The parents' Opinions regarding the Usefulness of Establishing the Configuration of the Profile of Intelligence of the Pupils, Using a Digital Application based on the Content of the Theory of Multiple Intelligences

Dragoș Grigoriu, Luana David, Mușata Bocoș, Diana-Crina Marin, Cristian Dan Opariuc, Ciprian Baciu

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Dragoș Grigoriu [a*]**, Luana David** [a]**, Mușata Bocoș** [b]**, Diana-Crina Marin** [c]**, Cristian Dan Opariuc** [d]**, Ciprian Baciu** [b]

[a] *Supersona SRL, 43, 11-11A, George Enescu Street, Bucharest, Romania*
[b] *Faculty of Psychology and Educational Sciences, Babes-Bolyai University, 7 Sindicatelor Street, 400015, Cluj-Napoca, Romania*
[c] *"Pavel Dan" Theorethical Highschool, 17 1 December Street, 405100, Câmpia Turzii, Romania*
[d] *Faculty of Law and Administrative Sciences, Ovidius University, 124 Bulevardul Mamaia, Constanța, Romania*

Corresponding author: dragos@supersona.me

Abstract	
Keywords: Multiple Intelligences, Assessment, Digital Application, School-Family Partnership, Profile of Intelligence, Vocational Counselling	Recent studies have shown that the educational approaches based on the Theory of Multiple Intelligences are efficient and should be applied frequently in the classroom. Through this study, we set out to determine which are the parents' opinions regarding the optimum age to discover the configuration of the profile of intelligence of children and adolescents. Thus, we carried out an online survey. The online questionnaire was filled in by 507 parents. The study revealed that parents are interested to discover the dominant intelligences of their children, in order to choose appropriate extracurricular activities and to identify a suitable career for them. The results obtained indicate a strong desire of parents to understand children's strengths using a digital application based on the content of the Theory of Multiple Intelligences, developed by Howard Gardner. The results of the study are useful for school principals, teachers, and researchers in the educational sciences.

Zusammenfasung	
Schlüsselworte: Multiple Intelligenzen, Assessment, Digitale Anwendung, Partnerschaft Schule-Familie, Intelligenzprofil, Berufsberatung	Neuere Studien haben gezeigt, dass die auf der Theorie der multiplen Intelligenzen basierenden pädagogischen Ansätze effizient sind und häufig im Unterricht angewendet werden sollten. Durch diese Studie wollten wir herausfinden, welche Meinung die Eltern bezüglich des optimalen Alters haben, um die Konfiguration des Intelligenzprofils von Kindern und Jugendlichen zu entdecken. Daher haben wir eine Online-Umfrage durchgeführt. Der Online-Fragebogen wurde von 507 Eltern ausgefüllt. Die Studie ergab, dass Eltern daran interessiert sind, die dominanten Intelligenzen ihrer Kinder zu entdecken, um geeignete außerschulische Aktivitäten auszuwählen und einen geeigneten Beruf für sie zu identifizieren. Die erzielten Ergebnisse weisen auf den starken Wunsch der Eltern hin, die Stärken der Kinder mithilfe einer digitalen Anwendung zu verstehen, die auf den Inhalten der von Howard Gardner entwickelten Theory of Multiple Intelligences basiert. Die Ergebnisse der Studie sind für Schulleiter, Lehrer und Forscher in den Erziehungswissenschaften nützlich.

1. Introduction

This research paper aims to outline the main benefits of establishing the configuration of the multiple intelligences of the children and their positive effects on strengthening the school-family partnership. In order to facilitate the process of assessment of their intelligence profile, we consider that children should interact with a friendly interface, using a digital application that will facilitate and make more attractive the process of discovering their intelligence profile. Recent studies revealed that is important to establish the configuration of the profile of intelligence of children as earlier as possible. In this context, the research aims to establish how relevant is for the parents the creation of a digital application, entitled Supersona, that could establish precisely the characteristics of the profile of intelligence of each child and adolescent. In contrast to most of the instruments that are available online, that are filled either by children or adolescents, either by their parents, the instrument that we are developing in order to be administrated through a digital application, is very complex and simulates daily life contexts.

