APPENDICES

A. MMA TRAINING MANUAL
B. ADDITIONAL TRANSPARENCIES
C. SUMMARY OF VIDEOS
D. TAPE LIST
E. READING LIST

DATA CORRELATION FORM

QUESTIONNAIRE LETTER
ENGLISH QUESTIONNAIRE
AFRIKAANS QUESTIONNAIRE

DEFINITION CRITERIA
SECTION F

II
DEFINITION CRITERIA
SECTION E
APPENDIX I:
QUESTIONNAIRE
27th March 1993

TO WHOM IT MAY CONCERN

THE MIND MAPPING APPROACH (MMA) TRAINING PROGRAMME: A CONSULTATIVE FRAMEWORK FOR TEACHERS AND THERAPISTS WITHIN THE SOUTH AFRICAN CONTEXT

As a doctorate student in Speech-Language Pathology, I am currently busy with a research project evaluating the effect of the MMA training programme in schools and therapeutic institutions.

The aim of the MMA training programme is to empower teachers and therapists to incorporate the whole-brain learning concept of the MMA into the classroom/therapy room, in this way reaching large sectors of the S A population.

It would be very much appreciated if you would fill in the attached questionnaire before the course begins. In return, I will statistically evaluate the effect the MMA programme has on your pupils/clients academic results providing you with a report thereof at the beginning of 1994.

With sincere appreciation for your co-operation.

Yours sincerely

CAROLINE LEAF

PROFESSOR I C UYS
HEAD: DEPARTMENT OF SPEECH PATHOLOGY AND AUDIOLOGY
UNIVERSITY OF PRETORIA
QUESTIONNAIRE

SECTION A: BIOGRAPHICAL DATA

NAME ________________________________
AGE ________________________________
SEX ________________________________
QUALIFICATIONS ______________________
YEARS OF EXPERIENCE __________________
PRESENT POST HELD ______________________
NAME OF SCHOOL/ INSTITUTION WHERE EMPLOYED ________________________________
REPETITION NUMBER ____________________

SECTION B:

The following questions probe the academic learning process in school and therapy situations. There are no right or wrong answers. Please select what you feel to be the most appropriate answers according to your experience. Please mark an X in the selected column.

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OFFICE USE ONLY

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V2 [ ] 4-5
V3 [ ] 6
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V5 [ ] 10-11
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V7 [ ] 14-15
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V9 [ ] 17
V10 [ ] 18
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V14 [ ] 22
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V18 [ ] 26
11. Would music, in your opinion, influence the learning situation?  
12. Would different types of music have different effects on the learning situation?  
13. Would a person's mental approach to reading and studying influence learning?  
14. Would reading fast reduce the comprehension of the material being read?  
15. Would rereading words within a sentence improve comprehension of the material being read?  
16. Does following with one's finger while reading improve comprehension of the material being read?  
17. Is making notes while learning important to memory?  
18. Do you think that the more creative right hemisphere plays a role in the academic learning process?

SECTION C:

The following section also probes the academic learning process in schools and therapy situations. Please select what you feel in your opinion to be the most appropriate answer by marking an X in the selected column.

1. How much do you know about how your eyes move whilst reading and how this knowledge can be used to your advantage?  
2. Do you know how to teach your eyes to take in more information than they normally do?  
3. How aware are you of the chemical effects of certain foods on the learning process in the brain?  
4. How much do you know about the nature of comprehension and how this can be improved?  
5. How much do you know about note-making techniques that enable you to form "mental-pictures" of your thoughts?  
6. How much do you know about the nature of key concepts as opposed to key words, and how they relate to note-making and imagination and learning?  
7. How much do you know about creativity?  
8. How much do you know about the potential of the average brain's creativity?  
9. How much do you know about the differences between the functions of the left and right hemispheres of the brain?
**SECTION D:**

The following is a list of characteristics of learning. According to your experience, how would you rate their relative importance in the teaching / learning environment?

