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Psychological factors related to the development of the communication competences in the first year of life

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Abstract

The first year of life is an essential phase for all psychological areas in the child development. The key competences, vital for all development processes of the child, focus on the communication and the socio-emotional competencies, mostly because the infant is strongly dependent of adult care environment. The quality of the primary caregiving relationship can configure the cognitive, affective and social development of the child in the first year of life. This study is aiming to identify the objective and psychological factors related to the development of early communication competences of the child in the first year of life and to identify the best predictors of these competencies, in order to conceptualize the best strategies to help the parents in their parental educational tasks and to prevent any delays in infant development. The study identifies a complex system of factors influencing the infant's communication skills, the prerequisites of communication being in relation both with the individual characteristics of the child in the first year of life, mainly the temperament and resilience, and with maternal and paternal factors, such as emotional maturity, patterns of primary attachment of the parents and the mother/father reflective functioning.

Keywords: Early communication competencies, emotional competency, self-regulating processes, dyadic relationships, emotional maturity

Introduction

Early relational experiences are increasingly being studied, both as condition and predictor for the long-term development of the child. The main reason for this evolution is the concern of the specialists in the field of psychology and education to create the best instruments and programs in order to support parents and children to better confront the adversities of the first years of life and to offer the best counseling programs for preventing any delays or psychopathological developments.

Sophisticated studies in the field of neuroscience and genetic research has come to confirm psychoanalysis's assumptions formulated more than a century ago: the infant's first, primary relationships shape the neurobiological and psychological dynamic of the child, impacting the individual and also transgenerational psychological development (Strathearn, Fonagy, Amico & Montague, 2009).

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The increasing ability of the newborn to self-regulate and to contain emotions, in order to be able to establish meaningful relationships and behaviors, to understand who he really is and who the others are, is only possible inside a set of strong, constant and secure interactions with their caregivers. Given that, if and only if the primary caregiver is able to self-regulate and to make sense for his own actions, emotions and beliefs, it will be able to give the child the opportunity to do the same (Briggs-Gowan et al., 2004).

The infant's early communication, especially in the last part of the first year of life, is a key factor for long-term communication competence and also for cognitive, emotional and socio-relational development. Communication skills, emotional self-control and relational competences of the child evolve all together. The child's ability to share attention with others is the base for learning language, allowing him to experience shared meanings, based on understanding words as representations of objects and concepts (Cates et al., 2012). The complex forms of very early pre-verbal communication (eye gaze, expressing emotions through mimics and gestures, using them to gain attention) are both prerequisites for speech learning, in its responsive and expressive dimensions and for meaningful relationships. They are also set up the further cognitive, emotional and socio-relational development, being related with the individual characteristics of the child, especially the temperament and resilience and with the quality of the social environment (Bradley & Caldwell, 1984).

Factors Affecting Child's Communication Skills

The socio-economical status of the family (SES) as a composite structure including family income, educational and occupational status of the caregiver, living space has an impact on the structural and functional development of the brain (Tomalski et al, 2013), on the development of language and executive functions (Ardilla, Rosselli, Matute, & Guajardo, 2005). It impacts the child's development through very complex and precocious mechanisms: parental education, quality of parental care practices, a healthy diet, prenatal health care. The caregiver's educational status influences parenting practices, being a significant predictor of the of the child's cognitive, communication and behavioral development (Dearing, McCartney, & Taylor, 2001). Through the complex verbal stimulation offered to the child (Hoff, Laursen, & Tardif, 2002), it facilitates a high-quality learning environment.

The temperament structure/behavioral style. The expression and self-regulation of primary emotions are strong predictors for the socio-emotional and adaptive development over time (Goldsmith, Lemery, & Essex, 2004). The individual expressions of emotional reactivity and self-regulation of emotions depend on constitutional factors and also on relational factors in the process of child socialization (Rothbart, Posner, & Rosiky, 1994), and, till the end of the year, sustain the working memory through the new acquired inhibitory control over its specific tasks (Diamond et al., 1997). Sensitive maternal behaviors are associated with the child's self-regulating abilities and with solve-problem skills in young children (Stams, Juffer, & Van IJzendoorn, 2002). By offering a