2. Theoretical foundation

The assessment of the multiple intelligences is beneficial and can improve cooperation between the school and the family (Kaur & Chhikara, 2008). "Each

kind of intelligence influences the unique traits of the learner and the future of the mature person. People usually choose a profession that expresses their strength and personal talent" (Yavich & Rotnitsky, 2020, p. 109).

The level of development of the multiple intelligences of pupils is influenced by a lot of factors, including the socio-economic status of the family, and the level of involvement of the parents in children's education (Marin & Bocos, 2019).

"A person can be most successful in a profession when the profession is according to his or her abilities and interests" (Kaur & Chhikara, 2008, p. 8). Thus, the profile of intelligence of the children could be a useful instrument for offering proper career counseling (Shearer & Luzzo, 2009; Bordei, 2015). "Need is to educate parents and teachers about the multiple intelligence of adolescents. As adolescence is the age when people start utilizing their talent and interest in particular field and start aspiring it as a career/profession" (Kaur & Chhikara, 2008, p. 9).

The level of development of each type of intelligence could be determined with various instruments, and some researchers became more preoccupied to find out how we can use technology to discover the configuration of the profile of intelligence of children and adolescents (Bordei, 2017; Garmen et al., 2019; Shearer, 2007; Tirri et al., 2013). Howard Gardner, the author of the Theory of Multiple Intelligences, and other experts in this field, such as C. Branton Shearer have outlined the positive implications of using the Theory of Multiple Intelligences in the classroom (Gardner & Hatch, 1989; Shearer, 2018; Shearer & Reith, 2011). The applications of the theory have also positive effects in enhancing peoples' self-esteem and motivation for learning (Green at al., 2015; Lei et al., 2021; Yavich & Rotnitsky, 2020). "A person learns best when taught in the way he or she can best perceive the things to be learned. The educational institutions must give attention towards recognizing the dominant intelligence of students before planning the educational activities" (Kaur & Chhikara, 2008, pp 7-8). Pupils should understand their weaknesses and strengths in order to improve their learning processes (Sener & Cokcaliskan, 2018; Yavich & Rotnitsky, 2020). The configuration of the profile of intelligence of each child or adolescent reveals important information about the pupils, that could be used to enhance teaching and learning processes according to

their needs and learning styles (Kaur & Chhikara, 2008; Snyder, 2000; Yavich & Rotnitsky, 2020).

Recent studies have revealed that didactic activities based on the Theory of Multiple Intelligences can contribute to the improvement of the school results of all pupils, including those with special educational needs (Al-Zoubi & Al-Adawi, 2019; Taspinar & Kaya, 2016; Shearer, 2004; Stanford, 2003; Yurt & Polat, 2015). The educational applications of the theory are used with success not only at the pre-university level but also in higher education (Barrington, 2004; Christodoulou, 2009; Lei et al., 2021).

3. Research hypothesis

We have started our research study to test the validity of the following hypothesis:

From parents' perspective, it is useful to know as early as possible the configuration of the profile of intelligence of the children through Supersona digital application.

4. Research questions and design

We have used a nonexperimental design in order the establish the answer to the following questions:

- How useful is from the parents' perspective the process of establishing the configuration of the profile of intelligence of the children, using a digital app?

- How difficult is for parents to understand the content of the Theory of Multiple Intelligences?

- How many of the respondents are familiarized with the Theory of Multiple Intelligences?

- Which should be the main characteristics of the Supersona digital application, in parents' opinion?

- Which is the appropriate age to establish the configuration of the profile of the intelligences of the children?

- Which is the most appropriate moment to offer guidance to pupils concerning the selection of the most suitable profession or the most appropriate university specialization?

5. Description of the instruments and method used

The research method used for data collection is the online survey. The online questionnaire was filled in by 507 parents, parents of children aged between 1 to 18 years (see Appendix A). The questionnaire was created using Typeform.

Most of the respondents have children enrolled in the primary educational system (see Table 1). Also,

most of their children are enrolled in a public/state institution (84.2 % of them), from Romania. The majority of the respondents (77.5% of them), mentioned that the decisions regarding their children's education are taken by both parents.

