

Culturally Responsive Pedagogy

Social Justice, Numeracy and EAL/D Students

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Culturally Responsive Pedagogy (multicultural teaching)

Socially Just Pedagogy

- all students having equitable opportunities to learn (e.g. bilingual/translanguage access)
- all students having equal access to education resources (e.g. internet access)
- address socio-political issues relevant to EAL/D students (e.g. poverty, higher education opportunities)

Social Justice Pedagogy

- pedagogy that highlights liberation from oppression
- critical agency - the power to challenge, evaluate and change socio-political issues that influence students' lives
- critical numeracy

How do we incorporate CRP into the Australian (Mathematics) Curriculum?

- **General Capabilities**

- *Numeracy*
 - Interpreting statistical data
- *Critical Thinking and Creativity*
 - interpreting, analysing, evaluating, explaining, sequencing, reasoning, comparing, questioning, inferring, hypothesising, appraising, testing and generalising
- *Ethical Understanding*
 - equality, respect, fairness, empowerment, fair play, equitable participation, inclusivity, human rights, justice, right and wrong, freedom, truth, identity, goodness

- **Socially just teaching practices**

Culturally sensitive

Age-appropriate curriculum

Bilingual

Task-based learning

Communicative approaches

Collaborative learning

Inclusive – community involvement

Relevant issues

Previous experiences

Mixed ability groups

- **Social Justice through mathematics**

- *Critical Numeracy*

Critical Numeracy

- Social justice approach to teaching numeracy where marginalised students are encouraged to **challenge** and **change** established social and political practices through the numerical analysis of issues that are relevant and important to their standing in society (Skovsmose and Greer, 2012).
 - Grounded in Critical Theory
 - Emancipatory
 - Empowering
 - Access to mainstream mathematics and numeracy (Gutstein, 2012)
 - Informal
 - Functional
 - Higher-order
 - Critical
 - Implemented through Critical Numeracy Four Resource Model (Watson, 2009)

Literacy Four Resource Model

<p>CODE-BREAKING resources or CODING PRACTICE</p> <p>How do I crack this code?</p> <p>The emphasis is on decoding and encoding the codes, symbols and conventions of written, spoken, visual and multimodal texts in response to contextual factors which includes:</p> <ul style="list-style-type: none"> • recognising and using the alphabet, sounds in words, whole words, letter/sound relationships • using graphophonic, syntactic and semantic sources of information • spelling accurately and understanding the functions of spelling • recognising and using grammar and vocabulary including punctuation and intonation and rhythm • recognising and shaping patterns of letter, sound, word, clause, sentence and text/generic structure • recognising and shaping visual, nonverbal and auditory codes 	<p>TEXT PARTICIPATING resources or SEMANTIC PRACTICE</p> <p>What does this mean to me?</p> <p>The emphasis is on comprehending and composing or making meaning from written, spoken, visual and multimodal texts which includes:</p> <ul style="list-style-type: none"> • drawing on social and cultural background and prior knowledge to construct meaning from texts • comparing own social and cultural experiences with those described in the text • relating previous experiences with similar texts • seeing own interests and lifestyles reflected in texts • interpreting and using literal and inferential meanings in texts • attending to the way texts are constructed to make meaning • recognising and constructing concepts and processes that characterise different ways of constructing knowledge in text
<p>TEXT-USING resources or PRAGMATIC PRACTICE</p> <p>What do I do with this text?</p> <p>The emphasis is on understanding the purposes of different written, spoken, visual and multimodal texts and using texts in different ways for different cultural and social functions which also includes:</p> <ul style="list-style-type: none"> • understanding that different cultural and social contexts and purposes shape the way texts are structured • understanding the purpose of a text and recognising the purpose in using it • using appropriate text types for particular purposes both inside and outside school • recognising what to do with a text in a particular context and what others might do with it • recognising that each text type has particular structures and features • understanding the options and alternatives for using a text to convey particular meanings effectively. 	<p>TEXT-ANALYSING resources or CRITICAL PRACTICE</p> <p>What does this text do to me?</p> <p>The emphasis is on understanding that written, spoken, visual and multimodal texts are not neutral but represent particular points of view and silence others which includes:</p> <ul style="list-style-type: none"> • recognising the writer, speaker, or shaper's purpose in creating a text and that texts influence people's ideas • recognising opinions, bias, points of view, gaps and silences and dominant readings in a text • understanding how texts are crafted according to the values, views and interests of the writer, speaker, or shaper • identifying the ways in which information or ideas are expressed and represented to influence and position readers, viewers or listeners • presenting an alternative position to the one taken by a text or deciding to endorse the position taken by a text.

