
Identifying Gifted Knowledge and Learning in Indigenous Cultures: Africa and Australia

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Introduction

Gifted knowing and thinking are manifested in different forms in different cultural groups. The aptitudes, attributes, and characteristics associated with gifted knowledge are culturally embedded and cultures differ in the ways of knowing and thinking they recognise and value. To identify gifted potential, the sociocultural context needs to be taken into account. Attempting to understand the key interactions that characterise the life of a culture in particular environments will contribute to this.

Identifying gifted and talented learners is a challenge for formal education provision. Given that this provision in 'developed countries' such as Australia is from a Western cultural perspective (Tannenbaum, 1986), the challenge is greater when the gifted knowledge and thinking are in socio-cultural forms not readily accessible to the conventional 'Western' assessment tools and formats. Some educators (for example, Borland, 2004) argue that "giftedness, as it has been constructed within American society has embedded in it the basis for the under-representation of certain groups outside the White middle-class and upper-middle-class mainstream" (Borland, 2004, p. 15). The term 'gifted knowledge in culturally and linguistically diverse cohorts' has been used increasingly in recent years to refer to the plurality of forms of gifted knowing and thinking.

This paper describes the use of an identification procedure that provides gifted and talented students the opportunity to display their gifted knowledge and thinking regardless of their cultural dispositions. The procedure has been used successfully to identify gifted and talented Kenyan adolescents who had attended regular state primary schools in Kenya (Munro, 2009). It proposes that the procedure is particularly appropriate for indigenous Australian students.

The paper begins by showing the link between the culture and the identification of gifted knowledge and thinking. It reviews the research relating to this identification in 'culturally and linguistically diverse' students and introduces the authentic problem-solving task as one means of doing this. It describes how these tasks were used to identify gifted knowing and thinking in African cohorts and draws implications for their use with indigenous Australian students.

The identification of gifted knowledge and thinking in ‘culturally and linguistically diverse’ students

Cultures differ in how they construct intelligence

Cultures differ in how they categorise and form concepts (Sternberg, 2007). While Western cultures generally see taxonomic hierarchical classifying as more complex and sophisticated than perceptual and functional classifying, African cultures value more the latter. Several Asian and African cultures value social intelligence more than do Western cultures. Rural Kenyan conceptions of intelligence identify four types of intelligence: knowledge and skills (riekeo), respect (luoro), comprehension of how to handle real-life problems (winjo), and initiative (paro).

Cultures also differ in how they value the thinking strategies used to solve problems (Sternberg, 2007). Anglo Australians used verbal (school-appropriate) strategies to remember visuospatial displays while Indigenous Australians used visual imagery strategies. Some cultures favour number computations in real life contexts (the ‘Brazilian street children’ or Berkeley housewives shopping in the supermarket) while others favour number computations in more symbolic forms.

The challenge: The need for effective identification procedures

Formal education seeks to identify these students so that given appropriate differentiated educational opportunities they will learn and achieve optimally. While there is little systematic data relating to the identification of indigenous gifted students in Australia, international evidence suggests that educators systematically under-select and under-refer culturally and linguistically diverse students for gifted education services (Saccuzzo, Johnson, & Guertin, 1994). Teacher judgements vary in their efficacy and are influenced by students' ethnicity (Elhoweris, Mutua, Alsheikh, & Holloway 2005).

Traditional intelligence and achievement tests used to identify middle-class white gifted students are less effective for gifted students from African American, Hispanic/Latino, and Native American backgrounds (Ford, Orantham & Whiting, 2008), for a number of reasons. These students may

- not be accustomed to answering questions simply for the purpose of showing knowledge; rather, they display their knowledge in response to authentic problems or issues;
- perform poorly on paper-and-pencil tasks conducted in artificial lab-like settings;
- not perform well on culturally loaded tests, particularly those that are referenced on cultures other than their own;
- have learning and/or cognitive styles that are different from white students;
- have test anxiety or suffer from stereotype threat; and
- have low academic motivation or engagement while being assessed.

Educators commenting on indigenous gifted education in Australia note similar trends.

