Current status of ICT policies for education of gifted students in Australia

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Abstract

The aim of this paper was to critically evaluate the current status of ICT policies for education of gifted students in Australia. The research utilises a document analysis methodology. Relevant policy documents and research articles on critical evaluation of Australian ICT policies for education of gifted students were collected and analysed.

Giftedness has varied definitions. Nature of giftedness also varies. Therefore correct identification of nature and level of giftedness requires use of more than one method. Giftedness needs education programmes specifically designed for them to develop into talents of full potential. ICT can play a major role here. Australia has definite policies for education of gifted students. However, Australian policy documents on education of gifted children rarely mention ICT policies related to it. Many elements of these policies imply use of ICT as facilitation factors. Research articles criticise the inadequacies of sufficient ICT policies for gifted children in rural and remote locations, especially as they concern Aboriginals and thus violate the principles of equity in education. STEM students include gifted students; but their performance in international tests had been declining. This is also an indication of the inadequacies of Australian policies for education of gifted students on STEM subjects. ICT policies can provide solutions to these problems to a great extent.

Inadequacies of teacher development programmes to prepare them for catering to the specific learning needs of gifted students have also been pointed out. All these show that, although a lot has been achieved, there is still a long way to go.

Some limitations experienced in connection with this paper have been pointed out.

Keywords: Gifted student education, Australian ICT policies, document analysis

Introduction

In any population, community or group, a small percentage will stand out as exceptionally above others in the population. It is more so among students. Out of a large population of students with varying types and levels of capabilities, a few will stand out and they form the ‘gifted’ students. Various estimates have put 2-5% of population as gifted. If we apply this standard for Australian students, the total number of students in Australia were 720150 in September 2019 including all sectors, which also had considerable foreign enrolment (ICEF, 2019).

Giftedness has been defined in various ways, since this quality need not always be on academic performance. For example, gifted artists, gifted sportspersons, gifted politicians are all possible. Hence defining giftedness is a complex issue.

National Association for Gifted Children, USA defines gifted students as those, “with gifts and talents perform—or have the capability to perform—at higher levels compared to others of the same age, experience, and environment in one or more domains.” (NAGC, 2021).

In Australia (ACT, 2021) definition most used by education departments is that of Francoys Gagné's Differentiated Model of Giftedness and Talent (2.0) (DMGT). DMGT definition says, "giftedness is a broad concept that encompasses a range of abilities: it also recognises that giftedness is only potential and must go through a transformative process in order to become a talent" (ACARA, 2013). In this definition, giftedness and talent have been differentiated, although the two terms are often used inter-changeably. Giftedness leads to talent if nurtured properly.

Giftedness goes beyond ethnicity, race, gender, culture or socio-economic status or geographic area. As explained above, giftedness is a potential for exceptional performance in the specific area. Special tools and teaching methods are required to develop them to the full potential. Many gifted students are basically introverts and have only limited social interactions. Sometimes, it may be necessary to train them to be more sociable.

The starting point of developing gifted students into talents is their identification and the area in which they are gifted. Many yardsticks and methods of doing this have been developed. Assessment by family, peers, teachers and experts at various levels have been prescribed by NAGC. Specific guidelines on identification process, characteristics of giftedness, consistent and possible indicators of giftedness and characteristics that can mask giftedness have been described in a document listed in ACT (2021). Tests used include IQ tests like The Wechsler Intelligence Scale for Children (WISC) (Watkins, Greenawalt, & Marcell, 2002) and non-verbal tests like Naglieri Non-Verbal Abilities Test (NNAT; Naglieri & Ford, 2003) and the Raven Standard Progressive Matrices (RAVEN; Raven, 2000) and combinations of both methods like Cognitive Abilities Test (CogAT; Lohman, 2011). These tests have varying reliabilities and have faced criticisms also (Hodges, Tay, Maeda, & Gentry, 2018).

Use of appropriate teaching method is an important aspect of developing gifted students to their full potential. The need to use ICT for effective teaching of gifted children was highlighted by Mustafayeva (2020). The need to recognise children gifted in using ICT as a unique talent like in other fields and designing appropriate teaching and assessment methods at schools was stressed by Ahmad, Badusah, Mansor, and Karim (2014). However, the efforts to use ICT to develop gifted students in educational institutions need to be backed by appropriate ICT policies of the government.

This research article uses analysis of literature dealing with ICT policies of Australian National and State governments for developing gifted students. Thus, the research question is-

To what extent the ICT policies of Australian National and State governments are appropriate for developing gifted students?

The methodology used to answer this research question is described in the section below.

Methodology

The research utilises a document analysis methodology. Relevant policy documents and research articles on critical evaluation of Australian ICT policies for education of gifted students were collected and analysed. Google was searched for policy documents of Australian governments on ICT policies for education of gifted students. Only six documents were obtained, out of which, two were reports of others. Furthermore, Google Scholar was used to search research articles published in 2006 or later, on ICT policies for gifted students in Australia for the purpose of

critical evaluation of ICT policies for gifted education in Australia. The search yielded 14 papers usable in this article.