high-quality social and emotional relationship, along with a constant support for the child's attention abilities, in order to help him to reduce the distress (Ruff & Rothbart, 1996), the caregiver also supports complex cognitive processes (Colombo & Saxon, 2002). Although stable over time, temperament reactions, through neural systems supporting attention, suffer a continuous process of lifelong transformation, making the person more resilient, by modifying its most reactive dimensions (Shiner&Masten, 2012). Recent studies have shown that self-regulation is modifiable and can be influenced by the care strategies (Kochanska & Aksan, 2006). But the children are also the leading actors of their own development, by influencing the behavior of caregivers through their temperament characteristics and emotional and communication style (Bell, 1979). Beeghly şi Tronick (2011) recall the dyadic mutual regulatory communication system between the infant and the caregiver within which they co-adjust their social interactions, their affective and behavioral expressions in order to affect and to support each other. The efficiency of this system depends on the capacity of the baby to self-organize his emotions and his physiological states and on the maturation of the perceptual, motor, attention and socio-emotional elements of the communication system of the baby; on the ability of the parent to contain and correctly understand the meaning of the baby's communications and on his motivation and his ability to constantly and appropriately respond to his baby, in order to facilitate his adjustment efforts (Beeghly, Fuertes, Liu, Delonis, Tronick, 2011).

Caregiver's self-esteem is essential to the early care relationship and influences the development of the child through its impact on *parental self-efficacy and competence*. If the parents are feeling competent and socially engaged, they become able to understand and to respond adequately to the infant's needs, facilitating positive developmental outcomes (Small, 1988, apud. Garrett et al., 1994).

The *caregiver early attachment style in his relationships with his own parents*. There is a recognized link between the dynamic of the parents' early attachment relationships and the nature of their relationships with their own children, based on the internal working models developed in childhood (Crittenden, 1990). The history of interactions with parental attachment figures impacts the parents' self-representation and their representations of others in terms of perceived relational safety and confidence (Bretherton, 1987). This relational story will be brought, partly and moderated by other factors, into the relation to their own children (Sroufe & Fleeson, 1988). The status and quality of current couple relationships moderate the effects of childhood attachments, with reparatory consequences in parental competence (Rutter, 1989).

Emotional maturity defines the ability to react adequately to the life contexts, with as few primary, unelaborated and not symbolized reactions as possible (Talukdar & Das, 2013), to build a sense of self and a deep sense of responsibility, self-acceptance and openness to experience. The most important risks for the child, associated with the emotional immaturity of the parent refer to: emotional unavailability and a lack of

sensitivity, an unstable and unsafe relationship, a deficiency of reflective functioning in the relationship, emotional neglect, impulsive reactions and lack of constancy.

*Quality of mother/father reflective functioning***.** Reflective functioning is the ability, present in the mother and also in the father, to make sense of her/his child's mind (needs, wishes, emotions and so on), thus allowing to the child to gain a sense of his own mind (Fonagy, Gergely, Jurist, & Target, 2002). The parent's ability to reflect on and to take into consideration the wishes and intentions of the child as really belonging to the child will endow the child with a very important tool to manage stress and difficulties (Slade, et al. 2004), the child's capacity for mentalization being a key condition for its ability to self-manage, to develop a sense of personal efficiency and establish secure attachment relationships.

Present Study

In the present study, the primary objective was to identify the relationships between the child's early communication competencies in his first year of life and the individual and relational psychological factors within the care relationship; the second objective was to identify the manner and the force with which these factors influence the child's communication skills. Based on previous studies regarding this subject, we assumed that these competencies' dynamic is influenced by a very complex set of factors within the primary care relationship, including objective factors, such as SES, and also psychological factors related to the child and his parents, and also factors defining the quality of the relationship between them.

Methods

Participants and Procedure

The sample involved in the study consists of 276 subjects, organized in dyadic and triadic family structures: 101 children aged 1 month to 13 months; 100 mothers of these children and 75 fathers, respectively 74 mother-father-infant triads, 1 father-infant dyad and 26 mother-infant dyads. Mostly mothers completed the questionnaires regarding the infant's development. Participation in the study was voluntary. The recruitment of participants was direct or through groups with specific population on social networks. All the participants were informed about the aims of the research and they gave their consent for the processing and use of the information provided. Criteria for inclusion was the age of the child between 1 and 13 months, excluding situations of neurological deficiency of the child or any conditions associated with child health problems.

