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A New Decade for Social Changes
Detecting outstanding students for projection in academic competitions

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Abstract. Upper secondary educational institutions have outstanding students in different areas of knowledge. Some of them show scientific skills, technological innovation, and others are considered high-performance athletes. They can enhance their abilities and face more demanding challenges by participating in academic and/or sporting events. The aim of this study was “to discuss the importance of the timely detection of outstanding students in upper secondary education academic units, as well as to analyse the factors that influence the achievement of their goals”. The research was conducted at the Guasave Daytime High School of the Autonomous University of Sinaloa (UAS), in the municipality of Guasave, Sinaloa, Mexico. It was designed as a case study, with an exploratory-explanatory analysis. A total of 455 surveys were administered to students. The academic unit has 3898 students, the data were captured in Google Forms to describe the attitudinal profile of high school students, ways of learning, strengths, and weaknesses to develop scientific skills. Interest in participating in important academic and sporting events was considered as activities to identify outstanding students. The results show the importance of implementing strategies that allow teachers to detect outstanding students in a timely manner. The dissemination of extracurricular activities was considered because students have the potential to develop their scientific and sporting talents. However, these activities have little dissemination among students. It is concluded that the Academic Units should have a greater dissemination of extracurricular activities and have a programme to detect outstanding students. It is important to train and guide teachers so that they can identify and channel outstanding students and be able to enhance their abilities.

Keywords. Scientific talents, sports skills, ways of learning, student aptitude

Introduction

The activities of students with above-average abilities have been a topic of analysis in educational settings internationally. Researchers have discussed how to identify such students, make the right intervention, and guide them (Sabbah & Aldin, 2022; Tou et al., 2023). In the
academic context, it is important that school authorities are aware of the implementation of strategies to identify outstanding students (Chavez Soto et al., 2014).

The Autonomous University of Sinaloa (UAS), an institution of upper secondary and higher education, located in the State of Sinaloa, Mexico, aims to foster scientific talent. Each year it promotes academic and sporting events to stimulate the aptitudes of its students, facilitating the development of their abilities and skills. This allows them to set more ambitious goals and encourages students to strive for a better future (UAS, 2021).

Educational institutions should have support programmes with indicators for outstanding or high-achieving students. Generally, schools have remedial programmes for students with academic deficiencies, but not for their outstanding young people (Alvarado Arellano et al., 2015).

The participation of teachers is crucial for the development of these programmes and the timely identification and attention of outstanding students (Valadez et al., 2019). It is important that teachers are constantly trained to achieve effective inclusion, and that students can develop their skills or abilities to the fullest.

The mechanisms used for the identification and attention of outstanding students may not be the most adequate (Morales-Nava et al., 2021). There are factors that influence or affect this process, such as social, family, emotional, financial, and other factors, and the incidence of outstanding students does not exceed 1.5% of the entire Mexican population (Medina Peñuelas, 2016).

Lack of time, interest, didactic and technological resources, as well as classroom activities, lack of computer equipment, high number of students, excessive workload and bureaucratic management processes are limiting factors when detecting, intervening and assessing outstanding students (Robles Ramirez et al., 2021). In order to successfully identify students, it is essential that teachers show mastery of the content, strategies and techniques required to direct this process of thought development and that students achieve independence in problem solving (Almeida Carazo J. & Almeida Carazo B., 2016).

It is necessary to transform teaching through innovations and sensitize teachers and students to the use of new teaching strategies, taking advantage of their explicit and implicit benefits (Hernández Briseño et al., 2019).

The promotion of academic and sporting activities at the Autonomous University of Sinaloa is part of the institutional development plan. For this reason, the application of strategies is required that allow the invitation or participation of students in activities that consolidate their skills and have an impact on their development and training. These events offer students new ways of viewing knowledge and developing generic and disciplinary competences.

The UAS, through the baccalaureate system, carries out annual competitions at regional and state level in the different areas of knowledge, of great interest in the formation of values and attitudinal competences of the students. Young people can express their talents and acquire new experiences by participating in this type of events. It is necessary to detect, promote and generate the economic and human resources that allow students to participate actively.

One of the strategies implemented are the scientific olympiads; a privileged instrument for detecting and consolidating intellectual talent, due to the rigorous selection process and preparation of the competitions. It is an important, high-impact effort in the teaching of various scientific disciplines (Navarro Cendejas, 2017).

For this reason, the timely detection and preparation of young people with skills in different areas of knowledge and their extra-class preparation are useful for the student to
project themselves in academic and sports competitions that provide experiences and increase the competitiveness of the academic unit (Žvan & Čoh, 2018).

For this reason, the aim of this paper was "to discuss the importance of timely detection of outstanding students in academic units of upper secondary education and to analyse the factors that affect the achievement of their goals".

To achieve this objective, an exploratory-descriptive study was carried out, which allowed us to know the academic opinion of the students of the Guasave Daytime High School of the UAS. A total of 455 questionnaires were applied to people between 15 and 19 years of age.