1 = of no importance  
2 = of some importance  
3 = of great importance  
4 = of very great importance

1. The learning environment must be quiet and serious
2. Learning requires great effort and hard work.
3. The good student must try his best and compete well.
4. Some subjects / concepts are extremely difficult to learn.
5. Concentration by sitting still in a quiet room with no distractions is important.
6. Art and music aid the learning process.
7. Imagination, intuition and playfulness are important in the class-room.
8. Logical and ordered teaching and learning is important to the academic learning process.
9. Feelings and random associations are part of teaching / learning.
10. Laughing, playing and joking can be good breaks from difficult tedious lessons.
11. Games, jokes, fun, are part of the class-room teaching process.
12. Academic learning should be easy and fun.
13. Learning comes more easily to some.
14. The teacher is most important to the learning process.
15. Co-operative learning between teacher/therapist and pupil / client is necessary.

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SECTION E:

Please define or describe the following concepts according to your experience.

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SECTION F:

Please answer the following questions in as much detail as possible.

1. Have you managed to implement the concepts of the Mind-Mapping approach in your daily teaching curricula or therapy? If yes, indicate how e.g., "Music - used daily
   Mind-Maps - teach Biology using these, etc."

2. Have you experienced any difficulty using the concepts of the Mind-Mapping approach? If yes, specify which and how.

3. Do you feel that your pupils/clients have benefitted from the concepts of the Mind-Mapping approach - how e.g., "using Mind-Maps as a study method - definite improvement in marks" etc.

4. Any additional comments.
## VRAELYS

### AFDELING A: BIOGRAFIESE GEGEWENS

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<td>HUIDIGE POS</td>
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<td>NAAM VAN SKOOL/WERKGEWER/INSTELLING</td>
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### SLEGS VIR KANTOORGEBRUIK

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## AFDELING B:

Die volgende vrae peil die akademiese leerproses in skool- en terapiesituasies. Daar is geen regte of verkoerde antwoorde nie. Kies, op grond van u verworwe ervaring, asseblief die antwoord wat na u mening die toepaslikste is deur 'n X in die toepaslike kolom te trek.

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<td>Is dit nodig dat studente/kliente weet hoe geheue werk om hulle leervaardighede te kan verbeter?</td>
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<td>Is dit nodig dat studente/kliente verstaan hoe geheue werk om hulle geheue te kan verbeter?</td>
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<td>Die meerderheid studente weet heelwat van hoe om te dink, te skep en gevolgtrekkings te formuleer.</td>
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<td>Akademiese sukses verg uitsers harde werk.</td>
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<td>Werk en presteer 'n mens beter onder druk?</td>
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<td>Die herhaalde deurlees van mens se werk is memorisering en leer.</td>
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<td>8</td>
<td>Alle studente het op alle akademiese gebiede 'n gelyke kans op sukses.</td>
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<td>9</td>
<td>Sal ontspanne wees die akademiese leerproses bevorder?</td>
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<td>10</td>
<td>Benut die deursneepersoon, na u mening, beperkte breinpotensiaal vir die akademiese leerproses?</td>
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### Afdeeling C:

Die volgende vrae peil ook die akademiese leerproses in skool- en terapisituaasies. Daar is geen regte of verkeerde antwoorde nie. Kies die antwoord wat na u mening die toepaslikste is deur 'n X in die toepaslike kolom te trek.

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AFDELING D:

Die volgende is 'n lys leerkenmerke. Wat-
ter waarde sal u, op grond van u verworwe ervar-
ing, aan hulle relatiewe belangrikheid in die
onderrig-/leeromgewing toeken?