Measures

Three sets of questionnaires were used to assess the infant's psychological factors and the psychological variables of the mothers and the fathers, including those defining the relationship with the child.

Parent-Child Demographics questionnaire - about the child: age at the time of evaluation, gender, weight and height at birth, full term/premature/after term birth; parents data: age at childbirth, relational and educational status, occupational status before/after childbirth, health status; about the daily interaction with the child: the option for maternity/paternity leave, breastfeeding behavior, number of hours spent with the child per day, living with the child; number of adults/children in the household, birth order, monthly income.

Communication and Symbolic Behavior Scales: Developmental Profile. Infant/Toddler Checklist (CSBS DP Infant-Toddler Checklist (Wetherby&Prizant, 2002). It measures through parent report the presence in the communication of children of preverbal indicators/communication skills with predictive function for the quality of verbal language, facilitating measures to correct or prevent problems (Wetherby & Prizant, 1993). The 24 items are grouped into 7 key language predictors: 1) Emotion and Use of Gaze, 2) Use of Communication, 3) Use of Gestures, 4) Use of Sounds, 5) Use of Words, 6) Understanding of Words, 7) Use of Objects, pursuing both the communication skills and several less-considered indicators considered as the predictors of symbolic development (gestures, facial expressions, play behaviors). It calculates 3 composite scores: Communication (α =. 85), Expressive Speach (α =. 71), Symbolic (α =. 64).

Devereux Early Childhood Assessment for Infant/Toddlers – DECA I/T (Mackrain, LeBufee & Powell, 2007). An effective tool for assessing protective factors and screening for potential risks in the early social and emotional development of children. It was used with the caregiver completing the questionnaire. The questionnaire has 33 items assessing positive behaviors specific to resilient children. Scores are calculated for two scales of protective factors: the *Initiative* scale measures the child's ability to use personal independent thinking and actions in order to fulfill their needs. The *Attachment/Relationship* scale describes the deep stable relationship between the child and the caregiver. It also includes a *Total Protective Factors Scale* indicating how powerful and efficient the child's protectors are. Internal consistency for this study: Initiative Scale (α =. 91), Attachment/ Relationship scale (α =. 90), Total Protective Factors (α =. 939).

The Infant Behavior Questionnaire - Revised (IBQ-R) (Gartstein & Rothbart, 2003) (translated and adapted by Oana Benga). Measures the temperament of the infants between 3-12 months. The measured dimensions have a good internal consistency: the Activity Level (α =. 71); Distress to Limitations (α =. 78); Fear (α =. 86); Duration of orienting (α =. 84); Smiling and Laughter (α =. 81); High Pleasure (α =. 89); Low Pleasure (α =. 84); Soothability (α =. 61); Falling Reactivity/Rate of recovery from distress (α =. 82); Cuddliness (α =. 70); Perceptual Sensitivity (α =. 74); Sadness (α =. 85); Approach (α =. 82); Vocal Reactivity (α =. 74).

The Rosenberg Self Esteem Scale (Rosenberg, 1965) contains 10 items that measure the general feelings of self-worth and self-acceptance and the overall level of self-esteem. It was introduced as a measure for self-esteem in adolescents, but enlarged to a broader

category of subjects. The scale provides a uni-dimensional measure of global self-esteem. Internal consistency is good for mothers - α =. 86 and for fathers α =. 88.

Friedman Emotional Maturity Questionnaire. It measures the level of emotional maturity of the person, consisting of 25 items measuring behaviors that translate the person's emotional maturity: the way to relate to others, the way of self-concept, the maturity of behavioral reactions. Internal consistency for this study -α =. 62 (for mothers) and α =. 80 (for fathers).

Parental Bonding Instrument (PBI) (Parker, Tupling & Brown, 1979). A tool completed by self-reporting, measuring the nature of the primary parent-child care relationship. It contains 2 scales, "Care" and "Overprotection"/"Control", providing a „retrospective" assessment, offered adults (former children), based on what they remember about their attachment relationships from the first 16 years of life. It is completed separately for the mother and father, comprising 25 items, Internal consistency is good for all scales: mothers – Care Scale (mother)-α =. 91; Overprotection Scale (mother)-α =. 91; Care Scale (father)-α =. 90; Overprotection Scale (father)-α =. 80; fathers –Care Scale (mother)-α =. 88; Overprotection Scale (mother)-α =. 84; Care Scale (father)-α =. 92; Overprotection Scale (father)-α =. 87.

