The Opportunities of Alternative Education in the Psychoeducational Development of Children with Typical and Atypical Development: An Empirical Study on the TUMO Tirana Experience

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Abstract

This study explores whether alternative approaches to education, as applied in centers such as TUMO Tirana, can support the psychoeducational development and intrinsic motivation of children with typical and atypical development in Albania. Grounded in the theories of Piaget, Vygotsky, and Erikson on cognitive, social, and emotional development, as well as Deci and Ryan's Self-Determination Theory on competence, autonomy, and social relatedness, the research analyzes the impact of alternative education on these fundamental dimensions of child development.

The study involved 50 participants (25 children with typical development and 25 children with atypical development) who had completed a one-year cycle at TUMO. Data were collected through a mixed-methods approach: a structured questionnaire for parents on observed changes in behavior and emotional development at home, and semi-structured interviews with trainers to capture psychoeducational progress observed within the center's environment.

Findings indicate that participation in a free and creative learning environment such as TUMO increases children's sense of competence, autonomy, and social

connection, with particularly positive effects for children with atypical development. The study also identifies challenges and barriers that must be addressed to strengthen inclusive education in Albania, highlighting the importance of psychoeducational approaches in modern models of alternative education.

***Keywords**: alternative education, psychoeducational development, intrinsic motivation, typical and atypical development, self-determination theory*

Introduction

Adolescence is a crucial stage of development during which individuals experience significant cognitive, emotional, and social changes. According to Piaget's theory of cognitive development, youth at this age enter the stage of formal operations, becoming capable of abstract thinking and more systematic problem-solving (Piaget, 1952). Meanwhile, Vygotsky emphasizes the importance of the social context and the "zone of proximal development," where interaction with peers and mentors enables children to reach higher levels of learning with appropriate support (Vygotsky, 1978). These perspectives underline that active and collaborative learning environments can accelerate the cognitive and social development of adolescents.

Psychosocial and motivational needs are also particularly important during adolescence. Erikson argues that at this stage, young people are in the process of forming their identity and resolving the "role confusion" crisis, where competence and self-esteem play a central role (Erikson, 1968). An environment that offers opportunities for success and skill development can prevent feelings of inferiority. Likewise, Deci and Ryan's Self-Determination Theory highlights that when basic needs for autonomy, competence, and social relatedness are met, students show higher intrinsic motivation and more sustained engagement in learning (Ryan & Deci, 2000). This suggests that an educational program fostering independence, skill development, and social interaction would be especially motivating for adolescents.

Children with atypical development—a term in this study referring to those with neurodevelopmental disorders such as Autism Spectrum Disorder (ASD) or Attention Deficit Hyperactivity Disorder (ADHD)—face particular challenges in traditional school environments. However, inclusive practices in education have shown that integrating these students with their typically developing peers can bring benefits to both groups. International organizations such as UNESCO prioritize inclusive education, stressing that every child, regardless of ability, should have equal opportunities for development (UNESCO, 2020). Moreover, alternative learning environments that offer diverse activities may resonate with

students' multiple intelligences (Gardner, 1983), allowing children with different aptitudes and profiles to excel in various areas. The TUMO educational program is an example of such an alternative approach: it provides a rich extracurricular curriculum of creative projects in technology and the arts (programming, robotics, graphic design, music, etc.), where young people pursue personalized learning paths according to their interests. Such an environment is expected to encourage active exploration (in line with Piaget's constructivist theory) and creative collaboration (in Vygotsky's spirit), while simultaneously enhancing adolescents' self-confidence and intrinsic motivation (Erikson, 1968; Ryan & Deci, 2000).

In this context, the aim of this study is to evaluate the psychoeducational impact of the TUMO program on adolescents with typical and atypical development. Specifically, we focus on the development of social skills (e.g., communication and cooperation), emotional skills (self-confidence and sense of competence), and motivation (initiative in learning) after a period of participation in this program. We also assess parents' attitudes (satisfaction and willingness to recommend the program) as well as the impressions of TUMO trainers regarding students' progress. Drawing both on existing literature and empirical data from parent surveys and trainer interviews, the goal is to understand whether and how TUMO's alternative approach contributes to adolescents' personal development compared to expectations from traditional education.

Literature Review

For many years, educators and researchers have experimented with alternative educational approaches beyond the traditional classroom, aiming to foster creativity and active student engagement. Seymour Papert argued that the use of technology and project-based learning can empower children to learn more deeply by constructing tangible artifacts of their knowledge (Papert, 1980). Along these lines, Resnick (2017) promoted the concept of the "lifelong kindergarten," where learning occurs through projects, passion, peers, and play—principles also present in the TUMO program. Empirical research shows that participation in structured after-school programs can lead to meaningful benefits for young people. A meta-analysis by Durlak et al. (2010) found that after-school programs designed to support children's personal and social development had positive effects on social skills, self-esteem, and prosocial behavior, compared to peers who did not participate. These findings support the idea that an alternative, practice-oriented, and enjoyable learning environment can help children acquire skills not easily developed during regular school hours.

