each school contributes greatly to improve the teacher competency (Arif, 2013)

Table 2 Personality Competence of Chemistry Teachers in Palu City

No.	Personality Competencies and Sub Competencies	Score $\geq$ 80	Score < 80	Score
2.1	In accordance with Indonesian national religious, legal, social and cultural norms	31	7	86
2.2	Present as an honest, noble, and role model for students and the community	32	6	83
2.3	Present as a person who is steady, stable, mature, wise, and authoritative	25	13	77
2.4	Demonstrates work ethic, high responsibility, pride in being a teacher, and self-confidence	28	10	80
2.5	Uphold the code of ethics of the teaching profession	27	11	79
FINAL SCORE		23	15	81

Table 2 shows that there were still 15 (39%) chemistry teachers in Palu City who had scores below 80 on personality competency. This showed that the 15 people still needed to participate in continuing professional development in the form of mentoring, self-study and training.

Table 3 Social Competence of Chemistry Teachers in Palu City

No.	Social Competencies and Sub Competencies	Score $\geq$ 80	Score < 80	Score
3.1	Be inclusive, act objectively, and do not discriminate against gender, religion, race, physical condition, family background, and socioeconomic status.	25	13	81
3.2	Communicate effectively, empathically, and politely with fellow educators, education personnel, parents, and the community	16	22	76
3.3	Adapt in place of duty throughout the territory of the Republic of Indonesia which has socio-cultural diversity	18	20	71
3.4	Communicate with the professional community itself and other professions verbally, in writing, or in other forms	8	30	67
<b>FINAL SCORE</b>		<b>13</b>	<b>25</b>	<b>74</b>

Table 3 shows that there were still 25 (66%) chemistry teachers in Palu City who had scores below 80 on social competence. This shows that the 25 teachers still needed to participate in continuing professional development at the school level in the form of direct mentoring by the school principal and school supervisor.

The strategy to increase personality and social competence are the direct mentoring by supervisors and school principals in using certain media because personality competence and social competence are used to manage emotional intelligence. One important factor that is relevant to personality competence and social competence is emotional intelligence (Hendri, 2010). Another thing that supports this strategy is the study by (Kurniawan, 2014) which concluded that the supervisory block developed was effective in increasing teacher professionalism.

Table 4 Professional Competence of Chemistry Teachers in Palu City

No.	Professional Competencies and Sub Competencies	Score $\geq$ 80	Score < 80	Score
4.1	Know the material, structure, concepts, and scientific mindset that supports the subject of learning	9	29	67
4.2	Know the competency standards/core competencies and basic competencies of the subjects being taught	14	24	75
4.3	Develop learning materials that are taught creatively	15	23	69
4.4	Develop professionalism in a sustainable manner by taking reflective action	7	31	66
4.5	Utilize information and communication technology in self-development	21	17	74
<b>FINAL SCORE</b>		<b>5</b>	<b>33</b>	<b>70</b>
<b>MEAN SCORE OF COMPETENCIES</b>		<b>10</b>	<b>28</b>	<b>74</b>

Table 4 shows that there are still 33 (87%) chemistry teachers who still had scores below 80 on professional competence. The results of interviews with chemistry supervisors showed the causes of the low professional competence were due to the lack of awareness of chemistry teachers in MGMP, lack of subject training and lack of budget for MGMP activities. Another fact that causes the lack of professional competence was the design of training which mostly revolved around pedagogics and did not lead to follow-up in the field. It shows that the 33 chemistry teachers still needed to participate in the sustainable professional development at the MGMP level, the Education Office, LPMP and UNTAD in the form of training with the IN-ON-IN system.

Teacher competency issues can be resolved through public consultation, training and partnerships with LPTK (Mahdum et al, 2011). Another strategy that can be carried out in improving teacher competence is by strengthening the internal quality assurance system (SPMI). In addition, the improvement of education quality is an integrated process with the improvement of human resources quality (Riduwan, 2015). All material presented in teacher training both at the school level, the Office of Education and Culture, LPMP and LPTK on mentoring, IHT, Workshop, Training, Technical guidance must use the Consicha model ( *Connected, Scientific, Character* ).

## CONCLUSION

Teacher competencies in the low category were pedagogic, social, and professional competencies in conducting chemistry learning activities in schools. Strategies to increase the competency of chemistry teachers in Palu City were direct mentoring by school principals and supervisors, training at the MGMP level, Education Office, LPMP, P4TK and LPTK, IHT, Workshop, and Technical guidance. The presentation model of training material is connected, scientific and character.

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#### **DISCLOSURE STATEMENT**

The author reported no potential conflict of interest.

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