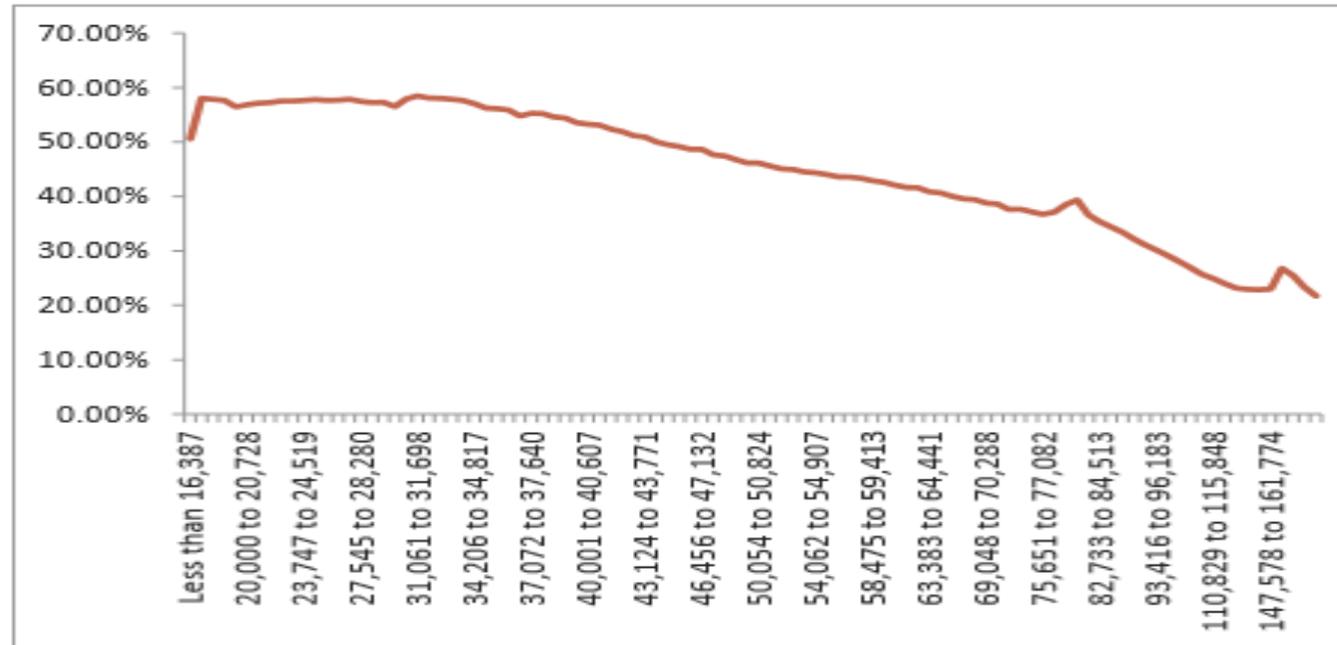
(Adapted from Freebody & Luke, 1990, Freebody, Ludwig & Gunn, 1995, Luke & Freebody, 1999)

