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Abstract

The present research aimed to identify the comprehension level of physics science nature among secondary school physics teachers, teaching methods they made use of, and the relationship among them. The researcher used the descriptive analytical approach, and designed two research tools: physics science nature test, and teaching methods questionnaire. The researcher selected a random sample of Gazan secondary school physics

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teachers (30) of whom were males and (28) were females. He used means, percentages, t. test, ANOVA, Scheffee test and Pearson coefficient correlation as statistical techniques. The results were as follows; (1) comprehension level of physics nature among the sample was (72.66%); (2) there was a difference of statistical significance in the mean scores of science nature comprehension among the sample attributable to sex and in favor of females; (3) There were no statistically significant differences in the mean scores of the science nature comprehension in the sample attributable to teaching experience; (4) the most frequently used teaching methods were discussion , moving forward in solving physics problems, giving examples, concept maps, analogies, deduction, and brainstorming, (5) there was a relationship between the physics nature comprehension and teaching methods in physics teaching .

Key words: physics science nature, teaching methods, physics teacher.

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10	53.41	4.27		19	44.84	3.59	
7	54.55	4.36		24	40.28	3.22	
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- Abell, S. & etal (2001). That's what scientists have to do': Preservice elementary teachers' conceptions of the nature of science during a moon investigation. *International Journal of Science Education*, 23(11), 1095-1109.
- Afonso, A. & Gilbert, J. (2010). Pseudo- science: A meaningful context for assessing of nature of science. *International Journal of Science Education*, 32(3), 329-348.
- Al-zobi, T. & etal (2011). The effect Of Jordanian faculty Members' beliefs about Scientific Knowledge. *Mu'tah Lil-Buhuth wad-Dirasat, Humanities and Social Sciences Series*, 26(5), 9-32.
- Bolinger, K. & Warren, W. (2007). Methods Practiced in Social Studies Instruction: A review of Public School Teacher's Strategies. *International Journal of Social Education*, 22(1), 68-84.
- Buffler, A. & etal (2009). The Relationship between Students' Views of the Nature of Science and their Views of the Nature of Scientific Measurement. *International Journal of Science Education*, 31(9), 1137-1156.
- Chin, Ch. (2005). First Year Pre-Service Teachers in Taiwan, Do They Enter the Teacher Program with Satisfactory Scientific Literacy and Attitudes Toward Science? *International of Science Education*, 27(13), 1549-1570.
- Ferreira, S. & Morais, A. (2011). The Nature of Science Curricula: Methods and concepts of analysis. *International Journal of Science Education*, (29), Sep. 1-22.
- Hashweh, M. (2006). Palestinian Science Teachers' Epistemological Preliminary Survey. *Research in Science Education*, 26(1), 89-102.
- Hipkins, R. & etal, (2005). Teaching The Nature of Science: Modest Adaptations or Radical Preconception. *International Journal of Science Education*, 27(2), 243-254.

2013

- Holbrook, J. & Rannikmae, M. (2007). The Nature of Science Education for Enhancing Scientific Literacy. *International Journal of Science Education*, 29(11), 1347-1362.
- King, L. & etal (2004). Biology Teachers' Attitudes to Dissection and Alternatives. *The Humane Society of the United State*, 32(1), 475-484.
- Lee, O. & etal (2008). Urban elementary school teachers' knowledge and practices in teaching science to English language learners. *Science Education*, 92(4), 733-758.
- Liang, J. &etal (2010). The relations between scientific epistemological beliefs and approaches to learning science among science- major undergraduates in Taiwan. *The Asia- Pacific Education Researcher*, 19(1), 43-59.
- Lin, Sh. & etal (2012). Affording Explicit-Reflective Science Teaching by Using an Educative Teachers' Guide. *International Journal of Science Education*, 34(7), 999-1026.
- Lising, L. &Elby, A. (2004). The impact of epistemology on learning: a case study. *American Journal of Physics*, 74(4), 243-367.
- Mistades, V. (2007). High School Physics Teachers Attitudes toward Physics and Learning Physics. *Journal of Education and Human Development*, 1(2), 14-21.
- Murphy, C. &etal. (2007). Primary science teacher confidence revisited ten year on. *Educational Research*, 49(4), 415-430.
- Niessen, Th. & etal, (2008). Contemporary Epistemological Research in Education: Reconciliation and Reconceptualization of field. *Theory & Psychology*, 18(1), 27-45.
- Phan, H. (2006). Examination of student learning approaches, reflective thinking, and epistemological beliefs: A latent variables approach. *Electronic Journal of Research in Educational Psychology*, 4(3), 577-610.
- Schwartz, R. & Lederman, N. (2008). What Scientists Say: Scientists' views of nature of science and relation to science context. *International Journal of Science Education*, 30(6), 727- 771.
- Schwartz, R. &Lederman, N. (2004). Developing Views of Nature of Science in an Authentic Context: An Explicit approach to Bridging The Gap Between Nature of Science and Scientific Inquiry. *Science Education*, 88(4), 610-645.
- Yao Liu, Sh. &Lederman, N. (2007). Exploring Prospective Teachers' Worldviews and Conceptions of Nature of Science. *International Journal of Science Education*, 29(10), 1281-1307.