

The Cognitive Basis for an MR Image Tutor

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Abstract This paper describes the cognitive basis for an MR image tutor. The tutor is designed to help medical students learn to interpret MR images. The tutor is based on a model of the cognitive processes involved in interpreting MR images. The model is based on the work of experts in the field. The tutor is designed to help students learn to interpret MR images by providing them with a structured approach to the task. The tutor is designed to help students learn to interpret MR images by providing them with a structured approach to the task. The tutor is designed to help students learn to interpret MR images by providing them with a structured approach to the task.

Introduction

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Cognitive Support Systems

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p^f on o nn n o o p, - on v ppo v n o
n, v op n n o p, A n p, oon n on ED CA
o n v ppo f o p n C EC, o p o n p o
o^f p n o q n f o n o q p n;
o n on o^f o n v ppo p n , pp q o
o

n n v n o v :-
p ov ppo f o n n' o n on own n o^f p o
p , n p n ow o on-

o n v o n w o o^f n n ow v v n
o^f o n p n n n w n ow n , p ov n p o
o^f o p v n n n p on o p own n
v n n f o on n on v p o^f -

n n o f v , p f o n f w n o^f o op n
n w o^f n p n n n nn o po o o^f o n
wo. nv on n -

-no no on on v o n nn p n on n op on, o

Explain the terms to be used in labelling the concepts and their attributes (Stones, 1979)

o on D on v p ov o p n v o v op Bo
 v op n n p o o p o n nno v o n n o
 p n o on p po -A po on p n o v o p n n o
 p n on own n -An n p n n v on n f o p n n o
 nno p n - pp o o po n, n o f n o

ar n
 any s arp
 Gra
 ap
 oun
 Irr u ar
 Ar a sq
 Con or n to an anato a atur
 Int r, or patt rn
 Ho o n ous
 H t ro n ous
 Conta n a, st n t o a stru tur

E -A po on p D p on n n o pp n on

non p on n p pp op o o p o n, n p ov
 p n o v o n f p n n f o f o p n p
 n Bo , , po n n p n p n on p n p o o -
 , p o o n n o n n n o f o , n o

Provide a definition of each concept in terms of its critical attributes (Tennyson and Park, 1980)

C o on p n o n n o o
 o n v o o non - o o
 no n n n o f o n v n o n
 o p n on o n v p ov p o o
 n o pp op on-

Provide concept maps showing the relationships between concepts (Novak et al., 1983)

p nv n o n on p o o v n n ov v o
 o p n q o pon n n p ov p p o
 o pon n o n v o n on p n v n p - n o o
 v n n on o ov on o p n o o n p o
 own o n n p o o pon n n n p ov o v p o
 o n n n p o n n o n o v n -
 p ov v n n n n o n n n n on
 o n n o o p n ow f o o -A n p p o
 n ow o -An p o on ov v o p n n on
 ov v o v n n o p -

Start by showing a series of simplified exemplar images, with few and obvious attributes, to emphasise the critical attributes (Stones, 1979)

o v n on f po n f on / n on oo n on nno n
p n n on -

Arrange the exemplars in order from easy to difficult (Tennyson and Park, 1980)

An po n p o o n on n n ' n ' / n op
n op o n on o p n o on - o p o n n
own p on on v n o on o o v on
o vo A p op on on p n o n on v
p o n on o pon n n - 4-A
n on o p n on n o n o on on on on

Teach coordinate concepts by presenting examples according to their coordinate relations (Tennyson and Park, 1980)

Coo n on p o o ov pp n n n on f n on
p n n wo on on p o on n n n o on n n
o on p n no
o p n on n on on p n o on on on
v op n on n on on q n n p o n on
o p on on n on on ov v p o
o on on n on v p oo on on
q n on p on on n q no on on
no on on on on on v pp on n
n on on on on on on on on on on
v n v on on v -

Provide suitable cueing so that learners gradually become independent in their ability to identify novel exemplars of the concepts (Stones, 1979)

o n on p o ov pp n n n on f n on
pon o on -A n on o po n n n on on
f on n on v -A on on on on on on
n p oo o v Bo -

Implementation

o n n p n n on on on on on - on on on on
p o n on on on on on on on on on
n v on on on on on on on on on
o n on on on on on on on on on
v n p on on on on on on on on
o on on on on on on on on on
on on on on on on on on on on
v n on on on on on on on on
n on on on on on on on on on
n p o on on on on on on on
on on on on on on on on on on
on on on on on on on on on on
on on on on on on on on on on
A n n on p n on on on on

f n on q n n pon o o p n on ; , n v n on o n
A o v v p n o p on , o n o pon n o
p n -