Other studies have specifically examined the effects of extracurricular participation among adolescents. Larson (2000) emphasized that voluntary

activities (such as clubs and creative projects) play an important role in the development of initiative, since they require young people to set personal goals and persevere in achieving them—something often absent in tasks imposed from above. In a longitudinal study, Fredricks and Eccles (2006) found that adolescents who regularly participated in extracurricular activities showed higher levels of social competence and academic achievement compared to those who were not involved. Although some of these differences may be partly attributed to self-selection factors (e.g., more motivated children being more likely to participate), the findings suggest that a stimulating and opportunity-rich environment, such as that of alternative programs, positively impacts youth development.

Regarding inclusive education, the literature strongly supports the idea that students with special needs can benefit from learning alongside their typically developing peers, while the latter do not experience a decline in achievement—on the contrary, they may develop social competencies such as empathy and understanding. A large-scale analysis by Baker, Wang, and Walberg (1995) reported generally positive results of including students with difficulties in mainstream classes, including improvements in academic performance. Similarly, Staub and Peck (1995) noted that the presence of students with disabilities or developmental disorders does not negatively affect their typical peers; rather, it provides opportunities for learning tolerance and practicing helpful behaviors. On the other hand, students with atypical development can benefit from the positive social and academic models of typical peers. Research has also shown that interventions focused on these children's motivation and interests can be particularly effective in inclusive environments. For example, Koegel et al. (2012) found that when children with autism were included in regular classes and educators used motivational strategies (such as allowing preferred activity choices and applying positive reinforcement), these children displayed increased engagement and positive interactions during lessons.

In summary, the existing literature suggests that: (1) alternative and extracurricular programs, especially those based on technology and creative projects, can positively influence the cognitive, social, and emotional development of young people; and (2) inclusive learning environments can maximize benefits for children with and without special needs, particularly when supported by personalized methods that enhance motivation. These theoretical and empirical findings provide an important framework for interpreting the results of our study on the TUMO program, which combines elements such as personalized learning, project collaboration, and the inclusion of children with diverse developmental backgrounds. The following sections present the methodology adopted and the main findings observed.

Methodology

Participants

The study included 50 parents of adolescents aged 12–15 years whose children had attended the TUMO program. Of these, 25 were parents of children with atypical development (diagnosed with neurodevelopmental disorders such as autism or ADHD), and 25 were parents of children with typical development (no developmental diagnoses). The child sample was almost evenly balanced by gender in both subgroups (in the atypical group, 52% were girls; in the typical group, 44% were girls). The average age of the children was 13.3 years. All adolescents had participated in the TUMO program for at least several months: about one-third of the children in each group had attended for less than six months, while the rest had attended for 6–12 months or longer. In addition to the parents, five TUMO trainers (instructors) were interviewed, each with between one and four years of experience implementing the program with these children.

Instruments

Data were collected using a combination of quantitative and qualitative methods. Parents completed a questionnaire regarding their child's development before and after participation in the TUMO program. Key items included parental evaluations of the child's communication skills (e.g., how open or withdrawn they were in interacting with others), level of self-confidence, and degree of participation in social activities prior to joining TUMO, as well as observed changes after participation (e.g., whether communication improved, whether self-confidence increased). For each of these domains, parents selected a categorical response (e.g., "very withdrawn," "moderate," "very sociable" for communication; or "increased," "remained the same" for observed change). The questionnaire also included items on new developments during the period (e.g., interest in new areas such as technology or art, initiative in creative activities), the perceived overall impact of the program on the child's development ("positive," "neutral," or "negative"), and newly observed behaviors or attitudes. At the end of the questionnaire, parents were asked to rate their satisfaction with the TUMO program ("very satisfied," "satisfied," etc.), whether they would recommend it to other parents, and to provide a concrete example from daily life in which they noticed a positive change in their child that they attributed to the TUMO experience.