1 = van geen belang nie
2 = matig belangrik
3 = baie belangrik
4 = uitsers belangrik

1 Die leeromgewing moet stil en stemmig wees.
2 Leer verg baie inspanning en harde werk.
3 Die goeie student moet sy bes probeer en
good meeding.
4 Sommige vakke/begrippe is uitsers moeilik om
te bemeester.
5 Konsentreer deur stil te sit in 'n stil kamer
sonder enigiets wat 'n mens se aandag aftrek,
is belangrik.
6 Kuns en musiek help die leerproses aan.
7 Verbeelding, intuisie/aanvoeling en spelerigh-
ed binne die klaskamer is belangrik.
8 Logiese en geordende onderrig en leer is be-
langrik vir die akademiese leerproses.
9 Gevoelens en willekeurige assosiasies is deel
van onderrig/leer.
10 Gelag, spelery en grappe kan 'n welkome
blaaskans tussen moeilike, vervelige lesse
bied.
11 Speletjies, grappies en pret is deel van die
klaskameronderrig-situasie.
12 Akademiese leerdery behoort maklik en pret-
tig te wees.
13 Sommige mense leer makliker as ander.
14 Die onderwyser is baie belangrik vir die leer-
situasie.
15 Koöperatiewe (samewerkende) leerwerk tussen
onderwyser/terapeut en leerling/kliënt is
noodsaaklik.
AFDELING E:

Omskryf of beskryf asseblief die volgende begrippe aan die hand van u verworwe ervaring:

Leer

Geheue

Visualisering

Versnelde leer

Superonderrig

V52 1-3

V53-57 4-8

V58-62 9-13

V63-67 14-18

V68-72 19-23

V73-77 24-28

V78 59
APPENDIX II: SECTION E DEFINITION CRITERIA

A LEARNING
- RECONCEPTUALIZE
  - RECONSTRUCTION
    - Original concept
  - TYPES
    - CONTEXTUAL
      - (episodic)
      - 90% learning
    - SEMANTIC
      - (content)
      - Rote
      - 10% learning
  - STM + LTM
  - ELECTRICAL-CHEMICAL REACTION
    - organisation
    - association

B MEMORY
- ENHANCED

C VISUALISATION
- senses
- recreate
- creates meaning
- = preparation
- accesses information

D ACCELERATED LEARNING
- stress
- natural
- MMA
  - Geodesic approach
  - multiple intelligence

E SUPER-TEACHING
- Joy!
- Facilitators
- Use geodesic methods
- Create geodesic environments

Process of learning

by reorganisation
from external + internal sources

RECONCEPTUALIZE
- different
  - intelligences
  - learning styles

ENVIRONMENT
- Authentic
- Emic
- Ethnographic

PROCESS
- Internally
  - Regulated
  - Motivated
  - Simultaneous
  - Multimodal
  - Dynamic
APPENDIX III: SECTION F
DEFINITION CRITERIA

F1:
- English
- Afrikaans
- Maths
- Biology
- Science
- Geography
- Business Economics
- Accountancy
- History
- Environmental Studies
- Health
- Therapy Activities
- Music
- Relaxation
- Study Method + Method

F2:
1. New teaching and learning system
2. Organisation
   - Creativity
   - Understanding
   - Problem-solving
3. Conceptualizing
   - Summarising → main ideas
   - Associating
4. Relaxation
   - Music
5. Study-method
   - Memory

F3
F4

Same as F2

NOTE
APPENDIX IVA:
MMA MANUAL
MMA TRAINING AGENDA

1. Gun
2. Law
3. Reading
4. Introduction
5. Right-mode drawing
6. Preparation
7. Laws of mind-maps
8. Jigsaw puzzle
9. Reading
10. Brainstorming
11. Review
12. Mnemonics

SUMMARY

PROGRAMME ONE

PROGRAMME TWO

PRACTICAL SESSION

1. Enchanted loom

MMA OPENS THE DOOR TO YOUR BRAIN POWER

Copyright C. Leaf 1992
Specialisations of the Left and Right Brain
Upside-down Drawing

Learning To Experience The Right Mode

The figure is a reproduction of a line drawing by Picasso, of the composer Igor Stravinsky. The image is upside-down. You will be copying the upside-down image. Your drawing will therefore be upside-down.

