Gifted education in Malaysia: A promising tomorrow

Syamil Bin Ahmad Shakir[1], Myra Aidrin Binti Mohd Ali[2]

[1] Email: syamil@usim.edu.my
[2] Email: myraaidrin@usim.edu.my
Kolej GENIUS Insan,
Universiti Sains Islam Malaysia, MALAYSIA

ABSTRACT: *Gifted education in Malaysia can be traced back to the 1980s. However, the first gifted school was established in 2011. It was later included in the policy as the awareness of gifted education gained more significance. The gifted education curriculum is specifically designed to tailor to the needs of gifted students while also accommodating the standard national curriculum. This paper reviews history and current practice of gifted education in Malaysia. The conclusion showed that there is much room for improvement for gifted education in Malaysia and find the best system to cater to the needs of gifted students that are arising in Malaysia.*

KEYWORDS: **Gifted education, history and current practice, national curriculum.**
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1. Introduction

As a developing nation, education is at the heart of each individual in Malaysia from different races. Moving towards a developed knowledge-based economy, issues about education are vital. With a 30 million population, Malaysia is the 4th biggest economy in Southeast Asia after Singapore, Thailand and Indonesia. It is compulsory for children to attend school for 11 years starting from the age of 7. Primary school consists of students from age of 7 - 12 years old, whereas secondary school students are from 13 - 17 years old. Primary schools in Malaysia use a standard curriculum nationwide. Secondary schools, on the other hand, focus more on a specialised curriculum in which students are given the option to choose from a field of preferences (science, art, vocational, religious or other streams). There are several categories for selective government-funded secondary schools, such as fully residential schools, premier schools and high-performance schools. These schools follow national curriculums and examinations and receive more funding and obtain management flexibility. Some of the selective schools have existed since the formation of Malaysia in 1963. Selection to the schools is based on the national examination's results during the final year of the students' primary school education. On the whole, education in Malaysia is a realisation of the national education philosophy that states, "Education in Malaysia is an ongoing effort towards further developing the potential of individuals in a holistic and integrated manner, to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonious, based on a firm belief in and devotion to God" (Malaysia Ministry of Education). This paper aims to review the history and current practice of gifted education in Malaysia which has its roots in the 1980s as a university research project. The paper is divided into several sections namely History of Gifted Education in Malaysia, Policy and Law, Student Admission, Curriculum, Method of Teaching, Assessment and The Road Ahead. Some of the most important aspects are discussed thoroughly.

2. History of Gifted Education in Malaysia

The implementation of gifted education was started in the 1980s by the late Azman Wan Chik, a former associate professor and academician at the Faculty of Language and Education, University of Malaya. Azman pioneered a project on the philosophy and pedagogy of gifted education in Malaysia, known as Program Pintar Cerdas BAKA (*Breed*). The programme was in the form of a school holiday enrichment camp. The modules prepared were related to the thinking process and skills, enrichment of school subjects as well as the application of what had been taught (Azman, 1990). The programme however was discontinued but was adopted by some of the selective fully residential schools mentioned earlier.

Contrary to the other selective government-funded schools that admit solely based on examination results, which can be cleared through intensive coaching and rote-learning, gifted schools in Malaysia emphasize the General Intelligence Factor (g-factor) described by Charles Spearman. Besides the g-factor, the focus is also on the students' cognitive intelligence that describes the students' ability to think abstractly, logically and connect seemingly unrelated points. Cognitive intelligence is further quantified through the concept of mental age by a designated instrument. Note that mental age does not totally depend on the age of the students. For example, a gifted 13-year-old student might have the mental age of an 18-year-old student. Underachieving students with high mental age may be admitted if he/she passes the test.

In 2009, gifted education officially started through school holiday camps that are modelled after John Hopkins Center for Talented Youth (CTY) Summer Programmes. The school, however, started to admit its first batch of students (age 16) in 2011. The school, GENIUS@Pintar (then PERMATApintar) is housed and managed by the National University of Malaysia (UKM). Students of age 13 were first admitted in 2014. The second gifted school in Malaysia, GENIUS Insan College, started its operation in 2015 under the management of the Islamic Science University of Malaysia (USIM). Both schools are considered government-funded schools and they are fully monitored and supported by the Ministry of Education.