For the qualitative component, semi-structured interviews were conducted with TUMO trainers. A guide was developed to encourage trainers to share their experiences regarding: student behavior during the first months in the program,

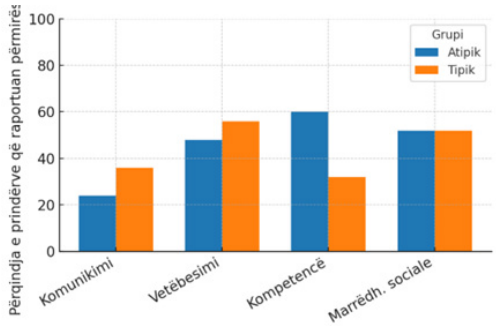
observed changes over time (particularly in social cooperation), differences in learning pace between students with typical and atypical development, the evolution of self-initiative and motivation after several months in the program, student engagement during the self-learning phase compared to group workshops, specific social, emotional, or cognitive improvements observed in children with atypical development, challenges encountered in supporting them, and trainers' overall perspectives on the impact of TUMO's alternative methods on adolescents' personal development. Interviews were audio-recorded with participants' consent and later transcribed for analysis.

Procedure

Parent participants were recruited through the TUMO center via an announcement distributed by the staff. The questionnaire was completed electronically and anonymously, after a minimum of six months of program participation (most parents filled it out at the end of the academic year). All responses were kept confidential. Trainer interviews were conducted individually at the TUMO center, each lasting 30–45 minutes. For the quantitative analysis, descriptive statistics were used: percentages of parents reporting positive or neutral changes for each indicator, means, and distributions of demographic characteristics. No inferential statistical tests were applied, as the aim was an exploratory, descriptive evaluation of key trends in the data. Qualitative data from the trainer interviews were analyzed using thematic analysis, identifying the main themes mentioned (e.g., increased cooperation, attention challenges, improved self-confidence) and extracting illustrative quotations for each theme.

Results

FIGURE 1. Percentage of parents reporting improvement in their children's communication, self-confidence, sense of competence, and social relationships after attending the TUMO program. Children with typical and atypical development are represented respectively in orange and blue.



Results from the parent surveys indicate a generally positive impact of the TUMO program on several key aspects of child development, though with some differences between the typical and atypical groups. Communication skills appeared unchanged for most children, but some parents reported improvements. Specifically, approximately 36% of parents of neurotypical children observed that their child became more open and communicative after the program, compared to about 24% of parents in the atypical group who reported such improvement. For the majority of children in both groups (about 64% in the atypical group and 64% in the typical group), communication was rated as "unchanged" following the program—no parent reported deterioration in this area.

Regarding self-confidence, about half of parents in both groups noted an increase in their children's confidence after attending TUMO. In particular, 48% of parents of children with atypical development reported improved self-confidence, a percentage similar to that of the typical group (56%). The remaining parents in both groups stated that their child's level of confidence remained the same; no parent reported a decrease in confidence. These findings suggest that overall, about half of the children experienced a boost in self-assurance, while the other half maintained their previous level.

A particularly interesting result emerged concerning the sense of competence—that is, how capable children felt in undertaking new tasks after this experience. Parents of children with atypical development reported more improvement in this area than parents of typically developing children. Specifically, 60% of parents in the atypical group stated that their child now felt more competent and capable in their activities (e.g., acquiring new skills and having the confidence to use them), while 40% did not notice significant change. In contrast, only 32% of parents of neurotypical children reported an increase in their child's sense of competence, while the majority (68%) noticed no change. This difference suggests that the program may have had a particularly important effect on children with atypical development in terms of self-assessment of abilities—perhaps because these children, who may have initially had lower confidence, had opportunities to experience success and feel capable within a supportive environment.

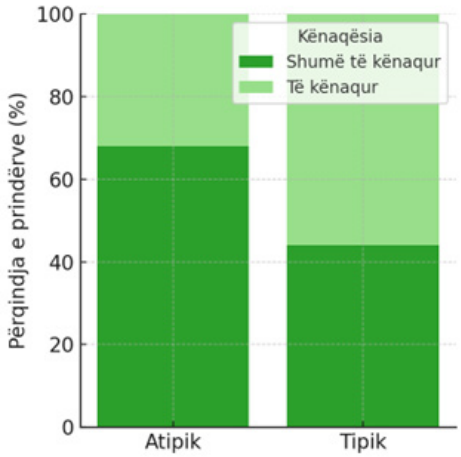
As for social relationships, about 52% of parents in both groups reported that their child became more sociable and cooperative with peers after several months at TUMO. The other half of parents (48% in both groups) did not notice substantial changes in their child's social behaviors. It is important to note that no parent, in either group, reported a deterioration in social behaviors; children either maintained the same level of social communication or improved somewhat by becoming more open to others.

Regarding children's initiative—that is, their tendency to take the lead in starting projects or engaging in activities without adult prompting—the data from parents were unanimously positive. Every parent, in both the atypical and

typical groups, reported that their child demonstrated an increase in personal initiative after participating in TUMO. The difference between groups lay only in the degree of this increase: the majority of parents of neurotypical children (64%) stated that their child now takes "much more" initiative than before (e.g., starting new projects or tasks at home independently, exploring new hobbies), while the rest (36%) observed "slightly more" initiative. Among children with atypical development, the picture was similar, though somewhat less pronounced: 52% of parents noted a large increase ("much more"), while 48% saw a modest increase ("slightly more"). No parent in either group reported that their child continued to show the same or less initiative than before—an indication that the program fostered active participation and self-motivation in all children, regardless of developmental status.