The Parental Reflective Functioning Questionnaire (PRFQ) (Luyten, Mayes, Nijssens, & Fonagy, 2017). PRFQ has been developed to provide a short, multidimensional assessment tool of parental reflective functioning (PRF). This concept refers to the parent's ability to recognize the child as a self-standing person, with his own mental states and experiences. It has 18 items, with answers on a scale from 1 to 7 and it is used for parents of children between 0-5 years old. There are calculated scores for three scales, the internal consistency for all these scales being a good one for this study. Thus, mothers: PM Scale (Pre-Mentalizing)-α =. 59; CM Scale (Certainty about Mental States)-α. 73 and the IC Scale (Interest and Curiosity in Mental states) - α =. 62; fathers: PM Scale- α =. 55; CM Scale -α =. 79 and the IC Scale - α =. 81.

Results

Following the data collected, the profile of the participants in the research was outlined. *Children's profile* – almost equal proportion of girls and boys, full term birth, average weight - 3.6 kg and average height - 53 cm; average age at assessment - 6 months old, the first or the second born in the family. Most of them are breastfed. In most cases, the mother is the primary care person who spends most of her time with the child, even in cases where the father opted for paternity leave.

Table 1. Descriptive statistics for children sample.

	N	Procent
Gender		
Male	52	51%
Female	49	49%
Birth		

Full Term	88	87,12%
Premature	12	11,89%
Late term	1	0,99%
Birth Order		
First	56	55,4%
Second	39	38,6%
Third	4	4,0%
Fourth	2	2,0%
Breastfeeding		
Yes	96	95,05%
No	5	4,95%
Caregiver		
Mother	99	98%
Father	1	1%
Grandparents	1	1%

Mothers' profile: the average age at the child's birth is about 31 years old, they are healthy, married to the child's father, with higher education, professionally occupied with full program before pregnancy, opting for maternity leave, with the intention of using all the 24 months to stay home with the child. *Fathers' profile*: the average age at the child birth is about 34 years old, married to the mother of the child, higher education, professionally occupied full time, a small percentage opted for paternity leave (approx. 10%), good health and spend on average 4 hours a day with the child, after the end of the work program.

Table 2. Descriptive statistics for mothers and fathers samples.

Mothers	**N**	**Percent**	**Fathers**	**N**	**Procent**
Relational Status			**Relational Status**		
Married	89	89%	Married	93	93%
Remarried	4	4%	Remarried	2	2%
Consensual relations	6	6%	Consensul relations	6	6%
Divorced	1	1%	**Statut educațional**		
Educational Status			Elementary school	1	1%
High-school	7	7%	Secondary school	1	1%
Bachelor's degree	32	32%	High-school	20	20%
Master's degree	56	56%	Vocational school	3	3%
PhD	4	4%	Bachelor's degree	39	38%
Others	1	1%	Master's degree	31	31%
Occupational Status (prebirth)			PhD	4	4%
Full-time employee	81	81%	Others	2	1%
Part-time employee	5	5%	**Occupational Status (prebirth)**		
Entrepreneur	8	8%	Full-time employee	87	86%
Unemployed	4	4%	Part-time employee	1	1%
Housewife	2	2%	Entrepreneur	10	10%
Occupational Status (after birth)			Unemployed	2	2%
Full-time employee	9	9%	Stay-at-home	1	1%
Part-time employee	2	2%	**Occupational Status (after birth)**		
Entrepreneur	1	1%	Full-time employee	80	80%
Unemployed	4	4%	Part-time employee	2	2%
Maternity leave	84	84%	Entrepreneur	10	9%
Health Condition			Paternity leave	9	9%
Healthy	97	97%	**Health Condition**		
Chronic Conditions	2	2%	Healthy	95	95%
Recent Surgeries	1	1%	Chronic Conditions	1	1%
			Recent Surgeries	2	2%
			Others	3	2%

There were analyzed the existing correlations between the child's communication competencies and the objective and subjective, individual and relational factors defining child's care environment.