☐ You have ± 20 minutes in which to complete the drawing.

☐ Do not turn the drawing right side up until you are finished, this will cause you to shift back into the left mode.

☐ Look at the upside-down drawing for 1 minute.

☐ Now start drawing, begin at the top, copying each line, moving from line to line. Don't name things, ie hands etc. Just copy the lines.

☐ Once you have started drawing, you will find yourself becoming very interested in how the lines go together — your left hemisphere will switch off as the task is too slow and it is too hard to recognise anything. Your right mode will be working.
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Laws of Mind Maps

LAW 1.
- Centre
- Multi Coloured Image
- Symbol
- Title

LAW 2.
- Main Themes
- Attached Central Image

LAW 3.
- Lines
- Connect
- Lines

LAW 4.
- Print
- Photographic Feedback

LAW 5.
- Words on Lines

LAW 6.
- Single

LAW 7.
- Colour

LAW 8.
- Perfect Memory

LAW 9.
- b4 = before

CONCEPTS
- Images
- Single
- Per Line
JIGSAW PUZZLE

1. OVERVIEW
   "WARM UP"

2. PREVIEW
   5-10min

3. INVIEW
   EVERY NB WORD
   Simultaneous Action

   For Concepts

   Mind Map

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A graph showing the benefits of properly spaced reviews

1st review
10 minutes

2nd review
24 hours

3rd review
1 week

4th review
1 month

5th review
6 months

CREATIVE THINKING

long term memory

amount recalled

area of maintained knowledge after 10 minutes

area of maintained knowledge after 24 hours

area of maintained knowledge after 1 week

area of maintained knowledge after 1 month

passing time

area of maintained knowledge for person who does not review
75-100% Recall

25-33% Recall

10min 1day 1week 1month
1st Review 2nd 3rd 4th 5th
3m’s

90-100% Retention with Breaks

1hr 1hr 1hr
10min Break 10min Break 10min Break

30-40% No Breaks

Make your work Come alive!!!

1. Creative Visualisation
2. Teach Explain

"Man from Mars"
"Teddy Bear"
Anything!!!

Writing

Memories

Memory Aids

Stories

Place

Number

Rhyme

Shoe

2-2

Fun

Exaggerated

Unique

Silly

Funny

Principles

Mnemonics

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Mnemonic Systems

Front Door 1
Entrance Hall 2
Lounge 3

Place

Number

1 1 2
3 3 4
5 5 6
7 7 8
9 9 10

Rhyme

1 - Gun
2 - Shoe
3 - Tree
4 - Door
5 - Hive
6 - Sticks
7 - Heaven
8 - Gate
9 - Line
10 - Pen

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SUMMARY OF THE APPLICATION OF THE MMA

1 Music is played throughout to create an optimimal learning situation.

2 Each session begins with physical and mental relaxation, to literally "deblock" the learning barrier.

3 A relaxed, informal, happy atmosphere is created.

4 The art of direct and indirect suggestion is used.

5 Whatever material is being worked on, is presented as dramatically as possible, using the senses and visual imagery.

6 During therapy/teaching/learning,

- words are read aloud. This activates Broca's area, Wernicke's area, the left hemisphere sensory and motor cortex, and the angular gyrus.

- text is read with emotion and inflection. This activates right hemisphere areas for prosodic functions, the right motor and sensory cortex, and the limbic system.

- pictorial images are developed and mind-maps used (see programmes). This involves a major portion of the primary visual cortex, the left and right motor sensory cortices and the central and peripheral nervous systems from the brain stem through the arms, hands and fingers.

- key words are used on mind-maps, encouraging the client to tie the words to a pictorial memory, thus activating the right hemisphere.

- colour-coding is used on mind-maps, allowing discrimination in the right visual cortex and to activate memory.

- role-play with music, is encouraged, to activate the left and right motor and sensory cortices, the brain stem and the central and peripheral nervous system.