Identification procedures that take account of cultural differences and environmental contexts differ from the traditional psychometric models in the following ways (Passow & Frasier, 1996):

1. They are based on a broad concept of giftedness that reflects “multifaceted, multicultural, multidimensional perspectives and is defined by traits, aptitudes, and behaviors to be nurtured rather than by static test performance” (p. 199).
2. While core attributes of giftedness may exist across cultures, the behaviours through which they are displayed may differ, because of the social and cultural contexts in specific cultures.
3. The identification process needs to recognise variability within a culture and avoid stereotypes and characterisations about a culture.
4. The use of multiple criteria and non-traditional measures — instruments and assessment tools other than intelligence and achievement tests is recommended.

How giftedness is displayed in diverse cultures

Through his theory of successful intelligence and giftedness, Sternberg (2007) identifies cultural concepts of giftedness, and draws attention to the problems that arise when conceptions that are relevant in one culture are transferred to others. Individuals are gifted “if they have the abilities needed to reach their own goals within their sociocultural context. They are intelligent successfully to the extent that they capitalize on strengths and compensate for weaknesses in order to adapt to, shape, and select environments. They do so through a combination of analytical (traditional academic), creative, and practical abilities” (Sternberg, 2007, p. 160).

Ford (2005) synthesises the outcomes of several investigators to compile a set of characteristics that describe how gifted culturally diverse students use their gifted knowledge. These characteristics include the following. These students are likely to

- display advanced reasoning, creative, divergent and innovative thinking that often generates unexpected and unusual ideas and high level problem solving strategies.
- be resourceful and adaptable; they can ‘read’ and relatively easily adapt to situations and respond adaptively.
- be strongly self motivated to learn and to understand their world.
- have comparatively well developed vocabularies in their mother tongues.
- learn new concepts quickly, look for and construct deeper meanings and make unusual and subjective links between ideas.
- spontaneously generate challenges, enquiries and questions about their world. They show critical, evaluative thinking and synthesise ideas in unique ways.
- assemble a comparatively large memory for both school and extracurricular topics.
- be aware of building their own interpretations and understanding of topics and their own points of view.
- have a keen sense of justice and morality, recognise and pursue inconsistencies and perceived unfairness.

- display leadership skills in a range of ways, for example, they may persuade others to their point of view, take the initiative in joint activities.
- show an intense interest in their world and in understanding it.
- comprehend and use humour beyond their age.

These lists of characteristics illustrate the universality of knowledge we call 'gifted' across cultures. They could assist in identifying gifted indigenous students.

The purposes of assessing knowledge and skills is also culturally defined. Western cultures assume that knowledge and skills are located within individuals and an assessment task examines what they know. Collaborating to respond to test items is not encouraged. In other cultures, knowledge is assumed to be shared and is located in a group, such as a family or a tribe. Collaboration is encouraged (Greenfield, 1997).

The criteria to be met by the identification process

Passow and Frasier (1996) recommend that the identification protocol take account of the following criteria:

- It allows individual students to display optimally their knowledge, dispositions and attitudes and ways of thinking.
- It is sufficiently objective; the display and interpretation of student knowledge needs to be, within limits, independent of the assessor and sufficiently 'transparent' that educators in gifted education would generally agree they are indicative of giftedness and talent.
- It recognises the agreed nature of gifted and talented knowledge.

The identification process needs to be flexible enough to compensate for the limitations of educational measurement.

Procedures to identify gifted culturally and linguistically diverse learners

Several qualitative and quantitative instruments are recommended for identifying culturally and linguistically diverse students and may include ethnographic or dynamic assessment, portfolios, test scores, teacher observation, behavioural checklists, writing samples, teacher ratings, and interviews and input from parents and community members. Certain student traits may alert teachers to consider further assessment (Castellano, 1998; Ford, Oranham & Whiting, 2008). Identification using multiple measures is recommended.

The use of authentic problem solving tasks for the identification of gifted knowing and thinking

One approach, developed by Sternberg and associates (Sternberg & Grigorenko, 1997; Sternberg, Nokes, et al., 2001), is to assess students' practical or 'successful' intelligence. This is the knowledge they have gained in adapting to their indigenous environment; their informal, tacit knowledge about topics such as natural herbal medicinals in Kenya; or hunting, fishing, dealing with weather conditions and picking and preserving plants in Alaska. This knowledge is not usually taught explicitly and is used regularly in real life contexts. The better developed an individual's practical intellectual skills, the better they can adapt to everyday environments.

Tacit knowledge tasks tap abilities separate from those measured by traditional intelligence or ability tests and account for performance beyond that explained by tests of general cognitive ability (Hedlund, Wilt, Nebel, Ashford, & Sternberg, 2003). The correlations range from negative to moderately positive (Sternberg et al., 2000, Sternberg et al., 2001).