Conclusions

D v op o p o n v p oo n on o n n v
n n on p oo n if o n- p n n n np oo n
o n on n n o o o on o nq o n on p , n p ov p
n o n o on o p n o o n n n n
pp o n n q n p on n pp o n o n
n n p p no o o n o pp o n o o p
o n o v on p , n oo , o n , n n o , n v n
p C p o o n Do on -
n v o on on p o n n n on o p ov n n o

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np D on n v o -
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- v , C-B- n o , E- C o o -*Annual Review of Psychology* , -
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w n o oo -*Science Education* , 4 -
- p , - n Bo , B- n o o o n B on -*Rivista di
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- p , - Goo , n on D v op n A n - n - *Technology
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- , D- o ED CA Co n v ppo o -*IMES Working Paper WP-6*,
n o o o o E ono o o n v u no-
- on , E- *Psychopedagogy*- n on on-
- , D- , B-A- , - Bo , G- , D- wo , - n G o , A-
Ev on o Co p A v o n n p on o C o -*Neuroradiology* , -
- , D- , B-A- p , - Bo , B- Bo , G- - 4 n n o n
o n o n C D -*Proceedings of Twelfth International Congress of the
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- nn on D- n , - n o Con p v w o n on D n -
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o n v ppo f o p n C EC, o p o n p o
o^f p n o q n^fo n^f o q p n^f;
o n on^f o n v ppo p n , pp q o
o
n n v n o v :-
p ov ppo^f o n n' o n on^f own n o^f p o
p , n p n ow o on-
o n v o n w o o^f n n ow v v n
o^f o n p n n n w n ow n , p ov n p o
o^f o p v n n n p on o p own n
v n n^f o on n on v p o^f -
n n o^f v , p^fo n^f w n o^f o op n
n w o^f n p n n n nn o po o o^f o n
wo. nv on n -
-no no on on v o n nn p n on n op on, o

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 p n on own n -An n p n n v on n p n n o
 nno p n - pp o o po n, n o f n o

ar n
 any s arp
 Gra
 ap
 oun
 Irr u ar
 Ar a sq
 Con or n to an anato a atur
 Int r, or patt rn
 Ho o n ous
 H t ro n ous
 Conta n a, st n t o a stru tur

E -A po on p D p on n n o pp n on

non p on n p pp op o o p o n, n p ov
 p n o o n n p n n v f o f o p p
 n Bo , po n n p n p n on p n p o o -
 , p o o n n o n n n o f o , n o

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 own o n n p o o pon n n n p ov o v p o
 o n n n p o n n o n o v n -
 p ov v n n n n o n n n n on
 o n n o p n ow o o -A n p p o
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 v o p on n n n p o o p on
 o on on n ov v p o o o ow
 q n wn o p o on n q no on o n
 no o o n ow v p ppo n -
 n o v n v po v o n v o o n
 v n v n v n v -

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o n o p ov o n ' o n n f o v ov v n
 pon o on -A n o p o n n n n
 v n n n f v p v oo p n n
 n n v -A v p ov n o o on
 n p o o o v Bo -

Implementation

o n n p n n n on o op o
 p o n nv on n nn n n X n ow on nwo on - ow n p o
 o o n on n n -
 n v no wo v v o ow n o v n f o n
 o n o -An ov v v p o
 v n p oo own ow on n n n o o po n
 o p -E pon n ov v n n q n n n on po n
 o n o v n on o o o on n
 v n n -
 n n o n o n ow o oo on o n o n n -
 n p o o pp n o n no p n n f o
 on o ov ov n o n on ov v v ow f
 n n p v o p on v n o n o n f
 v n on o v n on -
 A n n n o p n o p o n n n n

f n on q n n pon o o p n on ; , n v n on o n
A o v v p n o op on , o n o pon n o
p n -

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n n on p oo n if o n- p n n n np oo n
o n on n n o o o on o nq o n on p , n p ov p
n o n o on o p n o o n n n n
pp o n n q n p on n pp o n o n
n n p p no o o n o pp o n o o p
o n o v on p , n oo , o n , n n o , n v n
p C p o o n Do on -
n v o on on p o n n n on o p ov n n o

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