Finally, concerning overall child development, parents of the typical group tended to evaluate the program's impact more positively: 64% believed that TUMO had a positive effect on their child's development (in terms of new skills, maturity, or life direction), while 36% rated the impact as neutral (neither positive nor negative). Among parents of atypical children, 44% reported a "positive impact" on their child's development, and 56% "neutral." No parent in either group described the impact as negative, consistent with the finding that no regressions were observed in any of the evaluated domains.

FIGURE 2. Distribution of parental satisfaction with the TUMO program, by group. Each vertical bar represents one group of parents (left: parents of children with atypical development; right: parents of children with typical development). The dark shade represents the percentage of parents "very satisfied," while the lighter shade represents those "satisfied."



The collected data revealed very high levels of parental satisfaction with the TUMO program. No parent from either group expressed dissatisfaction; all were

either "satisfied" or "very satisfied" with their child's experience at the center. Among parents of children with atypical development, 68% reported being "very satisfied" with the program, while 32% were "satisfied." This indicates that more than two-thirds of these parents rated the quality and impact of the program at the highest level. Parents of typically developing children also expressed very positive perceptions, though distributed somewhat differently across the two categories: 44% were "very satisfied" and 56% "satisfied." Thus, in both cases, 100% of parents expressed satisfaction, with a tendency for parents of children with special needs to be even more enthusiastic (possibly because improvements in their children were particularly meaningful, as mentioned earlier). Furthermore, all parents without exception—both those of atypical and typical children—stated that they would recommend the TUMO program to other parents. This result clearly demonstrates the universally positive perception of participating families regarding the value of the program.

Beyond the quantitative evaluations, results from trainer interviews provided highly meaningful qualitative insights into how the learning process unfolds at TUMO and its impact on students. Trainers generally confirmed that most children, when first starting the program, were curious but somewhat withdrawn. "In the first months, many students are quiet and reserved; they are curious, but often hesitant to take initiative," observed one trainer (Trainer 1). This aligns with expectations, given that a new environment and unfamiliar methodology require an adjustment period. However, noticeable changes emerged over time. According to trainers, after several months, students began to shed initial insecurities and engage more actively with one another. "Absolutely! After the first months, groups become more connected and cooperative. Even the more withdrawn children participate more naturally," emphasized another trainer (Trainer 2). This growth in collaboration was consistently mentioned: while many children initially preferred working individually, over time they began sharing ideas, seeking help from peers, and collaborating more effectively in groups.

Trainers noted differences in learning pace between typically developing and atypically developing children, but emphasized that each group had its own strengths. "Students with typical development often complete routine tasks more quickly," explained one instructor, "whereas children with ASD or ADHD sometimes follow the steps in very detailed ways, which slows them down, but the results they produce are very high-quality" (Trainer 2). This observation was echoed by others, who highlighted that children with atypical development, when they find a topic or project they are passionate about, work with remarkable focus and often produce highly creative solutions. "The quality of work of children with ASD is very high in detail," said a trainer with three years of experience (Trainer 3), illustrating why it is important to provide these children with space and time to excel at their own pace. On the other hand, typically developing children, though

quicker with tasks, benefit from this diversity of rhythms, as they learn patience and cooperation with peers who have different working styles. This inclusive dynamic seems to teach all children to value diverse contributions within the group.

A central theme emerging from the interviews was the growth of self-initiative and intrinsic motivation among students after spending time in the program. "After 4–6 months, many students, even those who were initially passive, begin to take initiative in their projects," stated one trainer (Trainer 1). Another illustrated this with an example: "After a few months, some children request to create projects outside the regular program" (Trainer 2), showing that once passion is ignited, students continue exploring even in their free time. According to trainers, TUMO's self-learning platform allows each child to follow their own pace and interests during lab hours, while workshops and group projects foster collective enthusiasm and push children out of their "individual shells." "During self-learning they are quieter and more introspective, while in workshops they show more energy, especially when working in groups," explained one instructor (Trainer 1). This interplay between individual and group phases appears to help children develop a balance between independence and collaboration.