Each school has the capacity to admit approximately 500 students. Nevertheless, to date, there are 462 students in GENIUS@Pintar, while GENIUS Insan College has 306 students. In 2021, the third gifted school, Akademi Pintar Pendang, will begin its operation in Kedah, a northern state of Malaysia. Located outside a university campus, the school is independent of university management and will be fully operated under the Ministry of Education Malaysia. Gifted education in Malaysia is portrayed as special-needs education. Hence, the principal/director of the gifted schools is mostly from psychology backgrounds.

3. Policy and Law

Before 2013, the policy of gifted education in Malaysia was not clearly stated in the Malaysian Education policy. However, due to the rising awareness of the needs of gifted children, through the Malaysia Education Blueprint 2013-2025, the gifted education programme has been included as a national agenda. The agenda is divided into 3 Waves.

Wave 1 (2013 - 2015) focuses on building a better understanding of the needs of gifted children in Malaysia and designing programmes that address their needs. The Ministry will benchmark local programmes against other systems with top-performing programmes for gifted students to identify areas for improvement and replicate successful practices. Additionally, the Ministry will establish working partnerships with the private sector and leading research institutions to start developing its own set of gifted and talented programmes (Malaysia Education Blueprint 2013-2025). It is evident that during this wave, the collaboration with John Hopkins Center for Talented Youth has been strongly established where most of the programmes and assessments are adopted from their modules. There is not much evidence that an Asian model of gifted schools was replicated. Malaysian Gifted programmes may have overlooked the idea of adopting the Asian model, which is disregarded despite the fact that it is Asian students who are catered to.

Wave 2 (2016 - 2020) will see the piloting of these new programmes. The Ministry will start exploring and piloting programmes for gifted students (1% of the student population) who are gifted in a specific area such as Mathematics, Linguistics, Music and Visual Arts. Students will have a tailored, flexible education programme that enables them to receive instruction from experts in their field while still participating in mainstream schooling (Malaysia Education Blueprint 2013-2025). Having both gifted schools as pilots, the plan is realized with the building of the new gifted school that will start its operation in 2021. The school is independent from the management of universities. The gifted school in Pendang, Kedah is directly under the

Ministry of Education.

Wave 3 (2021 - 2025) will see a nationwide scale-up. During the final phase of the Roadmap, the Ministry will refine the design of the pilot programmes and gradually scale up the pilot programmes nationwide (Malaysia Education Blueprint 2013-2025). With this plan, we expect to see full-fledged gifted programmes run in each state in Malaysia.

Teachers appointed by a gifted school must attend a minimum of 60 hours of pre-service training. Teachers are employed as university staff and usually require a minimum of a master's degree in any relevant field. Contrary to mainstream schools, the gifted schoolteachers are appointed by the director of the gifted schools who have the authority of the appointment. The school directors are appointed by the University management and must be one of the existing faculty members. Apart from the pre-service training, there is in-service training provided for the teachers and school administrators. Training on gifted students' pedagogy and counselling are provided annually as teachers are to be updated with the latest approaches in teaching/ learning gifted students. The current school's top administrators, such as the directors, possess certificates in education or gifted education. Some of them attended and hold post-graduate diplomas and certifications in gifted education from institutions such as the University of New South Wales (UNSW). On average, the schools have 4 teachers for each mathematics, physics, chemistry, and biology subject. As for other subjects, there are generally 2 teachers for each subject, and if needed, temporary teachers are employed.

In 2019, the programme was renamed and reassigned directly under the Ministry of Education Malaysia, which was previously under the Prime Minister's Department. Besides receiving an allocation from the Ministry of Education, the schools also received financial support from the housing universities. The students are also allowed to use university facilities, such as libraries and laboratories. As for the school facilities themselves, they are relatively better than any other public school. Students may also bring their personal computers or tablet for learning purposes. The schools also received academic support from the university in terms of curriculum development, research mentorships and teaching of advanced subjects.

The Malaysia Education Blueprint clears the way for the nationwide development of gifted education. This will also allow the school to have some administrative autonomy, which is crucial to steer the schools towards objectives that are different from other government-funded schools.

