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(Unifying Theme)

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Factor Analysis

Unifying Themes



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Misconceptions

Novak Ausabel Bruner

Tyler

" (Ennenbach,1983)

(Zoller, 1996; Gil-Pers & Carrascosa, 1990) "

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(Tayler, 1952)

(Ennenbach,1983)

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(Gil-Pers & Carrascosa, 1990)

(Nazario et al., 2002)

(Nicoll, 2000)

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Descriptive Research

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(Unifying Themes)

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(Blosser, 1987; Apeleman, et al. 1982; Hassan, et al. 1999) :

(Lawrenz, 1986;) :

(Ivowi & Oludotun, 1987) :

(Giene, 1987; Stover & Sanuders, 2000) :

"Preconceptions

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"Naiveconcepts

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"Mistakes

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"Alternative concepts

"Misleading ideas

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.(Blosser, 1987) "Misconceptions

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(Apeleman, et al. 1982; Confrey, 1987)

: "Conceptual Barriers to Learning

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: () Fisher

: (Hummer, 1996; Stover & Saunders, 2000)

() Hasan et al.

cognitive structures

() Clerk & Rotherford



" :Concept Map

.(Novak, 1985, pp.20-21) "

:(Zoller, 1996; Slaver & Saunders, 2000)

.(Fellows, 1994)

.(Stover & Saunders, 2000)

.(Hasan et al., 1999)

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(Clerk & Rotherford, 2000)

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Index

() Hasan et al.

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Nazario et al.

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() Lawrenz

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(Carrascosa, 1987, in Gil-Perz & Carrascosa, 1990)

(1996) Al-Rubayea

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"Misconceptions"

"Misunderstandings"

No-conception"

(Hasan et al., 1999; Zoller, 1996)

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(1987) Ivowi & Oludotun

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(1990) Gil-Perz & Carrascosa كوسا



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Built into the hardware of the brain

& Driver,

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(in Giene, 1987 Clough 1985)

(Giene, 1987)

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.(Bunge et al., 1995)



(Zoller, 1996)

(Stover & Saunders, 2000)

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(Schoon & Boone, 1997)

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"Riggs Elementary Science Teaching Efficacy

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Belief Instrument"

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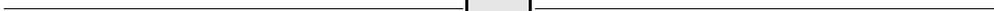
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(Lawrenz, 1981; Perz & Carrascosa,
1990; Trembath, 1990; Phillips, 1991)

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(SPSS)

Crombach's Alpha coefficient



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معامل تأكد طلاب مجموعة الإجابات الصحيحة عن السؤال = $\frac{\text{مجموع القيم (درجات التأكد ١، ٢، ٣) التي أعطاهها الطلاب لإجاباتهم الصحيحة عن ذلك السؤال}}{\text{مجموع الإجابات الصحيحة لذلك السؤال}}$

معامل تأكد طلاب مجموعة الإجابات الخطأ عن السؤال = $\frac{\text{مجموع القيم (درجات التأكد ١، ٢، ٣) التي أعطاهها الطلاب لإجاباتهم الخطأ عن ذلك السؤال}}{\text{مجموع الإجابات الخطأ لذلك السؤال}}$

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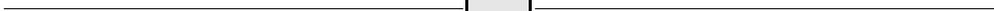
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Internalization

Mind's Eye



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.(Born,1962)

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(Unifying Themes)

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(Factor Analysis)

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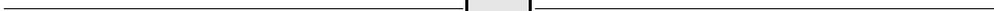


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:Advance Organizer

:Inquiry Approach

:Concept Attainment



(Unifying Themes)

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Al-Rubayea,A.A.M.(1996). An analysis of Saudi Arabian high school students' misconceptions about physics concepts. Unpublished doctoral dissertation.Kansas State University, Manhatan,Kansas.

Blosser, P. (1987). Science misconceptions research and some implications for the teaching of science to elementary school students. Science Education Digist, ED 282776.

Born, M. (1962). Einstein's theory of relativity. NY: Dover publications, Inc.

Bunge,M.; Ibarra, R., & Herleth C. (1995). Interactive based multimedia mechanics: Washonton DC. NSF:



Clerk, D., & Rotherford, M. (2000). Language as a confounding variable in the diagnosis of misconceptions. *International Journal of Science Education*, 22, 703-717.

Confrey, J. (1987). Misconceptions across subject matters: Science and mathematics programming. *Proceedings of the Second International Seminar on Misconceptions and Educational Strategies in Science and Mathematics*. Ithaca, Ny: Cornell University.

Ennenbach, W. (1983, June). The influence of model instruction on "Conception and misconception- learning" in biology and physics. *Proceeding of the First International seminar on Misconceptions in Science and Mathematics*, Ithaca, NY: Cornell University.

Fellws, N. (1994). A window into thinking: Using student writing to understand conceptual change in science learning. *Journal of Research in Science Teaching*, 31, pp. 985-1001.

Gel-Perez, D., & Carrascosa, J. (1990). What to do about science misconceptions. *Science Education*, 74, 531-540.

Hartfree, w. F. (1987). Misconceptions in science and mathematics: A view from Britain. *Proceeding of the Second International Seminar on Misconceptions and Educational Strategies in Science and Mathematics*. Ithaca, NY: Cornell University.

Hasan, S.; Bagayoko, D. & Kelly, E. (1999). Misconceptions and the certainty of response Index (CRI). *Physics Education*, 34, 249-99.

Hwaking, S. W. (1988). *A brief history of time*. Bantam press: London

Ivowi, U. M. & Oludotun, J. S. (1987). An investigation of sources of misconceptions in physics. *Proceedings of the Second International Seminar on Misconceptions and Educational Strategies in Science and Mathematics*. Ithaca, NY: Cornell University.

Lawrenz, F. (1986). Misconceptions of physical science concepts among elementary school teachers. *School Science and Mathematics*, 86, 654-660.

Nazario, G. M. ; Burrowes, P. A. (2002). Persisting misconceptions. *Journal of College Science Teaching*, 31, 292-296.

Nicol, G. (2001). A report of undergraduates bonding misconceptions. *International Journal of Science Education*, 23, 707-730.

Novak, J. D. (1984). *Learning how to learn*. London: Cambridge University Press.

Philips, W. C. (1991). Earth science misconceptions. *The Science Teacher*, 58, 21-23



Prather, J. P. (1985, April). Philosophical examination of the problem of the unlearning of incorrect science concepts. A paper presented at the annual meeting of the National Association of Research in Science Teaching. French Lick, Indiana.

Schoon, K. J., & Boone, W. J. (1997, June). Self-efficacy of preservice elementary teachers and alternative conceptions of science. Proceedings of Fourth International Seminar on "From Misconception to Construct Understanding" Ithaca, NY: Cornell University.

Stover, S., & Saunders, G. (2000). Astronomical misconceptions and the effectiveness of science museums in promoting conceptual change. *Journal of Elementary Science Education*, 12, 41-52.

Trembath, R. J. (1981, April). Frequencies and origins of scientific Misconceptions. Paper Presented at the Annual Meeting of the National Association of Research in Science Teaching, Grossinger, NY.

Tyler, R. (1949). *Basic principles of curriculum and instruction*. Chicago: The University of Chicago Press.

