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OPEN©ACCESS The Effects of Teaching Mathematics Performed with the Help of CSCM on Conceptual Learning					CE Subscription		
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Author(s) Ramazan Gürbüz, Emrullah Erdem, Selçuk Fırat ABSTRACT						About CE News	
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This paper explores the effect of teaching mathematics performed with the help of Computer-Supported Concept Maps (CSCM) on the conceptual learning. To achieve this end, CSCM were developed and used in the process of teaching probability subject. Within the true-experimental research method, a pre- and post- test control groups study was conducted with 39 seventh graders—20 in experimental group, and 19 in the control group. Each group was taught three times/week, 40 min/session, for 4 weeks. A 12-item instrument was used to collect data. After the teaching intervention, the same instrument was re-administered to both groups as post-test. The results suggested that students in the experimental group performed significantly better than those in the control group, in terms of conceptual learning. KEYWORDS Teaching Mathematics; Computer-Supported Concept Maps (CSCM); Conceptual Learning; Cooperative Learning; Probability					Recommend to Peers		
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CSCM on Concept	ual Learning. Creative Edu	<i>cation, 3,</i> 1231-1240). doi: 10.4236/ce.2012.37	182.	• The Conferen	nce on Informatio	
References [1] Anderson-Inman, L., & Zeitz, L. (1993). Computer-based concept mapping: Active studying for active learners. Computing Teacher, 21, 6-11.					Technology in Education (CITE 2012)		
	Inman, L., & Horney, M. (1 isual thinking. Journal of A		ed concept mapping: Enha Literacy, 40, 302-306.	ncing literacy with			
	meaningful learning in sc		(1998). Computerbased over the second				
	Inman, L., & Ditson, L. (1 Learning and Leading with	, ,	sed concept mapping: A to 3.	ool for negotiating			
stakes ext		south wales, Austra	teaching in the context of lia. British Educational Res	· · ·			
	, & Chick, H. L. (2007). , 12, 8-13.	Making the most	of chance. Australian Prir	mary Mathematics			

[7] Baki, A., & Mandaci-?ahin, S. (2004). Assessment of preservice teachers' mathematical learning through computer aided concept mapping method. TOJET, 3, 91-104.

[8] Ball, D. L. (1988). Knowledge and reasoning in mathematical pedagogy: Examining what prospective teachers bring to teacher education. Unpublished Ph.D. Thesis, East Lansing, MI: Michigan State University.

- [9] Ball, D. L. (1990). The mathematical understandings that prospective teachers bring to teacher education. Elementary School Journal, 90, 449-466. doi:10.1086/461626
- [10] Batanero, C., & Serrano, L. (1999). The meaning of randomness for secondary school students. Journal for Research in Mathematics Education, 30, 558-567. doi:10.2307/749774
- [11] Bezzina, F. (2004). Pupils' understanding of probabilistic & statistics (14-15+) difficulties and insights for instruction. Journal of Maltese Education Research, 2, 53-67.
- [12] Black, P., & Wiliam, D. (1998). Assessment and classroom learning. Assessment in Education, 5, 7-74. doi:10.1080/0969595980050102
- Boaler, J. (1997). Experiencing school mathematics: Teaching styles, sex and setting. Buckingham: Open University Press.
- [14] Brown, D. S. (2003). High school biology: A group approach to concept mapping. The American Biology Teacher, 65, 192-197.
- [15] Chang, K. E., Sung, Y. T., & Chen, S. F. (2001). Learning through computer-based concept mapping with scaffolding aid. Journal of Computer Assisted Learning, 17, 21-33.
- [16] Chang, K. E., Sung, Y. T., & Chen, I. D. (2002). The effect of concept mapping to enhance text comprehension and summarization. The Journal of Experiment Education, 71, 5-23. doi:10.1080/00220970209602054
- [17] Chernoff, E. J. (2009). Sample space partitions: An investigative lens. Journal of Mathematical Behavior, 28, 19-29. doi:10.1016/j.jmathb.2009.03.002
- [18] Chiu, C. H., & Hsiao, H. F. (2010). Group differences in computer supported collaborative learning: Evidence from patterns of Taiwanese students' online communication. Computers & Education, 54, 427-435. doi:10.1016/j.compedu.2009.08.026
- [19] Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Hillsdale, NJ: Erlbaum.
- [20] Davis, B., & Simmt, E. (2006). Mathematics-for-teaching: An ongoing investigation of the mathematics that teachers (need to) know. Educational Studies in Mathematics, 61, 293-319. doi:10.1007/s10649-006-2372-4
- [21] Erdem, E. (2011). An investigation of the seventh grade students' mathematical and probabilistic reasoning skills. Unpublished M.A. Thesis, Ad?yaman: Ad?yaman University.
- [22] Even, R., & Kvatinsky, T. (2010). What mathematics do teachers with contrasting teaching approaches address in probability lessons? Educational Studies in Mathematics, 74, 207-222. doi:10.1007/s10649-010-9234-9
- [23] Fast, G. (1997). Using analogies to overcome student teachers' probability misconceptions. Journal of Mathematical Behavior, 16, 325- 344. doi:10.1016/S0732-3123(97)90011-0
- [24] F?rat, S. (2011). The effect of mathematics teaching performed through educational computer games on conceptual learning. Unpublished M.A. Thesis, Ad?yaman: Ad?yaman University.
- [25] Fischbein, E., Nello, M. S. & Marino, M. S. (1991). Factors affecting probabilistic judgements in children and adolescents. Educational Studies in Mathematics, 22, 523-549. doi:10.1007/BF00312714
- [26] Gürbüz, R. (2006a). Concept maps for the teaching of probability. 100th Year University Education Faculty Journal-Online, 3, 133- 151.
- [27] Gürbüz, R. (2006b). Development of practice sheets for probability concept. Cukurova University Education Faculty Journal, 31, 111- 123.
- [28] Gürbüz, R. (2007). The effects of computer aided instruction on students' conceptual development: A case of probability subject. Eurasion Journal of Educational Research, 28, 75-87.
- [29] Gürbüz, R. (2010). The effect of activity based instruction on conceptual development of seventh grade students in probability. International Journal of Mathematical Education in Science and Technology, 41, 743-767. doi:10.1080/00207391003675158
- [30] Gürbüz, R., ?atl?o?lu, H., Birgin, O., & Erdem, E. (2010). An investigation of fifth grade students' conceptual development of probability concepts based on activity based instruction: A quasi-experimental study. Educational Sciences: Theory & Practice, 10, 1053-1068.