4. Student Admission

Malaysia encourages participation in admission into the Malaysian gifted schools. In line with the principle "no child is left behind", every child between the age of 9 and 15 is welcomed to attempt the first selection test which is done online. Every year, the GENIUS division from the Ministry of Education will announce the dates when the test is offered. Most schools will inform parents through various media platforms. Some schools will take the initiative to gather their high achievers and make them sit for the online tests under the teachers' observation. Some even have a special class catered for outstanding students who will be made mandatory to sit for the test. On the whole, the selections are based on three main phases including completion of a school holiday camp.

The first test is called UKM1; an uncontrolled IQ online test offered from February until May every year. The test consists of two sections. Section 1 is a non-verbal section that tests the student's ability to think inductively. Section 2 consists of two sets. Set A is a verbal section, where the questions are open-ended. Students are required to describe the meaning of any given problem. Set B is a multiple-choice question where students are required to select the best answer out of 5 choices. UKM1 measures both verbal comprehension and inductive-deductive reasoning. It is open to anyone as it requires no fees, and it can be done anywhere with internet access. Candidates must attain certain scores to be selected to proceed to the next test, UKM2.

Those who have succeeded UKM1 will be called to sit for UKM2, a controlled online test,

from June 1 at the exam centres specified by the Malaysian National Gifted Centre, GENIUS@ Pintar, UKM (National University of Malaysia). Under the observation of the gifted schools' personnel, candidates are required to complete UKM2 in 3 hours. UKM2 measures verbal comprehension, inductive-deductive reasoning, recall memory and information processing. Those 4 domains will give the general picture of cognitive ability quantified by mental age. The cut-off score will determine whether the students will be invited to attend a 2-week camp programme in Phase 3.

Students aged between 9 - 15 years old who meet the cut-off scores for UKM2 will then be invited to participate in the School Holiday Programme conducted annually in December at GENIUS@Pintar, UKM or GENIUS Insan College, USIM (Islamic Science University of Malaysia). Those who show inclinations towards Islamic studies will be recommended to participate in the Holiday camp at GENIUS Insan College, USIM. Students are to attend a 2-week camp. During the camp, students are assigned a specific course and will follow the assigned course for the whole 2-weeks. The courses are designed and handled by subject experts i.e., university teachers and researchers, together with teaching assistants, who are normally graduate students. During the camp, students will be assessed daily based on their characters, participations, quizzes, tests, and interviews. The camp has been modelled after the John Hopkins-Center for Talented Youth summer programme. The School Holiday Camps for both places offer STEM-based programmes, whose courses are aimed at instilling interest in STEM among the young gifted and talented students. Some of the courses are Logic, Cryptology, Biotechnology, Flight Science, Crime Scene Investigation, Crystal and Polymer, Engineering, Probability and Game Theory, Ethnomathematics, Mathematics for the Universe, and Robotics. For GENIUS Insan College, USIM, there will be additional courses about Islamic studies. Students are required to reside within the university campus for two weeks, having academic activities from 8 am until 4 pm and followed by co-curricular activities in the late afternoon.

During the camp, students will have to go through assessments (UKM3 for GENIUS@ pintar College and *Muqayyam –Al Abrar* for GENIUS Insan College) and meet the criteria during the two-week camp to secure a place at the gifted school. In other words, the school-holiday camp is used as a screening tool for admission to both gifted schools. An interview conducted with the student is also part of the assessments.

The screening for admission to gifted schools in Malaysia is fairly demanding as the aim is not only to gather the 'crème de la crème' but also those who have a Nobelist mindset; bold, determined, resilient, and persistent, as well as having creative thinking. The quality of being inquisitive and having high curiosity is commendable for the admission.

5. Curriculum

The gifted education programme in Malaysia is in the form of a fully residential school, except that the programme has its own curriculum and school system. The curriculum maintains the national curriculum that is required of the students, which is *the Sijil Pelajaran Malaysia* curriculum (Malaysian Certificate of Education, equivalent to the General Certificate of Secondary Education (GCSE) in the UK) as the core curriculum, with enrichment syllabus from *Sijil Tinggi Pelajaran Malaysia* curriculum (Malaysian Higher School Certificate, the precursor to the GCE A-Level in the UK) and the United States's College Board Advanced Placement curriculum. The rationale behind the merging of these curricula is to develop one curriculum that could challenge the minds of gifted and talented students.