Table 1. The age level of the children of the respondents

The level of education at which children or adolescents are enrolled	Percentage
Does not attend kindergarten yet	0.39%
Preschool level	29.59%
Primary school level	55.03%
Secondary school level	10.85%
High school level	4.14%

6. Results

Most of the respondents (51.1%) were not familiarised with the content of the Theory of Multiple Intelligences at the moment when they filled in the questionnaire. The theory was presented through a suggestive image. Using the image, most of the respondents considered easy or very easy for them to understand the essence of the Theory of Multiple Intelligences (see Figure 1).

Figure 1. *The level of difficulty of the content of the theory, in the vision of parents*
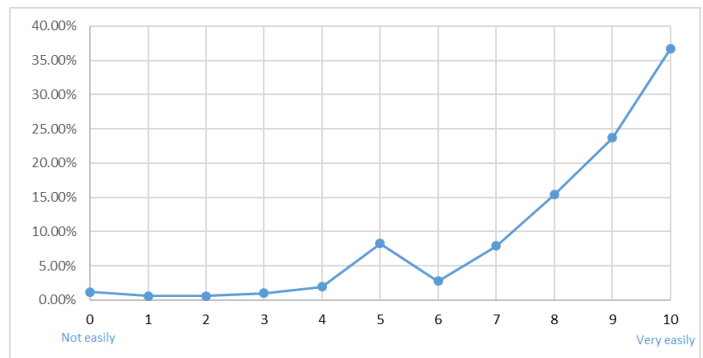
99% of the respondents considered that is important or very important for them to discover the dominant intelligences of their child in order to use that information, in cooperation with the teacher, to motivate children to learn better and more pleasurably.

In parents' opinion, it is very important to discover the dominant intelligences of the children during kindergarten age and at primary school age. The assessment of the profile of intelligence of the children should begin at kindergarten and at the beginning of primary school. Thus, in their vision, the assessment process of the multiple intelligences of the children should begin at an early age. The ages mentioned by most of the participants (69,4%) are 5 to 7 years old (see Figure 2).

Figure 2. The appropriate age for establishing the configuration of the profile of intelligences of the children
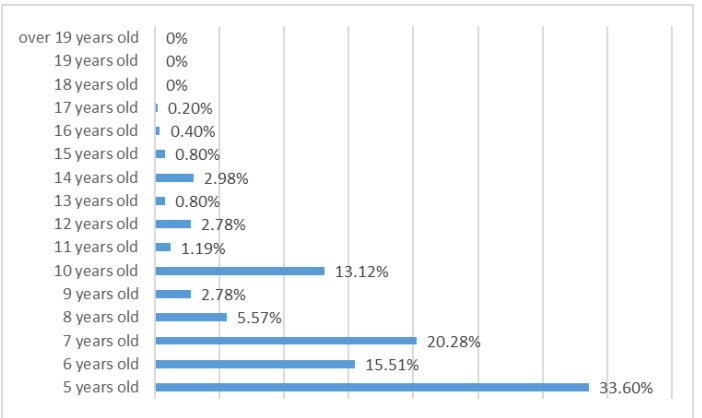
More than 98% of the respondents considered that the discovery of the dominant intelligences is useful in guiding extra-curricular activity choices. The majority of the respondents considered that is useful and very useful for them to receive help to find educators which are organizing extra-curricular activities, through which their children can develop their multiple intelligences.

At the same time, knowing the fact that the profile of dominant intelligences is an efficient instrument that could be used in order to make recommendations for higher education studies that would naturally fit to each child, most of the parents consider that is very useful for their children to receive counseling services based on the information revealed of their profile of intelligence. Most of the respondents considered that the most appropriate moment to find out which higher education studies fit their children is the period of adolescence (see Figure 2).

