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: Impaired or Handicapped

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: **Sensory Handicap**

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: **Physical and Motor Handicap ()**

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: **Social and Psychological Handicap**

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: Mental Handicap .

(Visually

Handicapped)

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) (Partially Sighted)

(Totally Blind)

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.(Jernigam, K. , 1995, p. 1) "

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(Visual Field)

(Visual Acuity)

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The Degree of Blindness :

Partially Seeing :

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Blind :

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(Chapman, 1980)

Continuous

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The Degree of Blindness

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: The Age of Onset

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: Totally Congenitally Blind .

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: Partially Congenitally Blind .

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: Totally Adventitiously Blind .

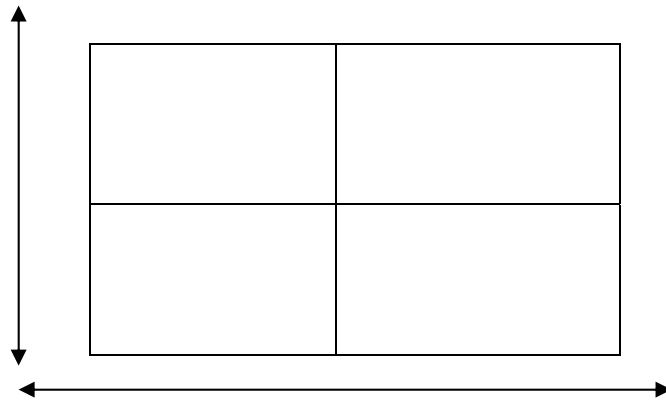
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: Partially Adventitiously Blind .

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(Scohll, 1986)

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(Berkins Barille)

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Efficient Use

of Intact Senses

“Orientation and Mobility”

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(Separation)

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(Mainstreaming)

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 : **Tactile Approach** .
 (Braille Code)
 (Nemeth Code) (Braille Code)
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 (MAVIS)
Francioni, J. M. and A. C.)
 . (Smith, 2002, pp. 91 - 95)
 (Audio - Tactile Tablets)
 . (Blank, A. , et al, 1994)

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: **Audio Approach**

(Nemeth, A. ,1995)

Mathtalk Maths *

(York university)

* انظر كلاً من :

Edwards, A. D. N (1998). Access to Mathematics for Blind People: The Maths Project. Maths and Stats Journal Vol. 9, No. 2 pp. 14-15.

Edwards, A. D. N. and R. D. Stevens (1995). A Multimodal Interface for Blind Mathematics Students. available online at:
<http://citeseer.nj.nec.com/344287.html>

Mathgrasp

(MAVIS)

(Karshmer, A. I., E. Prontelli (

. and G. Gupta, 1999, pp. 5 -10)

Aster

(Latex)

. (Raman, T. V., 1994, p. 3)

Tonal Approach

Stevens, R. D. and A. D. N. Edwards (1994) Mathtalk: Usable access to mathematics. Information Technology and Disability Journal, vol.1, No. 4, November 1994, available online at:
<http://www.rit.edu/easi/itd/itdv01n4/article3.html>

Stevens, R. D. and A. D. N. Edwards (1994). Mathtalk: The Design of an Interface for Reading Algebra Using Speech. available online at:
<http://citeseer.nj.nec.com/stevens94mathtalk.html>

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. Karshmer, A. I. and C. Bledsoe, 2002, p. 5))

Integrated Approach

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*نظر كلا من :

Sahyun, S., J. Gardner, C. Gardner, and L. Benton (1998). Audio and Haptic Access to Math and Science - Audio graphs, Triangle, the MathPlus Toolbox, and the Tiger printer. available online at: <http://dots.physics.orst.edu/publications/ifip98.html>

Rameshsharma, W., S. B. Yu, B. Riedel, M. Burton, and G. Dimigen (2000). Constructing Sonified Haptic Line Graphs for the Blind Student: First Steps. available online at: <http://www.dcs.gla.ac.uk/~stephen/papers/Assets2000.pdf>

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(Braille Code)

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Linearity () -

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Character set -

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() (Nemeth Code)

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(Audio- Tactile Tablets)

(Tiger Printer)

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(Active Learning) (Experiential Learning) :
 . (Constructivist Learning)

. (Hartshron, R. and S. Boren, 1990, p. 1)

Practical)

Small) (Work Experience) (Work
(Individual Works Skemes) (Groups Discussions

(Brooks, J and M. Brooks, 1993, P. 104) "

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Concrete Manipulatives Materials :

.(Hartshron, R. and S. Boren, 1990, p. 1)

(Howard, P. et al, 1997) " "

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Algebraic Tiles :