Students are to go through two programmes in Malaysian gifted schools. They are Foundation program and High school Diploma programme. Foundation Programme is offered to Foundation 1, 2 and 3 students, aged 13, 14, and 15. Whereas the High school Diploma programme is offered to Level 1 and 2 students, aged 16 and 17. Students who show extraordinary achievement in academics at the age of 15 may opt for an accelerated option in which they will skip an academic year. Unlike the mainstream schools,

gifted students will start taking all pure science subjects (Biology, Chemistry, Physics), as well as Additional Mathematics, in Foundation 1. This may seem a lot for a 12-year-old to take and digest, however, since the establishment of gifted schools in Malaysia, there are zero cases where students quit and are not able to cope with the workloads

There are six major components in the Malaysian Gifted Education curriculum: Philosophy & Elective, Advanced subject/ advanced placement, Self-Development & Enrichment, Research, Computer Science, and International Language.

Research is emphasised in the gifted education curriculum. It helps channel students' high inquisitiveness and curiosities of the world into a more systematic strategy. It exposes students to steps in gathering information from different sources, planning and scheduling, collecting data, and conducting interviews, observations, and experiments. With research, they are able to reflect and reason, and this can lead them to develop strong, logical minds while making sense of their world. They will also learn to figure out what is not in their right places, turning them into problem solvers. Research requires critical thinking imbued with moral and ethical judgement, and a skill to be able to do both systematically and accurately.

Students' ability in research is defined by Bloom's taxonomy, where students should be

Table 1: A comparison between National Curriculum and Gifted Curriculum

Level	National Curriculum	Gifted Education Curriculum
Foundation 1 Foundation 2 Foundation 3	Malay English History Geography Mathematics Science Arabic Language Computer Science Physical Education Islamic Studies	Malay English History Mathematics Additional Math. Physics Physical Education Chemistry Biology International Language Islamic Studies (3 Courses) Philosophy & Logic Computer Science Research Programme
Level 1 Level 2	Malay language English History Maths Additional Maths Physics Physical Education Chemistry Biology Islamic/Moral Studies	Malay language English History Maths Additional Maths Physics Physical Education Chemistry Biology Computer Science International Language Islamic Studies (3 Courses) Philosophy & Logic Self-Development Intro to Psychology & Human Behaviour Linear Algebra Calculus AP Subjects (e.g. Statistics, English Literature) Research Programme

Figure 1: Six major components in Malaysian Gifted Education curriculum

able to create/produce materials, methods or scientific conclusions beneficial to society at the end of the course. A hierarchical model by Benjamin Bloom (1956) that categorises learning objectives into varying levels of complexity, from basic knowledge and comprehension to advanced evaluation and creation. It is important that the gifted curriculum produce students who are critical and analytical in thinking, as well as being knowledgeable and opinionated when it comes to solving problems. This can be achievable with the emphasis on research in the curriculum.

Figure 2: Research in Malaysian Gifted Education curriculum

While both gifted schools aim to produce competent students with high self-esteem and confidence, the curriculum of GENIUS Insan College focuses more on moulding gifted learners who are holistically balanced. The niche area of GENIUS Insan College is the integration of revealed-knowledge (*naqli*) and acquired-knowledge (*aqli*), also known as INAQ, which is the college's core principle to produce Muslim scholars who are capable to propose solutions and solve modern-world problems through the lens of Islamic perspectives.

On the whole, the gifted education curriculum is more intense and diversified than the national curriculum. Providing early exposure towards specific science subjects such as physics and chemistry with different pedagogy will instil the self-confidence needed to reach their highest potential. The addition of humanities subjects such as logic and philosophy is to lay the foundation for inquisitive and affective mind within systematic logical thinking. Those skills are highly needed, which will be beneficial for the betterment of society.

6. Methods of Teaching

Teachers teaching gifted students are fully aware of the asynchronous development of gifted and talented children. Their mental capacities are way more advanced than their chronological age. They may be extremely sensitive or overexcited, succumb to perfection or even seem disruptive. Hence, teachers are taking both roles as academicians, as well as counsellors.