7 Reviews are done using relaxation techniques, and also Baroque music, which, lowers beta rhythms 13.30 cycles per second within the left hemisphere, allows increased alpha rhythms (8-12 c.p.s) in both hemispheres, impacts the limbic system components controlling emotion and memory, and works to lower blood pressure, heart rate and respiratory rate.

8 Testing is done after a review, using mind-maps. This reinforces neuronal connections established during initial learning, leading to hypertrophy and/or branching of neuron dendrites, making recall easier.
The more vivid and active the impression of what is being learned, the stronger the memory trace. The spike of electrical activity in the brain increases markedly with novel, surprising or vivid stimuli. This activity signals the hippocampus and hypothalamus to produce increased levels of neurochemicals related to memory formation.

THE MMA PROGRAMME ONE:
LANGUAGE AND LEARNING DISABILITY

SECTION A: BACKGROUND - STORY ANALYSIS
(Adapted from Wallach & Butler)

1 SETTING
Main Characters
Social, physical, temporal context

2 EPISODES
2.1 Beginning - the initiating event, which could be:-

❖ a natural occurrence. eg - a flood.
❖ an action. eg - three pigs leaving home.
❖ an internal physical state. eg - hunger, pain, sickness.
❖ a perception of an external event. eg - seeing a lion.

2.2 Reaction of the characters to the initiating event. This is normally the internal response that is determined by cultural experience and personal attributes. The internal response can be emotion (feeling or desire) or thinking (planning how to deal with a problem)

2.3 Action - The attempt (overt action) to deal with the initiating event.

2.4 Consequence/outcome - which could be:-

❖ a natural occurrence. eg - the rain stops.
❖ an end state. eg - marriage.
❖ an affective response. eg - They lived happily ever after.
❖ an idea. eg - has a new friend.
❖ an action. eg - riding off into the sunset.

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3. WORLD KNOWLEDGE/VIEWS

The following concepts are needed in order to be able to tell and understand stories. They are the starting point.

- linguistic knowledge
- rhetorical knowledge (prosody, proverbs, poetic)
- causal conceptual (lectures, expository)
- intentional conceptual (narrative)
- spatial knowledge

knowledge of:
- objects
- personalities
- roles

| equilibrium → transition → disequilibrium = sad stories |
| disequilibrium → transition → equilibrium = happy stories |

4. IMPORTANT AGES IN STORY DEVELOPMENT

4.1 ± 3 years
- recognise that a story is different from conversation.

4.2 ± 4-5 years
- aware actions originate around events.

4.3 ± 6 years
- expand the above idea to include mediating thoughts, actions, events.

4.4 ± 11 years
- understand/use embedded episode.

4.5 ± 12 years
- multiple embedded episodes.

SECTION B: STEPS

STEP 1 PRESENTATION LEVEL

1.1 Read story/section of work/newspaper article etc, to client. If the content is long, stop after each episode and ask a factual question (explicit level). eg “Who was that about?” or “What have we just read?”

NOTE: If the client can’t formulate an answer, summarise the content and ask the question again.

Aim of Step 1
- listening skills
- attention
- comprehension
- memory

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STEP 2  DIAGNOSTIC LEVEL

2.1   The client now retells the story/article/school-work etc.

NOTE: Do not help via probes, questions etc, as this is on a diagnostic level.

For remedial therapeutic purposes, record and transcribe content for analysis and comparison, as well as to get an indication of: language level, types of errors, recall/memory, sequencing abilities and logic.

Aim of step 2
✓ diagnostic
✓ assimilation and accommodation
✓ encoding and decoding

STEP 3  EXPLICIT LEVEL

3.1   Ask factual questions (explicit level), ie who?, what?, when?, in order to establish the factual content and sequence of the story/article etc, in the client.

NOTE: No inference/insight questions are asked at this level.