The results of from this methodology are discussed in two sections below: current status of Australian ICT policies for the education of gifted children and critical evaluation of the current policies.

Results & Discussion

Current status of ICT policies of Australian National, State and Territorial governments

According to Farrall and Henderson (2015) there are three systemic policies on gifted students' education: Department of Education and Child Development (DECD); Catholic Education Australia and Lutheran Schools Association. The policy relevant to the school needs to be selected out of these. The Australian educational curriculum adopted by the Melbourne declaration 2008 of all educational ministers includes elements for educational needs of gifted students by stressing on equity and excellence. Further expansion of this point occurs in the description of learning areas and general capabilities. Cross-cultural implications of gifted Aboriginal and Torres Strait Islanders are also included in the description of curriculum statements. Some of these can be achieved through facilitation of ICT in teaching gifted children, although the policy statements on school environment, do not mention it explicitly. There is a policy for admitting gifted children earlier than others at pre-school or school stage.

The wider topic of STEM policies was critically reviewed in the same report of Timms et al (2018). The report lists the Australian STEM education strategies for 2016-2023, which were supported by education ministers in December 2015. The strategies of increasing the student STEM competence, teacher capacity to teach as per STEM requirement and support to schools contain elements of ICT policies. The flow process of STEM students filter out less competent students as they progress to secondary and senior students. At this stage, gifted students remain in STEM education. Hence the STEM policies are also policies of gifted education and inclusion of ICT elements in it is a critical requirement. In the report, a list of STEM policies for students, teachers and curriculum has been tabulated. This contains many ICT policies with links to sited where details are given. A policy of summer schools for students contain ICT initiatives called DigIT and Curious Minds. For teachers, there is a CSER Digital Technologies Education programmes and digital literacy school grants to train teachers in ICT skills for teaching. In the case of curriculum, Digital technologies curriculum and computer coding and Australian Digital Technology challenges for Year 5 and 7.

Schools located in rural and remote locations have been using distance education since the early 1900's. ICT has been increasingly used for synchronous and asynchronous learning through interactions. Giving examples from NSW, Downes, Roberts, and Barbour (2020) observed that these practices included gifted students also. These innovative strategies were backed by the policies of the NSW state and local administration of the respective areas. In another similar work related to Queensland, Duff (2020) investigated on the provisions and support measures for gifted and talented students in rural and remote locations of the state, which included ICT policies.

A report of SiMERR National survey 2006, Lyons, Cooksey, Panizzon, Parnell, and Pegg (2006) revealed policy deficits in addressing the needs and support required for teachers in rural and remote areas to use ICT especially to teach gifted and talented students and Indigenous students.

Combining classes to share the limited facilities was practised to a greater extent in rural and remote locations than in city or metropolitan areas.

Northern Territory policy document on education of gifted and talented students (NTBoS, 2018) contains use of digital technologies to teach students in Appendix C of the document. The document Australian Curriculum (Australian Curriculum, 2021) describes the curricular requirements of gifted and talented students and provides state-wise information. But it does not clearly state the need to use ICT to teach these students.

Critical evaluation of the Australian ICT policies for gifted students

A review by Batanero, Rebollo, and Rueda (2019) concluded that there had been few studies on use of ICT to support gifted students. Greatest scientific impact was noticed in Australia and European and North American countries. Qualitative methods with some reflections were used as the methodology in a majority of papers. But this review discussed about impact of ICT on gifted students rather than policies. The paper was included here to provide a starting point.

The disadvantageous position of aboriginal gifted students in their rural setting with respect to access to ICT, despite many specific policy initiatives by local administration and state and national governments was highlighted by Townend, Hay, Jung, and Smith (2021). The need for a prioritised policy to provide the required ICT infrastructure and technical support for Aboriginal gifted students was highlighted by Sazali, Franklin, Dillon, and Yeung (2020).

The TIMSS results of 2019 show that Australia has gained in its rank position with respect to Year 8 maths and science and Year 4 science. However, Year 4 maths has not improved since 2007. Only 68-78 percent of students achieved the international intermediate STEM proficiency standard compared to more than 90% by leading countries like Singapore. This standard was achieved only by Year 8 science students since 2015. These data were given by ACER (2020). According to the report of Timms, Moyle, Weldon, and Mitchell (2018) discussed above, ICT has been an essential component of improving students' performance in STEM subjects nationally and internationally. However, even if these policies have been implemented well, there is still a long way to achieve the desirable level of proficiency in STEM.