In terms of academics, the school implements three main teaching strategies; compressed/compacted, accelerated, and enriched. With compacting, teachers will determine the lessons that the students have already mastered and make adjustments to the materials to be learned, in which the content taught should be new. Accelerating means that students whose learning rates are faster are given the option to skip a grade. In the case of Malaysian gifted schools, the programme focus on the options of grade acceleration and content acceleration. The identified candidate can be accepted into the school at the age of 12 for Foundation 1. For existing students, from Foundation 3 they can advance to Level 2. The Accelerated Learning Program matches students' abilities and talents with optimal learning

opportunities and environments. Based on the student-oriented teaching/learning system, the school also emphasises enrichment strategy in ensuring that the students do not remain in their zone of accomplishment. They need to be in their zone of proximal development (ZBD) to provide them with the challenges they need while stimulating their interest and cognitive development. Vygotsky (1978) referred to ZBD as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers".

Malaysian Gifted Education teachers are always given in-service training to ensure that they effectively conduct differentiated teaching/ learning centred by the variety and multiple giftedness and talents of the students. However, implementing differentiated teaching may not be as easy as it is laid out in the curriculum. The time constraint in the student schedule for each subject may not cater to the vast diversity of cognitive abilities of these students. Besides teaching courses, teachers are also given regular training on class management, in particular handling gifted and talented students' psycho-social-emotional issues. Although not as competent as the schools' counsellors, teachers are made to understand that all teachers to gifted children are counsellors. They should be able to manage students' emotional distress, engage in a more collaborative stance rather than being rigid and defensive, and attune to their mental age while using words and concepts to their intellectual capacities. Ideally, a teacher cum counsellor is crucial in all gifted schools, however, in reality, not all teachers are all-rounders and they are not expected to fully carry the task of a counsellor when their expertise is in other disciplines.

In research, teachers are the supervisors, as well as facilitators who monitor and supervise the students' research works. They are also responsible to match the students to the field experts in local and international universities. The corresponding experts act as mentors in advising, teaching, and they will embark on the same research together. Teachers are also the ones who will look for opportunities for the students to present their research papers in conferences and to participate in competitions.

Other student-oriented activities implemented as teaching/ learning strategies are cooperative learning, group discussions, lab/ field practical training, joint-research, folio building, mobility programmes such as leadership camps and student exchange programmes, and self-development activities. Most of the time, students are given the liberty to work independently where teachers' roles are as facilitators.

Asian culture that emphasizes the authority of teachers and is less exploratory makes it challenging for teachers as well as the students to adapt to the new environment. The adaptability process consumes time and, due to the time-constraint to catch up with the syllabus, teachers usually have to resort to the mixed teaching method that involves both lecturing and exploratory learning. Moreover, this culture that is too exam-oriented and too dependent on 'standards' creates a problem in bringing out the best potential of these gifted students. Students are still required to sit for the national examination, which is in favour of students learning by rote rather than conceptual/ exploratory. To compare with the national mainstream exam results may not be fair for gifted students although everyone including the stakeholders holds on to the standard examination as a tool to gauge students' academic achievements. Hence, a clear benchmark is needed for Malaysian gifted schools to base on. Malaysian gifted schools should refer to other established gifted schools in more experienced countries, such as Vietnam, South Korea and Russia to compare learning and teaching effectiveness.

8. Assessment

Similar to mainstream national schools, Malaysian gifted schools employ both formative and summative assessments as they are deemed essential in the comprehensive evaluation of gifted students (Gallagher, 2006; Van Tassel-Baska & Brown, 2007). The formative assessment

is done in terms of tests (pre, post, and oral) administration, as well as graded assignments and presentations. The summative assessment, on the other hand, evaluates students' performance in their examinations such as the mid-term, final, and national. However, for gifted schools, the bulk of 50% is taken from summative assessment, whereas the rest is from research and other components in the curriculum. It is compulsory for students to sit for term assessments for two semesters annually. Exam scores from Foundation 1 until Foundation 3 will be accumulated to award students with the Junior Diploma/Certificate. As for Level 2, exam scores will be accumulated from Level 1 for the award of High School Diploma (HSD). HSD result is then used by the students to apply for university placement in the United States of America (USA). As the result, students are also eligible for scholarships offered by private organisations that have specific allocations for HSD holders. Despite having special examinations as mentioned earlier, it is compulsory for Level 2 students to sit for SPM, a national examination taken by all 17-year-old secondary school students in Malaysia. The *Sijil Pelajaran Malaysia* (SPM) has traditionally been used as a way to gauge students' merit for the scholarship.