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(Algebraic Tiles)

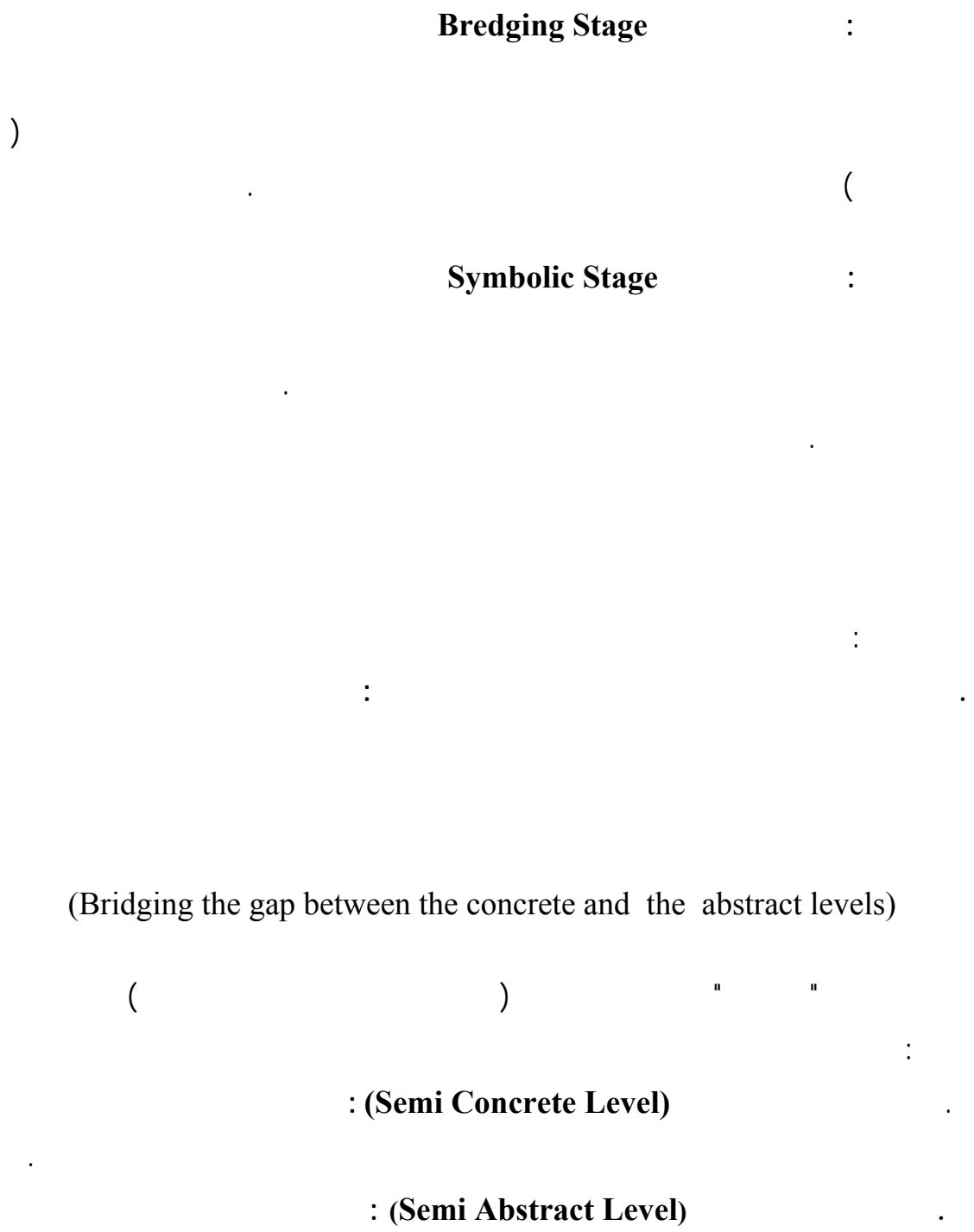
Manipulatives Materials :

Concrete Manipulatives Materials :

Digital Manipulatives Materials :

(Bohan, H. J. and P. shawker, 1998 , pp. 246 - 248) "

Concrete Stage



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(Hartshorn, R. and S. Boren, 1990, p. 1) .

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Cuisenaire Rods)

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(Patterns Blocks

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. (Resnick, M., et al, 1998)

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. (Resnick, M., et al, 1998)

(Piccotto, H., 1998 A)

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(Connections)

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(Grouws, D. .
(A. and K. J. Cebulla, 2000 A)

(Picciotto, H., 1998 B) " "

(Grouws, D. A. and K. J. Cebulla, 2000 B) .

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* انظر الدراسات والمشروعات البحثية السابقة .