Table 3. Descriptive statistics for the variables studied

Variables	*N*	*Mean*	*Std. Deviation*
Communication - social	63	13,85	5,42
Communication - expressive	63	6,34	2,78
Communication - symbolic	63	6,46	2,76
Intitiative	95	49,6947	13,68341
Attachment/Relationships	95	51,1158	7,58479
Temperament_Activity Level	96	4,0424	,81134
Temperament_Distress to Limitations	96	3,7684	,97193
Temperament_Fear	92	3,2603	1,16741
Temperament_Duration of Orienting	92	3,8704	1,28358
Temperament_Smiling and Laughter	96	5,1738	1,20126
Temperament_High Pleasure	93	5,7091	1,22124
Temperament_Soothability	95	4,9360	,60461
Temperament_Falling Reactivity/Rate of Recovery from Distress	96	5,1699	,96176
Temperament_Cuddliness	96	6,2525	,61645
Temperament_Perceptual Sensitivity	94	4,6031	1,20626
Temperament_Sadness	96	4,0200	1,20211
Temperament_Approach	92	11,1177	55,01991
Temperament_Vocal Reactivity	96	4,4971	1,11955
Temperament_Low Pleasure	94	5,1381	1,11002
Maternal Emotional Maturity	98	19,8457	2,19874
Maternal Primary Attachment_Care with Mother	97	27,7010	8,01972
Maternal Primary Attachment_Overprotection with Mother	96	11,3438	6,99147
Maternal Primary Attachment_Care with Father	94	23,0000	8,90210
Maternal Primary Attachment_Overprotection with Father	94	11,8830	6,87501
Maternal Self-Esteem	97	33,6701	4,82770
Maternal reflective functioning - PM	96	1,5365	,51877
Maternal reflective functioning - CM	96	4,6024	,96681
Maternal reflective functioning - IC	96	6,0000	,75549
Paternal reflective functioning - PM	75	1,5956	,61156
Paternal reflective functioning - CM	75	4,2578	1,08646
Paternal reflective functioning - IC	75	5,5667	,99887
Paternal Emotional Maturity	75	20,6128	2,99710
Paternal Primary Attachment_Care with Mother	74	28,4730	6,72396
Paternal Primary Attachment_Overprotection with Mother	74	11,5811	7,13856
Paternal Primary Attachment_Care with Father	73	23,2055	8,94731
Paternal Primary Attachment_Overprotection with Father	73	10,8904	7,82191
Paternal Self-Esteem	74	34,2162	4,69996

To the extent that the previous studies emphasize the fact that one of the most important ability of the child is to stimulate complex qualitative care relationships, through very effective communications, in order to obtain satisfaction for those needs vital for its development, we are interested in the factors within his life context that could have an impact on or a connection with his communication skills

There are links between the child's communication skills and: factors related to its development in other areas of its psychological functioning, especially with the socio-relational and emotional competencies of the child and with temperament factors, before the development of skills that soak up or partially disguise its direct effect; factors defining maternal presence; factors connected to the presence of the father.

The communication and language competencies of the child correlate with constitutional skills and strategies linked, theoretically, to self-regulating processes and attention control, as follows: *Social communication skills* correlate positively to the Duration of orientation, Vocal Reactivity and Approach and negatively with Distress to limitations and Low Pleasure. *Expressive communication skills* positively correlate with

the Rate of Recovery from distress and Vocal reactivity and correlate negatively with the Sadness. *Symbolic communication skills* positively correlate with Recovery from distress, Vocal Reactivity, Fear and Approach.

Table 4. Correlations among the independent variables and children's communication skills

	Commun. - social	Commun - expressive	Commun. - symbolic
Resilience_Initiative	.376**	.465**	.537**
Temperament_Distress to Limitations	-.259*		
Temperament_ Duration of Orienting	.222*		
Temperament_ Falling Reactivity/Rate of Recovery from Distress		.317*	.287*
Temperament_Vocal Reactivity	.323*	.328**	.345**
Temperament_Low Pleasure	-.265*		
Temperament_Fear			.312*
Temperament_Sadness		-.348**	
Temperament_Approach	.338**		.382**
Maternal Emotional Maturity		.316*	
Paternal Reflective Functioning_IC		.332*	
Paternal Primary Attachment_Care with Mother			.294*

**.01 level (2-tailed).
*.05 level (2-tailed).

Regarding maternal factors, the maternal emotional maturity is in a positive relationship with the child's expressive communication skills.