- [31] Gürbüz, R., & Birgin, O. (2012). The effect of computer-assisted teaching on remedying misconceptions: The case of the subject " probability". Computers & Education, 58, 931-941. doi:10.1016/j.compedu.2011.11.005
- [32] Gürbüz, R., Birgin, O., & ?atl?o?lu, H. (2012). Comparing the probability-related misconceptions of pupils at different education levels. Croatian Journal of Education, 14, 307-357
- [33] Heinze-Fry, J. A., & Novak, J. D. (1990). Concept mapping brings longterm movement towards meaningful learning. Science Education, 74, 461-472. doi:10.1002/sce.3730740406
- [34] Hill, H. C., Rowan, B., & Ball, D. L. (2005). Effects of teachers' mathematical knowledge for teaching on student achievement. American Educational Research Journal, 42, 371-406. doi:10.3102/00028312042002371
- [35] Huang, H. S., Chiou, C. C., Chiang, H. K., Lai, S. H., Huang, C. Y., Chou, Y. Y. (2012). Effects of multidimensional concept maps on fourth graders' learning in web-based computer course. Computers & Education, 58, 863-873. doi:10.1016/j.compedu.2011.10.016
- [36] Johnson, D. W., & Johnson, R. T. (1989). Cooperation and competition (2nd ed.). Edina, MI: Interaction.
- [37] Jonassen, D. H. (1996). Computer in the classroom: Mindtools for critical thinking. Eaglewoods, NJ: Merill/Prentice Hall.
- [38] Jones, G. A., Langrall, C. W., Thornton, C. A., & Mogill, T. A. (1997). A framework for assessing and nurturing young children' s thinking in probability. Educational Studies in Mathematics, 32, 101-125.
- [39] Kahneman, D., & Tversky, A. (1972). Subjective probability: A judgment of representativeness. Cognitive Psychology, 3, 430-454. doi: 10.1016/0010-0285(72)90016-3
- [40] Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. American Psychologist, 58, 697-720. doi:10.1037/0003-066X.58.9.697
- [41] Keren, G. (1984). On the importance of identifying the correct " problem space". Cognition, 16, 121-128. doi:10.1016/0010-0277(84)90002-7
- [42] Kwon, S. Y., & Cifuentes, L. (2009). The comparative effect of individually-constructed vs. collaboratively-constructed computer-based concept maps. Computers & Education, 52, 365-375. doi:10.1016/j.compedu.2008.09.012
- [43] Lecoutre, M. P. (1992). Cognitive models and problem spaces in " purely random" situations. Educational Studies in Mathematics, 23, 557-568. doi: 10.1007/BF00540060
- [44] Ledesma, E. F. R. (2010). Using an interactive computer system to support the task of building the notions of ratio and proportion. Creative Education, 1, 115-120. doi:10.4236/ce.2010.12017
- [45] Matin, M. A. (2012). Interactive computer-centered instructions for science and engineering education. Creative Education, 3, 375-379. doi:10.4236/ce.2012.33059
- [46] Nilsson, P. (2007). Different ways in which students handle chance encounters in the explorative setting of a dice game. Educational Studies in Mathematics, 66, 293-315. doi:10.1007/s10649-006-9062-0
- [47] Nilsson. P. (2009). Conceptual variation and coordination in probability reasoning. Journal of Mathematical Behavior, 28, 247-261. doi:10.1016/j.jmathb.2009.10.003
- [48] Novak, J. D., & Gowin, B. (1984). Learning how to learn. New York: Cambridge University Press. doi:10.1017/CB09781139173469
- [49] Novak, J. D., & Ca?as, A. J. (2006). The origins of the concept mapping tool and the continuing evolution of the tool. Information Visualisation Journal, 5, 175-184. doi:10.1057/palgrave.ivs.9500126
- [50] Polaki, M. V. (2002). Using instruction to identify key features of basotho elementary students' growth in probabilistic thinking. Mathematical Thinking and Learning, 4, 285-313. doi:10.1207/S15327833MTL0404_01
- [51] Pratt, D. (2000). Making sense of the total of two dice. Journal for Research in Mathematics Education, 31, 602-625. doi:10.2307/749889

- [52] Rautama, E. (2000). Extending the delivery of concept maps. AAPS project, ITiCSE. The 5th Annual Conference on Innovation and Technolology in Computer Science Education.
- [53] Royer, R., & Royer, J. (2004). Comparing hand drawn and computer generated concept mapping. Journal of Computers in Mathematics and Science Teaching, 23, 67-81.
- [54] Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. Educational Researcher, 15, 4-14.
- [55] Shulman, L. S. (1987). Knowledge and teaching: Foundation of the new reform. Harvard Educational