In the report (ACER, 2020), among states and territories, only ACT (space sciences), QLD, VIC and WA have specified ICT policies for students, teachers and/or curriculum. The trend in ICT literacy had been a declining performance since 2011 during the period of 2000-2015. The varying policies of assessing ICT literacy for different years of schooling is a barrier in developing an integrated ICT policy. There is less emphasis for ICT literacy in STEM curricula. Only recently, a push to include technology in the traditional school curriculum also to close the gap between traditional and STEM curricula. Policies and strategies to keep the pace of technology curriculum with the development in the field have been devised. The tendency in Australia, as in USA, had been to keep technology within maths and engineering literacy rather than a separate subject. Policies towards integrating STEM curricula of the four subjects into one class, unit or lesson utilising their connections with real world problems, has been tested. Implementation is complex as teachers need to be trained specifically on this or could result in uneven outcomes.

It was pointed out by Bannister, Cornish, Bannister-Tyrrell, and Gregory (2015) that use of ICT for teaching and learning of gifted students in NSW were driven by policies to focus on three

core subjects through virtual high school environments and at the same time, teach and learn other subjects in their local schools along with other students.

Supported by funding from SiMERR NSW, an enrichment program for gifted rural and regional school students, the School of Education, University of New England developed and implemented. The innovative practices for teaching of gifted students included innovative use of ICT. In this innovative method, three vignettes of instances were used to assess the use of ICT and capabilities of problem solving, creation and designing of animations and structure and function of lamb brains of gifted students (Smith & Smith, 2009). The other side of the policy, as highlighted by Smith and Laura (2009) is creation and development of personalised educational ecologies for gifted children, in which promote teaching and learning contexts with more interactions for them with peers, teachers, other adults and mentors and not rely entirely on use of ICT for educational and communicative interactions. This policy is reflected to a great extent in the Australian ICT policies for gifted education by not giving ICT too much emphasise in the policy statements (see the statements in ACT (2021)).

In an ACER report, it was pointed out that in recognition of the importance of ICT in work and life, Australia has made ICT literacy is part of its National Assessment Program. The assessment programme is being conducted by ACER for the national government. The Year 6 students progressed well since the last assessment in 2005 and Year 10 students showed only a slight improvement. A One Laptop per Child programme was launched to help children to learn and use ICT in difficult rural conditions. This has shown positive results. ACER launch the Digital Education Research Network (DERN) of experts, leaders, researchers and colleagues interested in research on the use of digital technologies in education. Although none of these were specifically meant for gifted students, a large part of these policy-driven ICT strategies benefitted gifted students also (Masters, 2010).

In a review of policies of different states and territories of Australis on education of gifted students, Walsh and Jolly (2018) noted some similarities and differences among them. The policies are different for each state and territory education department. All these policies define giftedness according to Gagné's Differentiated Model of Giftedness and Talent as their definition of giftedness. There is no uniformity among states, school sectors or schools in identifying gifted students. However some similarities in the use of certain IQ tests and certain other procedures to identify gifted children do exist. To address the specialised curriculum for these students, state policies suggest curriculum differentiation, ability grouping in some form and some forms of acceleration; but these are mostly left to the schools. There is a list of policies of six states and territories for gifted children. The list provides the year of the latest policy and brief content of the policies. If these descriptions contain all the elements of the policy, none of the policy statements mention anything about an ICT policy for the education of gifted children. There is a mention of a successful model of virtual school to teach gifted students in NSW. In a similarly tabulated list of state programmes, only Tasmania uses a government-run online extension enrichment programme to extend and enrich gifted students from preparatory to year 8 stages. A document of Tasmanian Department of Education (Department of Education, No date) mentions about gifted online courses offered in various subjects.

One aspect of ICT policies is the training and development of teachers for using ICT for teaching gifted students. Hardy (2008) observed that the Australian Federal policies formulated during 1996-2007 by the then ruling government have supported this requirement to a large extent. Even in the case of science, technology, engineering and mathematics (STEM) education of

school students in Australia, need for teacher training policies apply, as the report by Timms, Moyle, Weldon, and Mitchell (2018) suggests. ICT was one of the teaching strategies identified by pre-service teachers of gifted students in the studies of Watters, Hudson, and Hudson (2013) using interviews of 22 pre-service teachers undergoing training in a small regional campus of a large Queensland university.

Conclusions

Although educational policies for gifted students have been spelt out clearly in the National, state and territorial government documents, explicit statements about ICT policies have been specified only by very few states. Some policies imply use of ICT for education as a facilitation of their learning, as in the case of gifted students in rural and remote locations, of whom the majority are Aboriginals and Torres' Strait Islanders.

Absence of clearly spelt-out ICT policies in the policy documents of governments is the major limitation to undertake a document analysis and evaluate the current status about this topic. Research reports specifically on ICT policies for education of gifted students are also rare. Hence, in both cases, indirect or implied evidence were used for evaluation in the above review.

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