Trainers also reported social, emotional, and cognitive improvements among children—particularly those with atypical development—during their time at TUMO. According to one trainer: "I have seen great improvement in self-confidence and social skills. They learn to express their ideas" (Trainer 1), describing how children with difficulties gradually became more outspoken and confident. Another emphasized: "Much more tolerance for differences and a greater capacity to ask for help" (Trainer 2) as two key changes among some students with autism. This suggests that a flexible environment such as TUMO helped these children adapt better to change and feel comfortable seeking support when facing challenges, rather than withdrawing. Trainers observed that, over time, children with atypical development began expressing themselves more freely and integrating more naturally into groups. "Self-expression improves significantly. They speak more openly about their ideas and feel more empowered," said the trainer with three years of experience (Trainer 3), highlighting that even children who initially seemed very withdrawn eventually found their voice.

These improvements did not come without challenges: some trainers mentioned the difficulty of maintaining sustained attention among certain students with ADHD or the need to adapt teaching approaches to different learning styles within the same group (e.g., some children require more structured guidance, others prefer greater creative freedom). "Sometimes it is a challenge to keep their attention for long periods or adapt to their different learning styles," admitted one trainer (Trainer 1). Nonetheless, TUMO staff emphasized that they addressed these challenges by allowing children to work on topics they were truly passionate

about and by providing individualized support when necessary, without restricting creativity.

In summary, trainers unanimously agreed that TUMO's alternative approach has a very positive impact on adolescents' personal development. "I think it has a deeply positive influence. Children learn to be more independent, more creative," said one of them (Trainer 1) when asked to assess the TUMO methods overall. Another noted that the program "uniquely supports the development of mental flexibility and creativity" (Trainer 2), while a trainer with more than three years of experience said that the methods are "extremely effective in fostering a positive relationship with learning" (Trainer 3). These opinions align with the parental enthusiasm observed in the surveys. To illustrate the impact on an individual level, trainers provided concrete examples from their work: one described "a boy with ADHD who at first could barely complete a simple project; now he creates small applications and explains the process with passion" (Trainer 2). Another mentioned "a student who previously avoided group work, [who] now is the first to offer help to peers" (Trainer 4). Another case was "a very shy boy at the beginning, [who] after eight months led a group project to create a video game" (Trainer 3). These success stories reflect the transformative potential of a supportive learning environment: children who initially hesitated later assumed leadership roles; children who struggled with concentration discovered their passion and excelled.

Discussion

The results of this study clearly show that participation in the alternative educational program TUMO is linked to positive developments across several dimensions for adolescents, both those with typical development and those with atypical development. These findings align with existing literature on the benefits of experiential and inclusive learning. The observed increase in initiative among all students after several months in the program reflects what Larson (2000) describes as the outcome of engaging in activities that young people perceive as meaningful and under their own control. The fact that many parents reported improvements in self-confidence and competence in their children, particularly among those with atypical development, is highly significant in the context of adolescents' psychosocial development (Erikson, 1968) and Bandura's theory of self-efficacy (Bandura, 1997). According to Erikson, adolescents need to feel successful and competent to navigate the process of identity formation; the TUMO program seems to have provided them with a stage to test themselves and gain that sense of capability. Meanwhile, the concept of self-efficacy (Bandura, 1997) – the individual's belief in their ability to organize and execute the actions required to achieve goals – is reinforced when young people see they can succeed in new

and challenging tasks. The reported improvements in the sense of competence suggest precisely a growth in self-efficacy, which may lead to multiple positive effects in the future (e.g., greater readiness to engage in academic or professional challenges).

From the perspective of learning theories, the successes observed in children at TUMO can be explained by the combination of optimal learning conditions that the program provides. Both the constructivist and socio-cultural approaches are evident: children learn by actively experimenting with technological and artistic projects and by interacting with mentors and peers. This structure reflects the key ideas of Piaget and Vygotsky, who respectively emphasize the role of active learning and social collaboration in development (Piaget, 1952; Vygotsky, 1978). In light of these theories, it is unsurprising that children at TUMO not only gained technical skills but also became more sociable and cooperative: when children work hands-on and learn by doing, knowledge takes on personal meaning and enthusiasm for learning grows (Papert, 1980; Resnick, 2017). Likewise, the mentoring and support that TUMO trainers offered each student – as seen in their comments on adapting to individual needs – created a zone of proximal development where children could overcome difficulties with minimal help and achieve results they would not have reached on their own (Vygotsky, 1978). This may explain why even children with previous challenges (e.g., in focus or communication) were able to carry out complex projects and successfully present their ideas.

Another key factor is intrinsic motivation. The TUMO approach – giving students autonomy in choosing courses/activities and the chance to follow their passions (such as programming, animation, robotics, or music) – likely fulfilled their needs for autonomy and competence, which, as self-determination theory predicts, enhances intrinsic motivation (Ryan & Deci, 2000). The increase in self-initiative among students, observed by both parents and trainers, is a clear indicator of intrinsic motivation: children began to undertake projects not because someone asked them to, but because they wanted to do so. This situation fulfills the conditions that Deci and Ryan consider ideal for motivation: children felt like authors of their own learning, they felt competent as they acquired new skills, and they interacted with others in a supportive community (trainers and peers) – the three components that drive intrinsic motivation according to this theory (Ryan & Deci, 2000). Moreover, the high satisfaction of parents and their eagerness to recommend the program indicates that even from the external (family) perspective, this approach is seen as valuable and meaningful for the child, which likely strengthens the adolescents' motivation to continue.