Figure 2. Parents' opinions regarding the appropriate age for establishing which superior studies fit to each child
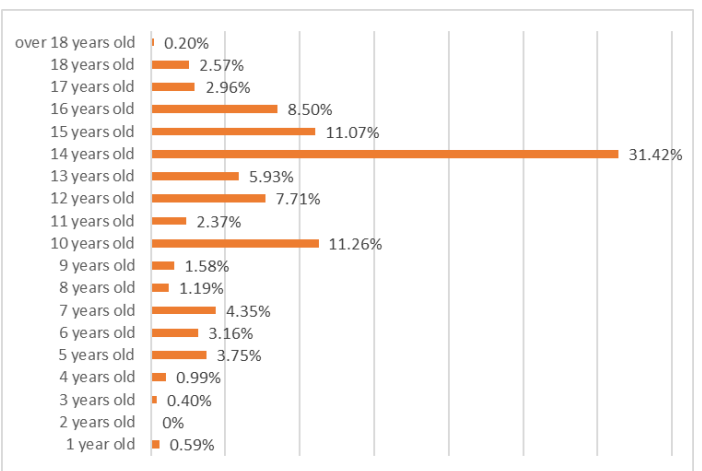
The results of the study have also revealed that 98% of the respondents consider useful or very useful to find out recommendations regarding the professions that naturally suit for each child, and which are

automatically generated by Supersona app. The ideal period to discover the professions that most naturally fit to each child is adolescence, and the optimum moment could be the final of gymnasial studies (see Figure 3).

Figure 3. Parents' opinions regarding the appropriate age for offering vocational services based on the Theory of Multiple Intelligences
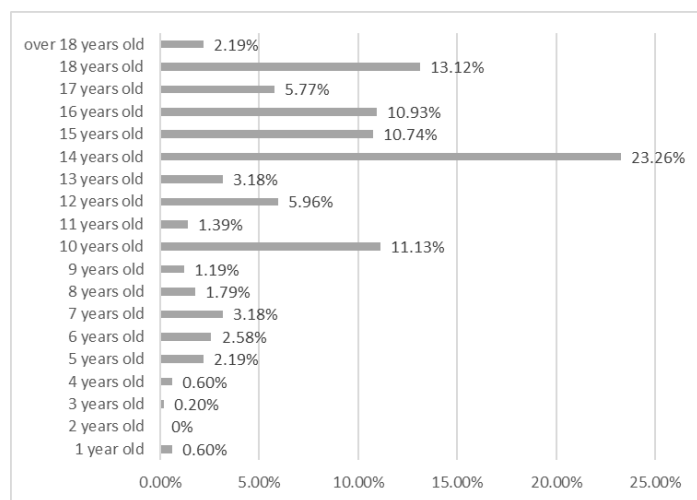
Most of the participants (93.1 % of them) were interested in using the Supersona App, which was presented as an instrument with which children can interact easily. Regarding the frequency with which they would like to assess the level of development of the multiple intelligences of their children, most of the parents (57%) mentioned that they prefer an annual or biannual assessment. Also, 66.7% would like to pay a monthly subscription and 33.3% would like to pay a one-off assessment. Almost 50% of the respondents considered that it is both the school and family's responsibility to pay for the assessment (see Figure 4).

Figure 4. The institution responsible to pay the assessment of the multiple intelligences of the children
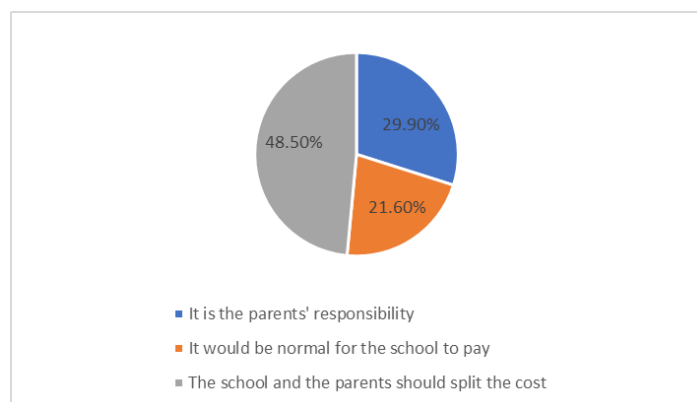
A small percentage of the participants mentioned that they have heard before about a multiple intelligences test (18,7%), but none of them could mention exactly the name of the psychological instrument.

The feedback received from parents was very positive and they were very excited to invite their children to use the Supersona App. At the same time, the respondents considered useful the process of developing the Supersona App. Some of the respondents mentioned that the advantages of using the Theory of Multiple Intelligences should be highlighted in public space and considered that substantial financial aid for developing this application should be allocated by the Ministry of Education, in order to make this assessment possible for every child. Also, during the process of development of the application should be taken into account all the educational realities, so experts in the educational field should be part of the team.

