

Does Music and Dance Construct Bridges in the Brain to Enhance Learning?

Pilot longitudinal study

Since 2008, the Gait, Arms, Legs and Spine (GALS) Screening Tool is taught to Year one undergraduate medical students at James Cook University (JCU), as part of the clinical skills Musculoskeletal (MSK) examination. ‘GALS’ is a sequence of concise movements that assesses the range of motion of the major joints of the body.

The strategies of small group teaching, instructional video, practical demonstration and simulated volunteer patients are utilised to teach ‘GALS’ in the two hour workshop. Written and audio visual resources are available to the students on JCU’s online learning platform. Post workshop, students are assessed in an OSCE style assessment.

With the dual intention to enhance student learning, and improve short and long term recall, educators created a ‘GALS music and dance’ video.



Principles and processes
Hear the music – ‘Moves like Jagger’; Remember the dance - ‘GALS’ sequence

NEURONS THAT FIRE TOGETHER WIRE TOGETHER

NEUROSCIENCE

Brain plasticity enables learning through neural remodelling
Learning is enhanced when:

- The stimulus is unique
- The limbic system is engaged
- Different areas of the brain are simultaneously activated
- The skill is repeated

MUSIC - Auditory
Rhythm and melody trigger memory through horizontal and vertical processing in the brain. The left hemisphere processes rhythm and sequence while the right hemisphere stores melody (Berk, 2008).
The cerebellum processes rhythm; the temporal lobe computes melody; and the frontal lobe analyses the lyrics.
PRINCIPLES:

- Music must be meaningful and appealing (Berk, 2008)

Students consulted with music choice

- Rhythm and melody must match GALS sequence (Berk, 2008; Matlock et al., 2008)

‘Moves like Jagger’

- Song choice must not be offensive (Berk, 2008)

Negative emotion inhibits learning

Outcomes and future directions
Longitudinal study – two years Comparing results obtained:
Control Group (Year 1 Cohort 2010) and Intervention Group (Year 1 Cohort 2012)

Short Term Recall Results (2012 cohort)

Watching EITHER the instructional video or the ‘GALS music and dance’ video increased the likelihood of passing the OSCE assessment.

Interim Long Term Recall Results (2010 Cohort)

- On average, students documented half of the possible elements of the ‘GALS’ sequence.
- 58% reported less confident in their knowledge two years post teaching compared to immediately post workshop

DANCE - Kinaesthetic
Movement is an effective cognitive strategy to improve recall (Jensen, 2005).
PRINCIPLES:

- Student ownership enhances learning

Students assisted with choreography and video production

- Repetition makes permanent

‘GALS music and dance’ video is available to students when and where they wish

VIDEO PRODUCTION
Auditory, visual and kinaesthetic pathways are engaged strengthening memory (Brewer, 1995).
PRINCIPLES:

- Short and novel
- Focus on details of ‘GALS’ sequence



FUTURE DIRECTIONS

- Continue evaluation and modify teaching
- Continue data collection
- Evoke emotions- students dance the ‘GALS’ sequence in the workshop



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