Practical intelligence can also be assessed using 'performance tasks'. These tasks require students to "demonstrate advanced understanding and thinking on challenging problems. The tasks also require students to articulate their problem-solving and thinking processes" (VanTassel-Baska, Xuemei Feng & de Brux, 2007, pp. 14–15). These tasks have been more useful than traditional tasks in identifying gifted students in low-income and minority cohorts and offer a new approach to identification that will "recognize the different ways in which students display giftedness". This is referred to as 'authentic assessment'.

Sternberg (2006) describes two types of authentic problem solving tasks for identifying gifted successful intelligence: longer, more detailed 'case scenario' problems and shorter 'situational judgment' problems or SJPs. Individuals were presented with a problem situation that afforded them the opportunity to demonstrate a range of problem-solving skills, including the ability to recognise and frame up a problem, generate and justify a solution, identify the information to be used to do this and to evaluate the solution and recognise obstacles.

These tasks provide an avenue for gifted individuals to translate their knowledge and thinking into routines that lead to high level problem solving and decision making in everyday contexts. Sternberg and Spear-Swerling (1996) note a number of characteristics displayed by individuals who have high successful intelligence. These individuals:

- can translate thought into action by contextualising and applying it.
- know what they know and can use it to maximum advantage to work for them and can take steps to resolve what they don't know.
- are goal setters and set explicit, measurable goals and action plans to achieve them.
- are highly motivated, but know when to 'change direction' as well as to persevere.
- persist with solving a problem and show 'follow through'.
- believe they can achieve their goals successfully; they have high self-efficacy.
- can 'read', unpack and clarify problem solving situations to identify the problems that are theirs to solve.

Using SJP tasks to identify gifted knowing and thinking in African cohorts

The present paper draws on a study that investigated using the situational judgment problem context to identify gifted adolescents (Munro, 2009). Students attending state schools in Kenya completed SJP tasks as part of the following multi-step identification process, recommended by Lidz and Macrine (2001) for gifted culturally

and linguistically diverse learners.

The 'first phase' procedures identified a student's capacity to learn academically and to reason at a high level using earlier school-administered tasks and school, teacher and parent nomination procedures. The 'second phase' procedures sought to identify evidence of gifted and talented thinking. These comprised verbal and nonverbal cognitive tasks to assess fluid intelligence and provided objective and comparable measures of gifted thinking. Verbal cognitive tasks included vocabulary, creative story writing and personal story writing. The nonverbal cognitive task was the Ravens Standard Progressive Matrices (Raven, Court & Raven, 1992). The 'third phase' procedures sought to identify gifted and talented thinking and leadership potential. This entailed greater focus on analysing and evaluating each student's multiple ways of knowing, high level thinking, creativity and leadership thinking. This phase included the SJPs, a leaderless problem-solving task, and an interview. For the SJP tasks, the students initially generated a solution to a real-life, open-ended situation problem. They were then engaged in dynamic assessment (Munro, 2009). This used 'clinical interview' techniques to probe students' thinking about the open-ended problem solving.

Students' scores on the various assessment scales in the second and third phases were converted to standard scores (z-scores) and these were used to compute a 'composite gifted rating score'.

The characteristics of SJPs

The SJPs used to identify gifted knowledge and thinking have the following characteristics (Munro, 2009):

1. they are ill-defined, may need to be clarified and lack a single solution path.
2. they need adaptive responses to new or changing situations.
3. they are solved in "real-world" settings with time constraints and competing demands.
4. they may interact with other issues in the context; some solutions may not be consistent with the broader goals and values of the collective.
5. the information needed to solve them may not be obvious or readily available.

They assess students' ability to:

1. link ideas in richer, more differentiated and elaborated ways, with evidence of 'far transfer' links between concepts.
2. reflect on what they know and link problems or issues with what they know in multiple ways.
3. think about problems that are referenced in their cultures.
4. think about the problem in multiple ways and so to respect and acknowledge different learning and/or cognitive styles.
5. maintain appropriate motivation and engagement.

Preparation of the diffuse problems

Problem situations judged to be familiar to adolescent students in Kenya were selected and a description of each in English was written. Each draft was revised to have a Flesch-Kincaid readability index in the fifth-sixth grade range.