When comparing groups of typically and atypically developing children, we find both similarities and interesting differences. Both groups benefited in significant ways, and there was no indicator where children with atypical development experienced regression or worsening – a concern sometimes raised by skeptics of

inclusive education. On the other hand, we observed that neurotypical children showed somewhat more improvements in communication skills, and their parents more often perceived an overall positive developmental impact, compared to the atypical group where changes were more frequently reported as "neutral." This may be related to the fact that typical children found it easier to benefit quickly from a rich social environment and may have had more visible room for growth in their parents' eyes (e.g., a typical child who was already sociable became even more communicative at TUMO, which is immediately noticeable). Meanwhile, children with special needs may have faced more complex challenges in communication that cannot be fully addressed in just a few months, so parents may have reported "neutral" when changes were minor. Literature shows that children with autism, for instance, may require ongoing and specialized interventions for social development, beyond a general program (Koegel et al., 2012). Thus, our finding that only half of parents of atypically developing children observed improvements in socialization may reflect the gradual nature of their progress – progress that may require longer observation periods to become clear.

On the positive side, emotional and motivational aspects showed particularly pronounced benefits for adolescents with atypical development. The increase in competence and self-confidence reported among the majority of these students suggests that the program functioned as a "safe success zone," where they could excel in specific domains (e.g., technology or art) and demonstrate their abilities both to themselves and to others. This aligns with Gardner's theory of multiple intelligences (Gardner, 1983), which posits that a child who may not thrive within a traditional curriculum primarily focused on verbal and logical-mathematical skills can display remarkable talent in other domains (such as visual-spatial skills, musicality, or computational logic). By offering a wide range of fields, the TUMO program enables atypical students to engage with areas where they have talent or interest. For a child with social difficulties, for instance, discovering proficiency in animation or robotics may transform self-perceptions—from feeling "inadequate" in the school context to feeling "capable" in a specific field—leading to a measurable increase in self-esteem. These mechanisms may help explain why parents of atypical children were among the most enthusiastic about the program and its impact.

Another relevant aspect is the reciprocal benefit of inclusive environments, which emerged from trainer comments and parental evaluations. Our data did not reveal any negative effects on typically developing students arising from the presence of atypical peers. On the contrary, typical students experienced improvements equal to, or in some cases greater than, those of atypical students. This finding aligns with previous studies (Baker et al., 1995; Staub & Peck, 1995), which demonstrate that inclusion does not harm the outcomes of typical learners. Trainers further observed that typical students developed increased tolerance

and understanding by learning to collaborate with peers who had different needs. Although this aspect was not directly measured, such "invisible" benefits are consistent with the literature on inclusive education: when successfully implemented, inclusive classrooms frequently foster mentoring skills, patience, and heightened empathy among typical students (Staub & Peck, 1995). From an educational policy perspective, these findings highlight the broader societal value of initiatives such as TUMO, which aim to be inclusive. A society benefits when children are taught from an early age to coexist and collaborate within diverse contexts.

Despite the encouraging results, certain limitations of this study and their implications warrant discussion. First, the absence of a control group of adolescents not enrolled in the TUMO program means that, although reported improvements are substantial, we cannot conclude with absolute certainty that they are attributable solely to the program. Some changes—particularly in self-confidence or communication—may also partly reflect natural maturation during adolescence. Nevertheless, the specific nature of the changes (e.g., immediate increases in initiative or newly developed interests in technology) and the fact that parents explicitly attributed these developments to TUMO strengthen the case for the program's central role. Another limitation is that assessments relied on the perceptions of parents and trainers, which may contain elements of subjectivity or enthusiasm bias. For example, highly satisfied parents might have been more inclined to notice positive changes. Although interviews with trainers and parents' open-ended responses offered consistency and illustrative examples supporting the validity of the reported improvements, future research would benefit from incorporating more objective measures (e.g., standardized assessments of social skills pre- and post-program, or comparisons with matched groups of adolescents not attending TUMO). Moreover, the timeframe considered (typically 6–12 months) allows for discussion of short- to medium-term effects, but the long-term sustainability of these changes remains unknown. Following the same group of adolescents over one or two years would be valuable to determine whether, for instance, self-confidence gained at TUMO translates into success in other domains such as school performance or peer relationships outside the program.