Explain meanings of new words - provide practice (semantics)

Aim of step 3
✓ sentence formation
✓ word finding - semantics
✓ vocabulary - semantics
✓ comprehension
✓ memory
✓ categorisation

STEP 4  RETELLING LEVEL/PRACTICE STAGE

4.1   The client retells the story for the second time.

NOTE: For remedial therapeutic purposes, probes can be used but, note how many, as one aims to decrease the amount of probes used as a criteria for success in therapy.

Make sure the patient has grasped the content of the story/article etc.

Aim of step 4
✓ memory
✓ sequencing
✓ sentence formation
✓ comprehension

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STEP 5

IMPLICIT LEVEL

5.1 Now ask the insight/deep questions, ie Why?, how?, what for?, What do you think?, What does it mean?, What would happen if...?, What is another title for the story?, Give reasons for.....etc.

Aim of step 5

- cause/effect
- inference
- implications
- metalinguistics - identification and discussion of:
  - metaphor, simile, figurative language, use of expansion techniques, use of punctuation for effect etc.
- metacognition - thinking about thinking/internal plans eg:
  
  “Why did the author imply...?”
  “Why did the little girl tell stories?”
  “What were they feeling?”
  “What do you feel when you read this story?”

- reasoning, thinking, problem-solving, judgement:
  
  on a verbal level - later with mind-maps.

INDUCTIVE & DEDUCTIVE & ANALOGICAL REASONING  ↓
CONVERGENT & DIVERGENT THINKING  ↓
PROBLEM SOLVING & JUDGEMENT

NOTE: For remedial and language therapy specifically: From steps 2-4 various grammatical errors should have been noted. At this level these errors can be worked on using the content of the story as the material for therapy. Extra practice of linguistic structure with additional material can be used as well, thus errors are noted as they occur and worked on throughout therapy.

NOTE: For auditory perceptual training: This is worked on simultaneously, directly or indirectly, as errors occur, throughout therapy.

STEP 6

MIND-MAPPING

6.1 Only now is the client ready to mind-map the story. Select the type of mind-map to be done according to the age of the client.

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THE MMA PROGRAMME TWO: CARRY OVER INTO THE CLASSROOM

TYPES OF MIND-MAPS

1 Pre-School, Grade One, Grade Two, 1st terms (± 5-8 years)
   Can have up to 5 episodes in the body, depending on what the client can cope with.

2 Grade Two 2nd term (± 8-9 years)
   There can be as many episodes as the client can cope with.
   Words can be brought in at this stage.

3 Standard one onwards, mind-mapping proper is done.
   See Jigsaw puzzle and Laws of Mind-maps overleaf.
HOW TO TEACH MIND-MAPPING

Show the client a few mind-maps, explaining the rules simultaneously.

Now do the first mind-map, with the client following on the story or article that is been worked on. While doing the mind-map discuss how you are fulfilling the rules. Adjust the language used to the level of the client.

Once the mind-map is completed, go through it cloud, by cloud.

Let the client retell the mind-map. Use probes if necessary.

The client must practice retelling until he/she can do it without help. This practice familiarises the client with the concept of mind-mapping.

Now let the client draw his/her own mind-map of the story, without copying the one you have done. Help with the memory of facts/content of the story, as the emphasis here is on the creation of a mind-map, and not memory.

(1-6 can be covered in 2-5 half hour sessions)

NOTE: Key concepts can pose a problem. If this appears to be the case, it is advisable to spend a few sessions working on key concept selection. When explaining what a key concept is, the following is often helpful:

Level one: \textbf{EVERY WORD} \ \\

Level two: \textbf{KEY WORD} \ \\

Level three \textbf{KEY CONCEPT} \ \\

eg: The cat sat on the mat.

eg: cat sat on mat

eg: cat $\Rightarrow$ mat

See overleaf - mind-maps for key concept practice.
You can use the following mind-maps to do key concept practice:

1 FEATURE ANALYSIS GUIDE

This feature analysis guide not only improves key concept selection, but also categorisation, association, clustering and organisation (a cognitive skill).