The descriptions were trialled with sixth grade students in Kenyan schools in terms of their comprehensibility and readability, and the extent to which they discriminated among students. The trialling was also used to select the conditions that permitted students to answer the tasks most efficaciously. This included using practice problem-solving tasks and allowing students to receive assistance in expressing their thinking in English. The instruction in the practice sessions was in both English and Kiswahili and students could ask a Kiswahili-speaking teacher to translate their ideas into English.

Administration of the diffuse problem

The SJPs were administered as follows (Munro, 2009). Students were guided to solve a practice problem by applying the following steps:

1. Work out what exactly was causing the situation.
2. Imagine what it would look like when it had been 'fixed'.
3. What things might you need to know, questions you might need to ask, to find out more about the situation?
4. What they could do to 'fix it'.
5. What obstacles or barriers could stop them from fixing it or could slow them down?
6. How they could overcome these obstacles.
7. How their problem solving activity could affect others and influence the community in which it was done.
8. How they could tell if the actions they were taking were actually working.

They received feedback for their responses to each aspect in both Kiswahili and English.

Prior to beginning to solve the problem, the children saw a short video of the Kibera slum. This was intended to reduce the likelihood that differences in students' experiential knowledge of the Kibera slum could influence student outcomes. Each student wrote their response. While doing this they had the opportunity to ask in Kiswahili for assistance for expressing an idea they had or for comprehending English.

The assessment of problem solving skills

Each student was cued to show evidence of the following aspects of problem-solving activity (Munro, 2009):

1. identify the problem.
2. identify a plausible solution.
3. construct a plausible problem-solving pathway and specify the actions necessary to attain the solution.
4. specify the information/assistance they would need to solve problem.

5. identify obstacles and difficulties in implementing their solution and to suggest ways of overcoming them.
6. identify individuals likely to be affected by the problem-solving activity.
7. identify how your solution would affect the community.
8. suggest how to monitor the effectiveness of the solution.

Each student's response to each aspect was scored in terms of two dimensions:

1. the number of relevant ideas (one versus more than one aspect); and,
2. the complexity of the thinking (literal versus inferential, mention of plausible ideas not explicitly stated, divergent reasoning, evidence of far transfer).

The cueing of each aspect of the solution was in the context of the whole problem. The students were encouraged to first think through the problem and its solution and to collate their ideas and to describe it prior to identifying each aspect.

The extent to which problem solving performance identified gifted knowing and thinking

Students' responses and solutions on the SJP tasks correlated strongly with their fluid intelligence scores on the Ravens Progressive Matrices and moderately with performance on the Creative Writing task (Munro, 2009). They also correlated strongly with the composite gifted rating scores. The correlation between Ravens Progressive Matrices and the Creative Writing task was not significant.

These findings support the interpretation that the open-ended problem-solving task was effective in identifying gifted thinkers and that the Ravens Progressive Matrices and Creative Writing scores contributed independently to it. As well, the open-ended problem solving task contributed approximately 60% of the variance on the composite gifted rating scores.

The quality of the responses of the higher problem solving students differed from those of the lower achievers in:

1. the breadth and depth of ideas displayed;
2. the complexity of links;
3. the relevance of ideas;
4. evidence of lateral or divergent thinking;
5. the fluency and flexibility of reasoning; and,
6. the display of leadership potential.

The relevance of the complex problem solving tasks for identifying gifted indigenous learners

The purpose of this paper is to examine the issue of whether social problem solving may provide an appropriate means of identifying gifted knowing and thinking in indigenous students in Australia. We know that indigenous constructions of giftedness differ from their Western counterparts. The gifted and talented children workshop conducted by the Aboriginal Consultants Initiative (n.d., see <http://www.cdu.edu.au/centres/yaci/gt/keyfindings.html>) provides clear evidence

of how giftedness in a Yolŋu community is associated with leadership of the community. It is a synthesis of a 'head thing' and a 'guts thing' and children are 'born with their gifts and talents'. The key concepts associated with being a gifted indigenous learner (see <http://www.cdu.edu.au/centres/yaci/gt/keyconcepts.html>) are associated with a well-developed capacity for solving social and cultural problems.