In sum, this study provides clear evidence that an alternative learning environment enriched with technology, creativity, and inclusivity can be highly beneficial for adolescents. The documented benefits—ranging from increased digital competencies to enhanced social skills and motivation—are aligned with contemporary educational priorities aimed at equipping young people with 21st-century skills (e.g., creativity, collaboration, problem-solving) and fostering a positive attitude toward lifelong learning. The TUMO program appears to meet these objectives through a methodology that is engaging and student-driven, an element often difficult to replicate in formal education systems. Furthermore, its

success with a heterogeneous group of students, including those with ASD and ADHD, reinforces the argument that individualized and flexible instruction, combined with high expectations for all, can help narrow learning experience gaps between students of different abilities.

Conclusions and Recommendations

In conclusion, the findings of this study indicate that the alternative educational program TUMO has a positive and multidimensional impact on adolescent development—both for typically developing youth and those with atypical development. Improvements were observed in social skills (communication and collaboration), emotional capacities (self-confidence and sense of competence), and motivation (self-initiative) following participation in the program. Parents reported high levels of satisfaction and shared personal success stories, while trainers confirmed the observed positive changes and provided concrete examples of student transformation. No negative effects were reported from the mixing of groups; on the contrary, the inclusive environment proved valuable for all participants. These results strongly support educational theories that emphasize active, differentiated, and social learning, and they demonstrate that alternative methods can effectively complement formal education.

Based on these findings, several practical and research-oriented recommendations emerge:

- **Expansion of similar programs**: Educational institutions and community centers should consider developing or extending alternative programs such as TUMO, which allow young people to pursue their passions in technology, art, and other creative fields. Participation should be particularly encouraged for students who show low motivation in traditional curricula or who have special educational needs, as the potential benefits are significant.
- **Integration of effective practices into public schools:** Lessons drawn from TUMO's methodology—such as project-based learning, technology use, and individualized approaches—can be gradually incorporated into regular school curricula. This could include the introduction of project modules, after-school clubs mentored by teachers, or innovation labs within schools where students work on projects similar to those at TUMO.
- **Teacher and trainer preparation**: Investment in teacher training for inclusive and student-centered pedagogies is recommended. As this study showed, the role of the trainer is critical to student motivation and success; trainers must be flexible, supportive, and able to adapt to diverse learning styles. Teacher education programs could include modules on special

education and educational technology to better equip future educators to support diverse classrooms with innovative methods.

- **Parental engagement:** Since parents are essential partners in child development, programs such as TUMO should continue to communicate regularly with parents about their child's progress and provide guidance on how to reinforce that progress at home. For example, if a child develops a new interest in robotics, parents might be encouraged to support this interest through complementary activities at home or within the community.
- **Further research:** Future studies employing more rigorous designs—such as comparisons with control groups of children not attending TUMO or attending alternative programs—would be valuable to confirm the magnitude of TUMO's impact and to examine the durability of its benefits. Longitudinal research following students after completing the program could shed light on long-term outcomes in academic success and social development. Additionally, further qualitative research could provide deeper insight into the individual experiences of adolescents with atypical development in such environments, identifying the specific factors that support their progress most effectively (e.g., one-to-one mentoring, structured versus flexible learning conditions).

References

1. Baker, E. T., Wang, M. C., & Walberg, H. J. (1995). The effects of inclusion on learning. Educational Leadership, 52(4), 33–35.
2. Bandura, A. (1997). Self-efficacy: The exercise of control. W. H. Freeman.
3. Durlak, J. A., Weissberg, R. P., & Pachan, M. (2010). A meta-analysis of after-school programs that seek to promote personal and social skills in children and adolescents. American Journal of Community Psychology, 45(3–4), 294–309. https://doi.org/10.1007/s10464-010-9300-6
4. Erikson, E. H. (1968). Identity: Youth and crisis. W. W. Norton & Company.
5. Fredricks, J. A., & Eccles, J. S. (2006). Is extracurricular participation associated with beneficial outcomes? Concurrent and longitudinal relations. Developmental Psychology, 42(4), 698–713. https://doi.org/10.1037/0012-1649.42.4.698
6. Gardner, H. (1983). Frames of mind: The theory of multiple intelligences. Basic Books.
7. Koegel, R. L., Matos-Fredeen, R., Lang, R., & Koegel, L. K. (2012). Interventions for children with autism spectrum disorders in inclusive school settings. Cognitive and Behavioral Practice, 19(3), 401–412. https://doi.org/10.1016/j.cbpra.2010.11.003
8. Larson, R. W. (2000). Toward a psychology of positive youth development. American Psychologist, 55(1), 170–183. https://doi.org/10.1037/0003-066X.55.1.170
9. Papert, S. (1980). Mindstorms: Children, computers, and powerful ideas. Basic Books.
10. Piaget, J. (1952). The origins of intelligence in children. International Universities Press.
11. Resnick, M. (2017). Lifelong kindergarten: Cultivating creativity through projects, passion, peers, and play. MIT Press.

12. Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68
13. Staub, D., & Peck, C. A. (1995). What are the outcomes for nondisabled students? Educational Leadership, 52(4), 36–40.
14. UNESCO. (2020). Inclusion and education: All means all. Global Education Monitoring Report. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000373718
15. Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.

Annexes

Annex 1.1: QUESTIONNAIRE – PARENTS

Section A: Basic Information

1. Child's age: ____
2. Gender: ☐ Male ☐ Female ☐ Other
3. Does the child have a developmental diagnosis? ☐ Yes (please specify: _____) ☐ No
4. Duration of attendance at TUMO:

o ☐ Less than 6 months
o ☐ 6–12 months
o ☐ More than 12 months

Section B: Behavior prior to attending TUMO

5. Before attending TUMO, how would you describe your child's level of social communication?

- ☐ Very withdrawn
- ☐ Moderately communicative
- ☐ Very sociable

6. Before attending TUMO, how would you describe your child's level of self-confidence?

o ☐ Very insecure
o ☐ Moderately confident
o ☐ Very confident

7. How often did your child engage in creative or technological activities during free time?

o ☐ Very rarely
o ☐ Occasionally
o ☐ Very often

Section C: Observed changes after attending TUMO

8. After attending TUMO, how has your child's social communication changed?

- ☐ Worsened

- ☐ Remained the same
- ☐ Improved

9. After attending TUMO, how has your child's self-confidence changed?

o ☐ Decreased
o ☐ Remained the same
o ☐ Increased

10. Your child now demonstrates more:

- ☐ Initiative to participate in activities
- ☐ Interest in technology or art
- ☐ Self-motivation to pursue personal projects

11. How would you evaluate TUMO's impact on your child's overall development?

- ☐ Negative
- ☐ Neutral
- ☐ Positive

12. What concrete changes have you observed in your child's behavior or attitudes? (Open-ended)

Section D: Overall Satisfaction

13. How satisfied are you with your child's experience at TUMO?

- ☐ Very dissatisfied
- ☐ Dissatisfied
- ☐ Neutral
- ☐ Satisfied
- ☐ Very satisfied

14. Would you recommend participation in TUMO to other children?

- ☐ Yes
- ☐ No

Section E: Sense of competence, autonomy, and social connectedness

15. After participating in TUMO, do you believe your child feels more competent to complete technological or artistic projects?

- ☐ Yes
- ☐ No
- ☐ No noticeable change

16. Do you observe that your child now takes more personal initiative (e.g., starting projects, solving problems without adult help)?

- ☐ Yes, much more
- ☐ Slightly more
- ☐ No change
- ☐ Less than before

17. How would you describe your child's social relationships with peers after the TUMO experience?

- ☐ More isolated
- ☐ No change
- ☐ More open and cooperative

18. Do you believe that the TUMO experience helped your child feel: (You may select more than one)

- ☐ That they have valuable skills and competencies
- ☐ That they can make independent decisions about their learning path
- ☐ That they belong to a welcoming community
- ☐ None of the above

19. If you wish, please share an example where your child demonstrated growth in self-confidence, autonomy, or social relationships after participating in TUMO:

Annex 1.2: INTERVIEW – TRAINERS

Basic Information

1. How long have you been working at TUMO?
2. In which fields do you teach or mentor (e.g., programming, animation, etc.)?

Observations of student behavior

3. When a child first begins attending TUMO, what behaviors do you typically observe during the initial months?
4. Do you notice visible changes in how students collaborate with others over the course of the year? Can you provide examples?

Progress in learning

5. Are there differences in the pace at which students with typical and atypical development complete activities? How are these differences expressed?
6. Do you observe an increase in self-initiative (intrinsic motivation) among students after several months of attendance?
7. How does their engagement differ between the self-learning phase and the workshop/project phase?

Reflections on psychoeducational benefits

8. For children with atypical development (e.g., ASD, ADHD), what social, emotional, or cognitive improvements have you most frequently observed?
9. What challenges do you face in supporting these students during the learning process?
10. Overall, how do you think TUMO's alternative methods influence adolescent personal development?

11. In your experience, have you observed that TUMO students develop greater awareness of their technical or creative competencies? Can you provide examples?
12. Do you find that, after several months at TUMO, students take more personal initiative for the projects they pursue?
13. How does the TUMO learning environment influence students' sense of belonging and collaboration? Have you seen cases where more reserved students integrated socially through activities?
14. In what ways do you believe TUMO contributes to adolescents' intrinsic motivation to learn and create?