2 SUN DIAGRAM

The Sun Diagram can also help with the analysis of the story, but the client must be encouraged to develop his/her own mind-map of the story, with his/her own creative structure as this one is still very linear and boring.
7 Using a new story, go through steps 1-7. Now get the client to create his/her own mind-map. Help where necessary.

NB!
As the client becomes more familiar with the method, decrease help gradually until the student can do a mind-map on his/her own. Once this is achieved, go onto a more complex story/article etc.

NOTE: IMPROVEMENT OF LANGUAGE USE:
This involves working on: a) **Pragmatics** - dyad, turn-taking, topic-maintenance, listening, eye-contact.

b) **Transactional analysis** - the quality of what the patient is saying on a conversational level.

c) **Communicative functions** - informing, controlling, persuading, expressing, feelings, ritualising, imaging.

All these can be assessed and analysed constantly, throughout, as mind-mapping therapy uses functional discourse, ie narration, conversation and procedure, as its basic material. Mind-mapping therapy also works extremely well in group set ups, providing the ideal environment for assessing and remediating a,b,c.
THE SUGGESTED MMA PROCEDURE IN THE CLASS-ROOM

1. Baroque music and relaxed atmosphere.
2. Physical relaxation exercises.
3. Mental relaxation exercises (visualisation).
4. Presentation of lesson using as much of a story text as possible.
5. While presenting story, do mind-map on blackboard - simultaneous presentation.
6. Go through mind-map.
7. Get the students to retell mind-map, taking turns.
8. Remove mind map from the board, write down lesson information on the board in point form - or present on an overhead projector. Help the students select the correct key words.
9. Now for the classwork activity, they must each make their own mind-maps.
11. Next lesson begins with going over mind-maps, using quiz games etc.

NOTE: Present the techniques of mind-mapping in a story form first, before applying to school lessons.

Teach Jigsaw puzzle to students as a lesson in guidance.
SAMPLE MIND-MAP

Cinderella
adapted from Tony Buzan
Here is how a child might envision the classic story of Cinderella.

This is an example of how Mind-Maps can be used by all ages and occupations, to describe an infinite variety of subjects.
Summary
1. **Habitat:** Most frogs are land animals, but some kinds never leave the water. The eggs are laid in the water and the tadpole is aquatic.
2. **Body division:** Head and trunk.
   (a) **Head** with:
       - wide mouth; row of teeth in the upper jaw; long, sticky tongue attached to the front of the mouth;
       - two protruding eyes with nictitating membrane;
       - two nostrils for smelling and breathing;
       - two round eardrums for hearing and balance.
   (b) **Trunk** with two short forelegs and two large hindlegs with webbed toes.
3. **Body shape:** Short, flattened from top to bottom; no neck and a hump on the back.
4. **Body covering:** Moist, naked skin with mucous glands and pigment-cells.
5. **Locomotion:**
   (a) Jumps with hindlegs on land.
   (b) Swims in water with hindlegs and webbed toes.
6. **Breathing:** The adult frog breathes through his lungs, mouth and skin.
7. **Reproduction:** Oviparous. Lays eggs in water where they are fertilised externally. Tadpoles with suckers and external gills hatched by means of the heat of the sun. They develop into tadpoles with a mouth, eyes and internal gills. Hindlegs appear later and then the lungs develop. The front legs appear and the tail disappears. This change of shape is called metamorphosis.
THE ART OF WRITING (Egyptians)

As long ago as 3000 B.C. the Egyptians developed a form of writing by drawing pictures to represent objects. The great disadvantage of picture-writing is that it is usually clumsy and takes a long time to write. Eg. this mountain and sun

However, it was often necessary to refer not to a thing but to an idea, and so conventional signs were used to convey ideas: called Ideograms.