Chaffey, Bailey and Vine (2003) cite observations that individuals from cultural minorities often score lower than the general population on tests of general ability due to socio-emotional issues and inefficient metacognition rather than lower cognitive potential. One might expect, therefore, that referencing the identification of gifted knowledge in social problem solving, in part from a 'leadership of culture' perspective may provide a useful context for gifted indigenous students to show their gifted knowing and thinking.

SJPS tasks and indigenous gifted learners

Situation judgment problem-solving tasks take account of cultural plurality in how giftedness and intelligence are constructed in a range of ways. They ask students to think about and to solve problems that are relevant and familiar. The tasks have a conceptual organisation and that is consistent with the orientation to knowledge in their culture. The students are not asked to think about a culturally-different conceptual network.

The tasks assess the comparative breadth and elaboration of the ideas synthesised by students in solutions and ways of thinking about them. They differ in significant ways from the traditional intelligence and achievement tests that are used to identify middle-class Western gifted students and that discriminate against gifted students from other cultural backgrounds (Ford, Orantham & Whiting, 2008).

They provide an opportunity for indigenous Australian students to show to others their understanding and thinking about real life authentic problem situations that are relevant to them rather than on paper-and-pencil tasks related to culturally unfamiliar topics in artificial lab-like settings. One might expect that gifted indigenous students would show higher motivation and engagement on these types of tasks. The dynamic assessment component reduces the extent to which this display of knowledge is influenced by literacy and oral language differences. The students can show their knowing and thinking initially in familiar oral language, pictures and/or models and then be assisted to express this in English.

They also provide the opportunity for educators to 'see' the more advanced understanding and thinking of those indigenous students who are gifted. They meet the criteria specified by Passow and Frasier (1996): (1) that identification procedures recognise that students from different cultural backgrounds may display core attributes of giftedness in pluralistic ways; and (2) that the identification process recognise variability within a culture and avoid stereotypes and characterisations about a culture. The SJPs offer the identification protocol an objective, 'transparent' estimate of students' giftedness and talent. They are likely to add to information gained from the use of identification checklists such as the Harslett Rating Scales and the Academically Gifted Aboriginal Students (Department of Education Western

Australia, 2010).

The SJP tasks may be expected to allow the gifted indigenous students to display various characteristics of their gifted knowledge (Ford, 2005). These include showing (1) advanced creative, divergent and innovative thinking, (2) critical, evaluative thinking in unique ways and, (3) being strongly self motivated to learn and to understand their world. They encourage students to generate unexpected and unusual ideas and to be resourceful and adaptable in their thinking. The students can also show their sense of justice and morality and display leadership skills through the problem-solving activity.

Providing the opportunity for the students to show their understanding and thinking for topics that are relevant to their culture communicates to the students that their knowledge and culture are valued by the educational provider. The students can 'see' that issues that are important to their culture are recognised and valued as worthy of analytic and creative thinking by the dominant culture. The tasks reflect a broad 'multifaceted, multicultural' concept of giftedness (Passow & Frasier, 1996).

The future development of SJP tasks in a multi-step gifted identification process

This paper recommends the inclusion of SJP tasks in a multi-step identification process for gifted indigenous students. Validation of their efficacy is necessary. A design similar to that used for Kenyan cohorts would provide a starting point. As noted earlier, the Kenyan data suggest that they can contribute significantly to identification. In the 'three phase' identification process described earlier, the SJP tasks can be included in the third phase, where individuals construct an initial solution to the problem and then explain and elaborate their solution in the dynamic assessment component.

Appropriate authentic SJP tasks could be drafted with the characteristics noted earlier and administered in a similar way, with guidance through practice problems preceding the actual identification task. Problem contexts can come from a range of domains relevant to indigenous culture, such as music, fine arts, narrative, the environment, sport, health, history or drama. Students' responses can be assessed in terms of the aspects of knowledge described above, using a scoring system that takes account of both the number of relevant ideas and the complexity of the thinking. The tasks can allow students to respond in multiple formats, for example, orally, visually, technologically, through action and demonstration and through model construction, as well as through writing.

It is possible in the future that the emerging electronic information technology could be used to identify indigenous students using protocols that included SJP tasks. Situations could be presented on-line and students could generate possible solutions using e-technology. The dynamic assessment of students' initial problem-solving activity could also be implemented on-line.

In summary, the SJP tasks provide the potential for identifying gifted and talented indigenous students in ways that allow them to display their exceptional understanding and thinking. They offer an insight into gifted students' knowledge that is not provided by the conventionally-used tasks.

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