Four resource model for critical numeracy

<p>De-coding</p> <ul style="list-style-type: none"> • What are the different ways numbers are used and represented? • What is the terminology being used and what does it mean? • What are the key mathematical concepts that are being used? • What are the key mathematical processes and procedures? <p>Be creative – collect all the terminology – categorise it into the key maths concepts, or create a concept map.</p>	<p>Meaning-making</p> <ul style="list-style-type: none"> • What is this text about? • How does it relate to what I already know? • How can I use what I already know? • How do the mathematical concepts make sense in this context? • How do the mathematical concepts help me understand the context? • What is confusing or misleading? • Are there other possible meanings? <p>Be creative - How might I represent the data differently to make it clearer or more meaningful?</p>
<p>Using</p> <ul style="list-style-type: none"> • In what ways are the numbers or mathematical concepts in this context significant or useful? • What is the purpose of the text and how does it connect into a bigger picture? • How might this text be used to promote particular viewpoints? • What are possible applications and likely impacts? • How would I use this text and what decisions would I make based on it? • In what ways am I now thinking about the issues and the mathematical concepts differently? <p>Be creative – Make predictions, develop a model, create your own study, write your own article, imagine scenarios, draw a <i>futures wheel</i>, or create a cartoon. Consider what data you might select or angle you might take if you were trying to persuade your audience of a particular view.</p>	<p>Analysing</p> <ul style="list-style-type: none"> • Is it true? – Are the mathematical concepts used appropriately in this text? What is the evidence? Does it have reasonable assumptions? Is it logical and consistent? Is it researched appropriately? Does it have a reputable source? What do I need to know more about to be convinced that it is plausible? • Is it fair? – Does it include different views, values, perspectives or types of research? What is missing? Who might be silenced? Where would I look for alternatives? • How does it position me? – What do I think the author's values and intentions are? What do they want me to believe? How do they use the mathematical concepts or terminology to position me? • Do I believe it? <p>Be creative – Set up debates where people in your class take on different roles or perspectives. Write a letter to the editor of the paper critiquing the article.</p> <p style="font-size: small;">Watson, J. (2009). Developing Critical Numeracy Across the Curriculum. <i>Numeracy in the News</i></p>

Problem 5

Figure 10: Proportion of women by percentiles in the income distribution



Source: Australian Taxation Office (2014) *Australian taxation statistics, 2011-12*.

Figure 10 clearly shows that women are disproportionately represented at lower incomes and do not reach 45 per cent, their overall share, until the fifty-third percentile and the income range \$51,606 to \$52,407. After that women are disproportionately under-represented. For example, in the top percentile women are only 21.7 per cent of taxpayers and they peak at 58.5 per cent of taxpayers in the twenty-first percentile with an income range of \$31,061 to \$31,698. The taxation statistics also show that, while women were 45 per cent of taxpayers, they earned 37 per cent of the income. In addition, while the average male income was \$78,407, for women the figure was \$56,527. That is a discrepancy of \$21,880 – or put differently, women earn 28 per cent less than men on those figures. As mentioned, ABS figures give wages and salaries by gender and they show women earn 17 per cent less than men.

Problem 5

<p><i>De-coding</i></p> <ul style="list-style-type: none"> • <u>Concepts</u> • Disproportionately • Represented • Income • Overall • Under-represented • Peak <p style="text-align: center;"><u>Operations</u></p> <ul style="list-style-type: none"> percent percentile range share average less than <p style="text-align: center;"><u>Vocabulary</u></p> <ul style="list-style-type: none"> • Figure • Discrepancy • ABS • Wage • Salary • Gender <ul style="list-style-type: none"> Taxpayer Male/female Earned Statistics In addition 	<p><i>Meaning-making</i></p> <ul style="list-style-type: none"> • Line graph slopes down from left to right • Wages increase left to right • Percentage of women workers shown on left scale • Incomes assumed to be annual – not stated in text • Text has a lot of information and vocabulary requiring explanation • Graph and text show inequity in earnings for women • Women are under-represented in high salaries • Women are over-represented in low salaries • Only at approximately \$43 000 are the number of women and men equal earners. How many? • What type of work is included? Does this mean that men get paid more for the same job?
<p><i>Using</i></p> <ul style="list-style-type: none"> • Line graph clearly shows reduction in number of females as wages increase • Graph and text used to highlight low wages of women • Using an average male and female wage to demonstrate the large discrepancy in earnings. • I am wondering what sort of work the women are doing to be paid less. • Data could be used to argue for higher wages for women. • This is not good for women who should be earning as much as men. 	<p><i>Analysing</i></p> <ul style="list-style-type: none"> • Data description uses averages to illustrate wage discrepancy. • No figures are given for each category which may affect calculation of averages. • Median wage may be better indicator of wage difference as few high earning males may skew average higher and more women earning less skew the female average lower than the respective medians. • Are these full-time positions or are part-time jobs included? This could account for 45/37 observation. • I need more information to confirm a decision that this data illustrates definitive proof that males have greater access to higher paying jobs. • I think the author may be trying to create an argument for a particular purpose without disclosing all the information required for an impartial inspection of the data. • I do think that women should be paid equal to men for the same job and the current situation is unfair. • I will write a letter to my local member of parliament and ask him/her to advocate for equal pay for men and women.

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