7. Results

The study has revealed that most of the parents consider very useful the process of assessment of the level of development of the multiple intelligences of their children using a digital application. The results obtained are valuable and indicate a strong desire of parents to understand their children's strengths. The information regarding the configuration of the profile of intelligence of the children and adolescents is also useful for teachers to personalize the learning process, to offer vocational counseling and to cooperate with parents in order to develop pupils' competencies. The quality of the school-family partnership is influenced by the quality of communication between parents and teachers (Marin & Bocos, 2019).

The results obtained are in concordance with the recent research studies, which have outlined that parents consider useful the process of discovering the dominant intelligences of their children. The results of the study are relevant for educators, by highlighting the positive attitudes toward the Theory of Multiple Intelligences and the importance of establishing the configuration of the profile of intelligence of the children. Some of the limits of this research are related to the number of participants and the fact that national representativeness could not be ensured. Future research studies should involve parents and teachers, from all Romanian regions.

8. Conclusions

The study has revealed that from parents' perspective it is very useful to investigate the profile of intelligence of the children. The purpose of discovering the dominant intelligences of the children is related not only to improving the learning processes

of the children. The results obtained by taking the assessment with the Supersona App will be used in offering career guidance and personalized counseling services for pupils to make the best choices in selecting the adequate university specialization and professions. Parents have positive attitudes toward the Theory of Multiple Intelligences and considered it easy or very easy to understand. The repondents consider useful to receive help in finding educators that can help them to develop the multiple intelligences of their children. Parents consider that the application should be used at an early age, in order to use the information regarding the pupils' profile of intelligence in the process of selecting adequate extracurricular activities for children. During adolescence, the purpose of discovering the profile of intelligence is related to vocational counseling, by helping adolescents to find out some of the professions or university specializations that fit with their interests, native predispositions, and actual abilities.

Authors note:

Dragoş Grigoriu is a Romanian entrepreneur and also the CEO and Founder of Supersona project. He is determined to use his expertise and skills to manage the activity of a team of experts which will develop a digital application that could precisely measure the level of the development of the multiple intelligences of children and adolescents. He attended the Creative Leadership MBA at Berlin School of Creative Leadership and other program studies offered by the University of Oxford, the University of Cambridge, and The London School of Economics and Political Science.

Luana David is one of the members of the Supersona team, who has decided to use his competencies to conduct market studies and scientific research. She holds an MSc in Entrepreneurship from HEC Paris and a masters degree in Intellectual Property Law from University College London.

Muşata Bocoş is a University Professor and Ph.D. Coordinator at the Faculty of Psychology and Sciences of Education (Babeş-Bolyai University, Cluj-Napoca, Romania). She has obtained a Ph.D. in Educational Sciences in 1997 at Babeș-Bolyai University. Her research inter

Diana-Crina Marin is currently a teacher at "Pavel Dan" Theoretical High School of Câmpia Turzii. Her research areas are aimed at discovering innovative modalities to consolidate the school-family partnership, considering that the school and family should be real partners

Cristian Dan Opariuc is Lecturer in the Faculty of Law and Administrative Sciences, Ovidius University, Ph.D. in Psychology. His domains of expertise are psychometrics, teaching and learning, scientific research, and applied statistics.

Ciprian Baciu is Lecturer in the Department of Educational Sciences, Faculty of Psychology and Education Sciences, Babeş-Bolyai University, Ph.D. in Education Sciences. His research is in the field of ICT, more precisely focused on e-teaching and e-learning.

Appendix A.

Research on the dominant intelligences of our children, according to the Theory of Multiple Intelligences

It only takes 7 minutes to complete this questionnaire. We aim to identify optimal solutions to help young people succeed in life more efficiently and pursue, with the help of family and school, a career that suits them and could satisfy them.
The research probes the opinions of parents in regards to evaluating young people by using the Theory of Multiple Intelligences, authored by Harvard professor Howard Gardner, PhD.
The knowledge of the dominant intelligences guides adolescents and children towards the professional fields in which they have native inclinations and can excel, maintaining an optimal mental state necessary for harmonious development. At the same time, it helps decide on higher or vocational studies and a professional career.
With the hope that this will bring beneficial news for our children, we thank you for your time and support!
Research Team: prof. Muşata Bocoş, PhD, Diana-Crina Marin, PhD, Ciprian Baciu, PhD, Dan Opariuc, PhD, Luana David, Dragos Grigoriu
Babeş-Bolyai University (Faculty of Psychology and Educational Studies) and Supersona Ltd, UK
This questionnaire is fully ANONYMOUS. Please complete the questionnaire in total confidence; there is no identity data.