On the whole, the gifted education system in Malaysia is still stuck with the standardised national examination. As of now, the gifted curriculum in Malaysia does not have specific assessments evaluating gifted students. By right, within the gifted and talented environment, it would be valid and reliable to test students using the above-level testing that differentiates between "talented" and "exceptionally talented" students (Hollingworth, 1916; Stanley, 1985, 1991, 2005). Knowing how students performed on an above-level test helps the school to identify the students' fullest potential. This will enable the school to provide appropriate enrichment for the students besides giving them more challenging educational options.

8. The Road Ahead

The gifted education programmes in Malaysia can be assured to go a long way in the Malaysian system of education. The recent Malaysia Education Blueprint 2013-2025 released by the Ministry of Education has outlined long-term plans in supporting the implementation of gifted and talented programmes in Malaysia. This shows that the government has high awareness of the benefits of placing gifted children in a well-deserved environment. Gifted education schools can keep gifted children challenged and engaged. By putting them in the right educational system with appropriate educational programmes, gifted students will learn how to turn the adverse effects of boredom, frustration, under-challenged and resentment into a more meaningful, challenging environment. Since their establishment, GENIUS@Pintar, UKM and GENIUS Insan College, USIM have shown a plethora of success stories with regards to their students' achievements. The *Sijil Pelajaran Malaysia* (SPM) results of the students are placed at the nation's top lists for years, although this exam may not be the best evaluation tool for gifted students as it can be easily aced through rote-learning. GENIUS@Pintar, UKM can be proud of its more than 100 exceptionally gifted and talented students who have furthered their studies overseas at top universities in the United States of America at the age of 16 years old. Likewise, the younger GENIUS Insan College, USIM, which just had its first cohort of school leavers, can also be proud of the students of whom more than half have secured prestigious scholarships to further their studies. The students from both schools have shared their successes in innumerable competitions, from Contests to Innovation Challenges, on the media. However, the majority of gifted students in Malaysia show fewer achievements in any major International Science Olympiads such as International Mathematical Olympiad (IMO), International Physics Olympiad (IPhO), International Chemistry Olympiad (IChO), etc. Perhaps, instead of focusing too much on national examinations, students should be exposed to more mental-challenging content beyond the standard curriculum and also given more hours to such activities. More resources should also be provided to building libraries with more sufficient and relevant resources.

These two gifted schools have received numerous recognitions locally and internationally and they have demonstrated success in executing gifted programmes, which inspired the ministry to set up new branches of gifted schools in other states in Malaysia. This year, the Ministry has started exploring and piloting programmes for high achievers and for gifted students using the research and partnerships established with private sectors and leading research institutions, which enables them to receive instruction from experts in their field while still participating in mainstream education. More accelerated options are open to gifted children at the secondary level, they are allowed to complete secondary school in 4 years rather than 5, and to take up more independent enrichment programmes that are research-related. In addition, gifted students will be regularly tested each year to ensure the programme is beneficial and has no adverse effects on their development. Their education programme will be flexible and tailored to their needs. In the future, the Ministry will refine the design of the pilot programmes and gradually scale up the pilot programmes nationwide.

Gifted children in Malaysia are perceived as those at the very end of the special needs spectrum. The search of Gifted and Talented children is a significant process but the molding of these gifted and talented children is more than just significant - it is a preponderant system that has no fixed formula. That is the major challenge Malaysia is facing. For gifted schools in Malaysia, there is still room for improvement in terms of its policy, curriculum, teaching methods, and assessment. What is important is that the improvements should mirror the statement by Renzulli (2021) that gifted programmes "... are intended to expand the reservoir of people who will contribute to creative innovations in the arts and sciences and to all areas of human endeavour designed to make the world a better place". Being green, Malaysia has yet to learn from other countries that have already strong establishments of Gifted Education programmes.

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