**Methodology**

The study was carried out at the Guasave Daytime High School Academic Unit of the UAS with students from first to third year, aged between 15 and 19 years old. A survey was applied through Google Forms, with key questions to make a contextual assessment regarding attitudinal profiles in relation to extracurricular activities and that affect as a reference to detect outstanding students.

The sample size was calculated using the statistical formula proposed by Torres et al. (2006), considering that the total population under study is known (see table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Population size School year 2022-2023</td>
<td>3898</td>
</tr>
<tr>
<td>Z</td>
<td>95% confidence level</td>
<td>1.96</td>
</tr>
<tr>
<td>P</td>
<td>Probability of success, or expected proportion</td>
<td>50%</td>
</tr>
<tr>
<td>Q</td>
<td>Probability of failure</td>
<td>50%</td>
</tr>
<tr>
<td>D</td>
<td>Accuracy</td>
<td>4.32%</td>
</tr>
</tbody>
</table>

Substituting values:

\[
n = \frac{N(Z)^2(p)(q) + Z^2(p)(q)}{(d)^2(N - 1) + Z^2(p)(q)} = \frac{3898(1.96)^2(0.5)(0.5) + (0.0432)^2(3897) + 1.96^2(0.5)(0.5)}{N - 1} = 454.7 \approx 455
\]

According to this calculation, the number of respondents is 455.

Four important aspects were analysed to identify the factors that influence student learning, and which form a central part of the objectives of this research, such as the attitudinal profile of high school students, ways of learning, strengths and weaknesses for the development of scientific skills, as well as interest in participating in important academic and sporting events.

**Analysis and discussion of results**

In the first item of the applied instrument, a basic questioning is made to find out the gender, age and grades of the students. The average age was 16.03 years with a standard deviation of ±0.83 for students between 15 and 19 years old. It is important to mention that in research it is necessary to consider the age of the study subjects in order to obtain information that is more accurate to reality (Aguilar Montoya & Delgado Morales, 2019).

With regard to the academic grades that the students surveyed are studying, there is a higher participation (48.35 %) of students in the first grade of bachelor's degree and 39.56 % in the second year (see figure 1), emphasising that in these academic grades, it is more feasible to
detect young people with outstanding aptitudes in a timely manner and to encourage them by including them in research projects or extracurricular academic and sporting activities.

For the timely detection of students with outstanding aptitudes, the teacher’s action in the classroom is fundamental; he/she must be observing the behaviour and the manifestation of intellectual, creative, socio-affective, artistic and/or psychomotor aptitudes always (Valadez et al., 2019).

A starting point for identifying this type of students is their self-perception. Figure 2 shows that 36.48% of the students surveyed have creative aptitudes; 27.25% excel intellectually, while 10.55% identify themselves as socio-affective people. According to Françoys Gagne’s model, students with this type of aptitude are able to stand out significantly from the social and educational group to which they belong (Covarrubias, 2018).

Cognitive, motivational, and personal variables are external factors that teachers can consider as strategies to identify students with outstanding aptitudes (Chávez Soto et al., 2014).

On teachers' judgements of high-ability students, they were more influenced by everyday school performance than by cognitive ability, even when teachers were instructed to differentiate between the two (Lavrijsen & Verschueren, 2020).

Another fundamental aspect for the detection of outstanding students is their preference for certain subjects or areas of knowledge, which can be detected during the development of the class and does not depend on a specific subject, since preferences are diverse.
and can be used by the teacher to guide the student to continue developing the skills he or she has shown.

![Pie chart showing skills distribution](image)

**Source:** own elaboration with data obtained from surveys applied to students

**Figure 2. Skills that most define me as a student**

Among the favourite subjects mentioned by the respondents were social sciences and humanities with 34.9%, chemical-biological sciences with 32.7% and physical-mathematical sciences with 20.9% (see Figure 3).

It is relevant to highlight that there are students who are intelligent in only one area, others have skills in 2 or more areas of knowledge. Outstanding students are part of a heterogeneous group, which must be considered when assessing them and determining their educational needs (Chávez Soto *et al.*, 2014).

The implementation and development of research projects that enhance scientific talent in schools is a determining factor in the search for students with potential. Outstanding students need the implementation of programmes to develop and enhance capacities in specific areas. Preparation and training above the general level is necessary, as well as opportunities to study according to their area of interest in depth or to interact with real intellectual peers (Sánchez Mercado, 2019).

The programmes and activities to be developed can be scientific workshops, project work, organisation of exhibitions, laboratory practices, participation in olympiads, teaching-learning strategies, talent detection activities, among others (Castellanos Simons *et al.*, 2019).
In relation to this information, the students surveyed indicated that the educational centre should undertake various actions, with workshops standing out with 23.52%, laboratory practices with 20.44%, as well as strategies to improve teaching-learning with 16.26%, with the interesting response that actions should be carried out to detect talent with 10.99% (see Figure 4).