1. If you have more than one child, please complete one questionnaire for each child. What is your child's age?
   - ☐ 1 year old
   - ☐ 2 years old

- ☐ 3 years old
- ☐ 4 years old
- ☐ 5 years old
- ☐ 6 years old
- ☐ 7 years old
- ☐ 8 years old
- ☐ 9 years old
- ☐ 10 years old
- ☐ 11 years old
- ☐ 12 years old
- ☐ 13 years old
- ☐ 14 years old
- ☐ 15 years old
- ☐ 16 years old
- ☐ 17 years old
- ☐ 18 years old

2. What grade will your child go into in the autumn of 2022?
- ☐ Not yet in school
- ☐ Year 1 Kindergarten
- ☐ Year 2 Kindergarten
- ☐ Year 3 Kindergarten
- ☐ Preparatory Grade (Year 1)
- ☐ 1st Grade (Year 2)
- ☐ 2nd Grade (Year 3)
- ☐ 3rd Grade (Year 4)
- ☐ 4th Grade (Year 5)
- ☐ 5th Grade (Year 6)
- ☐ 6th Grade (Year 7)
- ☐ 7th Grade (Year 8)
- ☐ 8th Grade (Year 9)
- ☐ 9th Grade (Year 10)
- ☐ 10th Grade (Year 11)
- ☐ 11th Grade (Year 12)
- ☐ 12th Grade (Year 13)

3. Howard Gardner, PhD, professor at Harvard University, authored 1983 The Theory of Multiple Intelligences. He proposed eight different types of intelligence to cover a much larger palette of human intellect:

1. Linguistic Intelligence – efficient use of language and vocabulary;
2. Logical-mathematical intelligence – logic solution of a numerical or scientific problem;
3. Musical intelligence– possessing a superior sense of rhythm, music and hearing;
4. Interpersonal intelligence – perception of feelings, moods, motivations and intentions of those surrounding one;
5. Intrapersonal intelligence – ability to understand one's own needs, wants, and limits;
6. Naturalistic intelligence – affinity towards nature, its components and its evolution;
7. Bodily-kinesthetic – abilities related to one's physical activity;
8. Visual-spatial intelligence– the mental capacity to visualize and manipulate objects, coupled with excellent visual memory.
Were you already familiar with the Theory of Multiple Intelligences?
- ☐ Yes
- ☐ No

4. How easily can you understand the multiple intelligences, as explained in the previous slide and summarised in the picture?

(Source of the image: https://en.wikipedia.org/wiki/Theory_of_multiple_intelligences)

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Not easily   Very Easily

5. Absolutely all children are born with one or more dominant intelligences. Discovering them can be used by the school and parents to motivate children to study better and more pleasurably. Is it important for you to discover the dominant intelligences of your child?

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Not at all important   Very important

6. At what age would you consider ideal to discover a child's intelligence profile?

- ☐ 5 years old
- ☐ 6 years old
- ☐ 7 years old
- ☐ 8 years old
- ☐ 9 years old
- ☐ 10 years old
- ☐ 11 years old
- ☐ 12 years old
- ☐ 13 years old
- ☐ 14 years old
- ☐ 15 years old
- ☐ 16 years old
- ☐ 17 years old
- ☐ 18 years old
- ☐ 19 years old
- ☐ over 19 years old

7. Aware of their child's dominant intelligences, parents can choose extra-curricular activities that develop the child's discovered intelligences. How useful would you find the discovery of dominant intelligences in guiding your extra-curricular activity choices?

0	1	2	3	4	5	6	7	8	9	10

Not useful   Very useful

8. Extra-curricular activities are provided by educators that we sometimes struggle to find or pick. Would you find it useful to have a selection of educators capable to develop specific dominant intelligences of your child?