Head + Body = Man
Mouth
Bowl = Food

Head with Mouth + Bowl = Eating
Stream of Water
Head with Mouth + Water = Drinking

A later development was the use of signs with certain sounds to form words. These we may call Phonograms, eg. the picture of a bee and a leaf could be used to convey the idea of a "belief". This was phonetic writing and became very difficult to interpret when the meaning of the picture was lost.

Egyptian writing had over 600 signs. This writing in its earliest form was called "hieroglyphics" which means "holy writing" because it remained the secret of the priests who used the symbols on tombs and monuments and in the temples. Later a simplified form was developed - called "demotic". Finally an abbreviated form called "hieratic" evolved.

Upper line: Hieroglyphics - picture-writing
Lower line: Demotic writing - a running hand

The writing materials first used were surfaces, pieces of pottery and bone, but later they discovered they could make paper by splitting a river-reed, called papyrus, into thin strips which were pasted together to form large sheets. They made ink by mixing soot and water. A pointed reed was used as a pen.
APPENDIX IVB:
ADDITIONAL TRANSPARENCIES
"What today would be impossible to do in your business/profession but if it could be done, would fundamentally change the nature of what you do!"

Those who say it cannot be done should get out of the way of those who can!

DEFINITION:
PARADIGMS =
1:
Sets - rules + regulations
See what we want to see
Affect judgements + decisions
Going back to zero
Past success guarantees nothing

APPENDIX IV C
PARADIGM RULE:

PARADIGM PRINCIPLES:
1. Common
2. Useful - help focus
   - help identify problems
   - give rules - solve problems
3. Problem = "THE" Paradigm =
   PARADIGM PARALYSIS ---- } new ideas
   = threats
4. Found "AT THE EDGE" - Outsiders
5. Paradigm - Pioneers ---- courage
6. YOU can CHOOSE!
## APPENDIX IVD : MUSIC TAPE CATALOGUE

### A  General Relaxation and Imagery

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<td>Spectrum Suite</td>
<td>-</td>
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<td>Angelic Harp</td>
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### C  Awakening / Stimulation

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<tr>
<th>Sun Singer</th>
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<th>Paul Winter</th>
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<tr>
<td>Shadowdance</td>
<td>-</td>
<td>Shadow Fax</td>
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### D  Learning & Listening

| Cosmic Classics           | - | Don Campbell |

### E  Baroque Music for Accelerated Learning & Relaxation

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<tr>
<th>Music for Imaging</th>
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<tr>
<td>Romantic Interlude</td>
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<td>Relaxing with the Classics Vol I</td>
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<td>Relaxing with the Classics Vol II</td>
<td>-</td>
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<td>Largos &amp; Adagios</td>
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<td>Andante</td>
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### F  Music for Kinesthetic Imagery

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<th>Lightening on the Moon</th>
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<td>Symphony for the Inner Self</td>
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APPENDIX IV: READING LIST

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E. Jensen, 1988
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C. Leaf, 1993
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Bloom, L. & Lahey, M. 1978

Boller, K. & Rovee-Collier, C. 1992

Borkowski, J.G., Schneider, W. & Pressley, M. 1989

- 268 -
<table>
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<th>Year</th>
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<td>Enchanted Loom</td>
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Jensen, E. 1995 Brain-Based Learning and Teaching. South Africa : Process Graphix

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<th>Year</th>
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<th>Journal/Source</th>
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<td>Feuerstein, R.</td>
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<td>Goodman, K.S.</td>
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<tr>
<td>Kintsch, W.</td>
<td>1980</td>
<td>&quot;Learning from Text, Levels of Comprehension, or: Why Anyone would Read a Story Anyway&quot;</td>
<td>Poetics, 9, pp. 87-98.</td>
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<th>Author(s)</th>
<th>Year</th>
<th>Title</th>
<th>Publisher/Editor</th>
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<tr>
<td>Odendaal, M.S.</td>
<td>1985</td>
<td>“Needs Analysis of Higher Primary Teachers in KwaZulu” in <em>Per Linguam</em>, Special Issue No.1, pp. 5-99.</td>
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