An important point to highlight is that, after the detection of students with scientific talent, it is essential to move on to the development and assessment of talent. This has implications for intervention processes, because the availability of resources to attend to them and the opportunities of the context may vary, from detection to timely intervention and the development of potential, and it is also necessary to know the environment in which the student lives (Covarrubias Pizarro, 2018).
Parents of outstanding students should receive training and information that will allow them to diversify and perfect actions that do not limit the development of their children (Ramírez et al., 2022). Learning styles are a relevant aspect in the detection of the ways in which students learn under different conditions and social context (Zambrano et al., 2020).

When students were asked about how they learn, they considered visual learning with 42.86%, followed by auditory with 29.01% and kinaesthetic with 28.13% (see Figure 5). For students to respond to this variable, key aspects were described that allowed them to classify themselves according to the characteristics of the ways in which knowledge is acquired. It is important to point out that learning styles should be considered in the planning of teachers' activities, due to the diversity of ways of learning, implementing activities so that learning is integral and inclusive.

![Figure 5. Forms of learning present in the student community](source: own elaboration with data obtained from surveys applied to students)

Students are mostly auditory, followed by kinaesthetic and finally visual, according to a study developed at the Autonomous University of Quintana Roo (Carrillo Sangotuña et al., 2022). Similar values stand out in both visual and auditory sensory representation channels, with kinaesthetic being used by a lower percentage (Fascendini et al., 2021).

It is necessary to include the different ways of transmitting knowledge both visual, auditory, and kinaesthetic in academic activities to meet the needs of students and thus promote comprehensive and meaningful learning, which impact on the development of critical thinking skills and problem solving (Sanabria-Araya, 2023). Knowing these student characteristics when
it comes to learning will allow for the promotion of other educational alternatives and contexts (Fascendini et al., 2021).

When students were asked about their interest in participating in academic and/or sporting competitions inside and outside the university, 54.73% answered that they were interested (see Figure 6), which is important in making decisions to promote academic and sporting activities within the academic unit. Motivation for academic achievement allows outstanding students a greater disposition towards interest in a high mastery of intellectual tasks, which allows them to demonstrate their superiority (Valdés Cuervo et al., 2013).

![Figure 6. Interest in participating in academic and/or sports competitions inside and outside the University](image)

Source: own elaboration with data obtained from surveys applied to students

When questioned about the types of competitions in which they would like to participate and in which they feel most competent, 40.44% indicated that they would like to participate in none, however, this may be due to a lack of knowledge of the activities and projects that are developed on campus. It can also be seen that students are interested in participating in academic competitions offered by external institutions. This allows educational authorities and teachers to implement strategies to detect students interested in this type of academic events and to channel them according to their profile and the type of competition they prefer (see Figure 7).
Participation in academic competitions requires greater commitment from interested students, since during their training they have to attend extra-classroom courses at the institution and feel the natural pressure to participate in the competition.

Motivated by the above, they were asked about the obstacles they face when participating in this type of event. 48.79% felt embarrassed or nervous, 20.22% indicated that they do not find out about the competitions and 16.04% indicated that they miss classes when participating and therefore do not want their grades to be affected (see Figure 8).
It is important for educational institutions to address issues such as fear of failure because subjects oriented by fear of failure are generally insecure, which leads to a perception of being unable to succeed in activities and experiencing restlessness and anxiety (Moreno et al., 2019). Stress in these competitions is normal due to situations of pressure, anxiety and worry, which is normal at some point in the students’ school life (Maldonado de la Cruz, 2022).

The process of identifying outstanding students is crucial to address their educational needs, which requires accurate instruments and proven procedures to ensure the effectiveness and efficiency of screening (Tourón et al., 1999). It is important to implement instruments for screening, evaluating and refining them. The process begins with the nomination of students with outstanding abilities, followed by the assessment of these abilities and the formulation of an educational response specifically designed to meet their needs and abilities (Valadez Sierra, et al., 2020). In addition, it is necessary to implement actions that allow the identification of possible factors that impact on student performance and raise educational quality, and that enable an institution to develop a strategy to enhance the academic performance of its students (Yusof et al., 2022).

**Conclusions**

The Guasave Daytime Academic Preparatory Unit has a significant enrolment at the upper secondary level, which allows it to generate programmes to select outstanding students in the different areas of knowledge. 54.73% of the students surveyed are interested in...
participating in academic competitions. 42.86 % indicated that they learn visually, however, approximately 30% also learn aurally and kinaesthetically.

It is necessary that, through the tutoring programme, students are supported to manage their fear or nerves to participate more actively in academic competitions, since 48.79% are in this situation.

Although the Academic Unit has a programme for detecting outstanding students, it is necessary to train and guide the teacher to identify and guide the outstanding students, with the aim of enhancing their abilities.

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Bibliography