0	1	2	3	4	5	6	7	8	9	10

Not useful   Very useful

9. The profile of dominant intelligences allows for the recommendation of higher education that would naturally fit to your child. How useful would you find a recommendation of higher studies?

0	1	2	3	4	5	6	7	8	9	10

Not useful   Very useful

11. By knowing the dominant intelligences, our app can generate recommendations regarding the professions that naturally suit your child. How useful would you find knowing these professions?

0	1	2	3	4	5	6	7	8	9	10

Not useful   Very useful

12. At what age would you consider ideal to discover the professions most naturally suited to any child?
- ☐ 1 year old
- ☐ 2 years old
- ☐ 3 years old
- ☐ 4 years old
- ☐ 5 years old
- ☐ 6 years old
- ☐ 7 years old
- ☐ 8 years old
- ☐ 9 years old
- ☐ 10 years old
- ☐ 11 years old
- ☐ 12 years old
- ☐ 13 years old
- ☐ 14 years old
- ☐ 15 years old
- ☐ 16 years old
- ☐ 17 years old
- ☐ 18 years old
- ☐ over 18

13. The discovery of the dominant intelligences is a complex scientific process. We aim to simplify it while improving the experience and even making the results more precise. We are developing an app in the form of a game that your child can interact with

pleasantly. Would you be interested in using such an app?

- ☐ I am interested
- ☐ I am not interested

14. How frequently would you test the evolution of your child's intelligences?

- ☐ Once a month
- ☐ Once every 3 months
- ☐ Once every 6 months
- ☐ Once a year

The following three questions will cover pricing regarding discovering the dominant intelligences profile via a digital app in the form of a game.

15. What should be the price of a complete assessment to be considered a qualitative opportunity not to be missed? (EURO)

16. Which should be the lowest price without sending the wrong message regarding quality? (EURO)

17. Which should be the highest acceptable price for the usefulness and quality of the assessment? (EURO)

18. Suppose you agree to a monthly subscription (min. six months) instead of a one-off payment. In that case, the assessment app can provide you, as an extra feature, with continuous valuable information about developing the dominant intelligences of your child. Would you be interested in paying a monthly subscription to access valuable information about education, higher studies and career instead of paying a one-off fee?

- ☐ I would be interested in a monthly subscription for extra information, besides the assessment
- ☐ I would be interested in paying for the assessment, with no additional subscription to information

19. In your opinion, how much should cost a monthly subscription to your financial satisfaction while at the same time representing a correct and adequate value for the service? (EURO)

20. In your opinion, who should pay for the assessment of dominant intelligences?

- ☐ It is the parents' responsibility
- ☐ It would be normal for the school to pay
- ☐ The school and the parents should split the cost

21. Where does your child currently study?

- ☐ In a private institution
- ☐ In a public/state institution

22. What is the educational curriculum that your child will attend from autumn 2022 (British, French, National, etc.)?

- ☐ Yes
- ☐ No

23. Have you previously heard of or used any other multiple intelligences assessment?

- ☐ Yes
- ☐ No

24. Have you used this assessment method?

- ☐ Yes
- ☐ No

25. It would be helpful for us if you agree to provide any information about the test that you have heard of or used previously. Please fill in the name of the test, testing method, place of acquisition, price, level of satisfaction with results, etc. Thank you!

The following questions will be about your family income and situation. Thank you for the answers!

26. What is the approximate NET monthly income of your household? (EURO)

27. How many household members contribute to this income?

- ☐ 1 member
- ☐ 2 members
- ☐ 3 members
- ☐ 4 members
- ☐ 5 members
- ☐ more than 5 members

28. Who is in charge of your child's educational decisions?

- ☐ Mother
- ☐ Father
- ☐ Both parents
- ☐ Other

29. What best describes your marital situation?

- ☐ Married
- ☐ Not married
- ☐ Divorced or separated
- ☐ Other

30. Your child lives with ...

☐ Both parents
☐ One parent
☐ A parent and their partner
☐ Other

31. Who filled in this questionnaire?
☐ Mother
☐ Father
☐ Other

32. What is the birth year of the person who completed this questionnaire?

If you want to send us a message or leave your thoughts, please fill in below. Thank you for your answers and your time!

Thank you

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