In the case of the paternal factors, they positively correlate with the child's communication skills regarding the capacity of reflective functioning IC and the existence of a maternal primary attachment pattern organized around a behavior of care and relational warmth.

In order to further analyze the relationships identified between the child's communicational skills and personal, maternal and paternal variables, we used multiple linear regression to build patterns of communication skills predictors of the child.

Table 5. Predictors of children's communication comptencies-social

	B	*SE b*	*β*
Pas 1			
(Constant)	7,92	2,478	
Age C	,854	,265	,478***
Pas 2			
(Constant)	,963	3,309	
Age C	,632	,253	
Resilience_Initiative	,167	058	,408***

R^2 = ,229 pentru Pasul 1: R^2 = ,379 pentru Pasul 2: * p < .05, ** p < .01, *** p < .001

Taking into consideration the various domains of the communication competencies, a strong predictor of the social communication skills, of the capacity to offer and receive information in order to communicate and to socialize, of the capacity to decode complex social stimuli is the infant's capacity to use its personal resources to obtain satisfaction, to become an active partner in social exchanges. The more active the infant is and the more initiative it has, the more it has access to more relational experiences and more

opportunities to develop its abilities to communicate and understand the language in social contexts.

Table 6. Predictors of children's communication competencies-expressive

	b	*SE b*	*β*
Pas 1			
(Constant)	4,396	1,642	
Age C	,253	,176	,236
Pas 2			
(Constant)	-4,048	4,069	
Age C	,389	,177	
M_educ status	1,298	,578	,372*
Pas 3			
(Constant)	-6,059	4,000	
Age C	,259	,180	
M_educ status	1,088	,561	,311
Resilience_initiative	,081	,039	,331*
Pas 4			
(Constant)	-9,662	3,860	
Vârsta C	,085	,175	
M_educ status	1,142	,511	,327*
Resilience_initiative	,103	,036	,420***
F_Reflective Functioning _PM	-2,377	,848	-,413***
Pas 5			
(Constant)	-2,743	4,553	
Age C	,057	,163	
M_educ status	1,024	,477	,293*
Resilience_initiative	,123	,035	,504***
F_Reflective Functioning	- 2,084	,797	-,362*
_PM F_Reflective Functioning_IC	1,219	,494	,326*

R^2 = ,056 pentru Pasul 1: R^2 = ,178 pentru Pasul 2: R^2 = ,274 pentru Pasul 3, R^2 = ,417 pentru Pasul 4 , R^2 = ,512 pentru Pasul 5: * p < .05, ** p < .01, *** p < .001

In line with previous studies and based on the correlations presented, the infant's expressive communication capacity has as its best predictors: his capacity to take initiative and to activate situations aiming to satisfy his needs, in other words, his quality as an active agent of his own development; the education status of his mother - the higher the mother's educational level, the more she will tend to offer more complex and rich communication and learning opportunities (mothers that have a higher educational level communicate more and more qualitative and stimulating, as an expressive communication, with their newborns, making them more efficient communicators); the paternal reflective capacity, as well as the availability of the father to recognize the newborn's individuality and psychical reality and his interest and pleasure to find out more about the inside world of his infant, thus stimulating the communication between them and the newborn's desire to develop the best abilities in order to impress his father and make itself understood.

Table 7. Predictors of children's communication competencies-symbolic

	b	*SE b*	*β*
Pas 1			
(Constant)	1,98	1,45	
Age C	,557	,155	,518***
Pas 2			

(Constant)	-3,34	1,77	
Age C	,387	,135	
Resilience_initiative	,127	,031	,517***
Pas 3			
(Constant)	-5,71	1,92	
Age C	,257	,138	
Resilience_initiative	,144	,030	,583***
F_Reflective Functioning _PM	-1,72	,707	-,289*

Nota. R^2 = ,268 pentru Pasul 1: R^2 = ,511 pentru Pasul 2: R^2 = ,585 pentru Pasul 3* p < .05, ** p < .01, *** p < .001

The infant's capacity to involve with all his cognitive and independent activity resources in order to obtain a qualitative response from the environment to his vital needs continues to be an important factor for his availability to communicate - he has to communicate in order to obtain a response and, most importantly, he has to communicate about what he feels (the precursor of symbolic communication), in an efficient manner in order to make himself understood and generate a positive emotion and desire to continue the relationship from the other. The father is also present, as in the previous situations, in all this development equation, contributing to the development of symbolic communication skill through recognizing and validating the newborn's own mind, his capacity to have moods, emotions and needs, to which the adult has to pay attention.

Discussions

Although the temperament has been studied especially in connection to the socio-emotional development and to the social competence (Baer et al., 2015), it is considered to play a key role in the language acquisition, influencing the age of language occurence and the quality of vocabulary and syntax in the first 2 years of life (Lieven, 1997). Two characteristics of the temperament influence specifically the dynamic of language learning: attention control and self-regulating capacity (Canfield&Saudino, 2016). Regarding our study, because the average age of the children sample is approximately 6 months old, we can say that they have begun to organize, relating to sensitive and responsive adults, some strategies of self-control that are more elaborated and able to efficiently regroup more primitive strategies and that the newborn's capacity to orientate himself and to establish positive connections with an object and his capacity to react efficiently in the regulation of negative emotions reinforce mutually, making him more competent as a partner in relation with the adults. The repeated experiences of relating to responsive adults, as long as this kind of relationship implies inevitably social and expressive communication, strengthen the self-control capacities of the newborn. Also, the capacity to orientate and the persistence of orientation at 7 and 13 months (Morales et al., 2000) increase the capacity to understand the language in the last months of the year and the language productivity at 21 months old (Salley et al, 2013). Attention capacities of the baby allow him to focus on events with a linguistic relevance, facilitating progress in the area of language (Spinelli et al., 2018). The self-regulating capacities also influence the development of the language (Perez-Pereira et al., 2016). The results of our study are in the same line with previous studies; the stronger and more intense positive

affect at 7 and 10 months correlate with a better understanding of the language at the end of the first year of life (Morales et al., 2000) and a richer expressive communication at 14 months old (Laake&Bridgett, 2014). A greater capacity to maintain and express positive affect enhances social interactions and influences, through repeated experiences, the development of the language. On the contrary, as well as our data show, a more accentuated tendency of the infant to react with distress at new and complex stimuli, generally the temperamental negativity and a weaker control compromise the interactive capacity and the child's opportunities for interaction and communication (Todd&Dixon, 2010). There are also studies that do not identify a relationship between the negative affect and communication competences (Canfield&Saudino, 2016). One possible explanation was offered by Molfese et al. (2010), who show that any form of emotional expression (negative and positive) can have a role in the development of communication, providing opportunities for dyadic or more extended relationships, shaping the context for communication and language learning. The regulation of negative states is realized through the relational synchrony with the mother and through the capacity to communicate the internal states as efficient as possible (Feldman&Greenbaum, 1998). Because we are positioned in the preverbal period, the child will go towards the mother in his attempt to manage fear and withdrawal, being forced to find communication instruments to help him communicate what is going on inside him. A higher level of negative emotionality (sadness) will reduce the capacity and availability of the child to communicate in order to express himself and make himself understood, risking the development of some strategies of self-regulation centered mostly on withdrawal and closure in front of experience. A temperamental disposition, with tolerance rather for less complex and for familiar stimuli, lacking any new quality, correlate negatively with the social communication competences, because social relationships are situations of complex stimulation, with a high level of challenge and with multimodal action stimuli. Fear, in return, can determinate the child to mobilize the symbolic communication skills harder, supported by his care environment, in order to deal with tensions exceeding his capacity to tolerate them. Child's communication skills are, also, in a positive relation with the resilience resources of the child.

Concerning the *maternal factors*, communication skills and abilities in the language area are in a positive connection with the emotional maturity of the mother, which is congruent with the information from the previous studies: an emotional mature mother will be emotionally available for the child, focused, attentive to his needs and mostly sensitive to the quality and significance of the communicative interactions with the newborn (Tronick&Gianino, 1986). A high level of internal organization will allow her to optimally deal with internal and external stressors, thus remaining available for the child, able to manage the temporary disorganization of the infant and to offer him self-regulator experiences (Wahler&Dumas, 1989). An emotionally mature mother will also be able to offer the child a rich and stimulating care environment, will recognize his individuality

and his internal world separated from hers and will have the wish to introduce the father to the child and to facilitate an early relationship for them.

The *father* is also present in this early interaction, through his capacity to function reflectively related to the child, to see in his child a partner who is interesting enough to be looked at with curiosity and the wish to find out more about the way it functions emotionally and relationally. The father's capacity to take a step back and reflect over the subjective experience of the infant is stimulating for his infant's motivation for more sophisticated ways of communication (Acredolo&Goodwyn, 1997). Infant's communication ability stimulates the father's curiosity and makes it easier to be understood by the parent, which can help it more efficiently to self-regulate itself (Fonagy et al., 2002). A curious and available father will also be able to efficiently support the dyadic mother-infant relationship, creating a three-dimensional relationship and creating the psychical space both for the infant and for the mother. The ability of the father to relate to the newborn and to positively influence its communication is even better if the father comes himself with a primary maternal attachment pattern organized around the experiences of care and recognition of the child's value as a self-standing person.

Conclusion

When the individual regulatory and the baby-parent processes are properly functioning, babies can actively engage in relationships with persons and objects and these repeated active transactions enhance better developmental results. The infants progressively assimilate more and more complex regulatory strategies, which replace the more primitive strategies based on the simple reaction to stimuli for the excitation discharge. The positive social-emotional and communication experiences allow children to develop working patterns or mental representations of the best ways to react to emotions and challenges and to use these representations on their own, thus developing a sense of personal competence in their social relationships from this point on. Increasingly, these representations will take control over all the child's functional, biological and psychological reaction systems, increasing the child's capacity to adaptively react in stressful situations, by self-regulating the emotions and behavior. It is the parents' duty to support this process through stable sustained interactional processes, through offering to the infant complex and secure experiences with people and objects, mediated by the parents' own self-regulating capacities.

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Self-esteem – the Decisive Difference between Bullying and Assertiveness in Adolescence?

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Abstract:
The extensive literature and researches on bullying illustrate the connections between self-esteem and the bullying phenomenon, asserting that both faces, bullying, and being bullied are related to some degrees with low self-esteem. Considering the bullying behavior as a form of aggressivity and being bullied as an expression of passive behavior, this study introduces the third subject of inquiry: the assertive behavior. The study investigates the impact of self-esteem on assertiveness, passive vs. aggressive conduct, and positive interactions among high school students. While these aspects were usually investigated at an early age, this study approaches them in adolescence, involving 82 adolescent students from high schools from Timisoara, with diverse specializations. The need to fit, the need for acceptance, and the fear of social rejection increase in adolescence. At this age of dramatic changes, students are susceptible to verbal, physical, or emotional bullying, with an essential impact on their self-esteem, as they are very dependent on peers' approval, perceptions and reactions. Healthy self-esteem and assertiveness might be powerful tools to fight against bullying, but there is very little focus on teaching them in traditional education. This study shows the strong correlation between self-esteem and assertiveness, and the predisposition of students with low self-esteem to passive or aggressive types of interactions.
Keywords: self-esteem; asertiveness; bullying; adolescence.

Introduction

The relations between self-esteem and efficient integrations and functionality along lifespan is a frequently investigated topic. Adolescence represents a crucial period in human life and for personality development. The adolescent is very susceptible and influenced by his image, by his mastery and his rank in peers' group. His involvement in various life contexts and efficiency in activities reflect his self-perception and self-evaluation. Assertiveness is a social competence that supports social acceptance and inclusion, efficient self-assertion, and healthy, respectful relationships. This study investigates the impact of self-esteem on peers' relations and the levels of assertiveness attained during adolescence.

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Adolescence

Adolescence is a stage of human development marked by dramatic changes and challenges, a stage of intense self-reflection and self-identification. Adolescence is sometimes a period of frustrations, doubts, fears, and worries, a battle between the need for stabilizing the self-concept and the pressures for compliance, a struggle between originality and conformism. Adolescents might become irritable, restless, furious, oppositionist, and defiant, even aggressive, and, at the same time, anxious, depressed, withdrawn, passive, or passive-aggressive.

While WHO places adolescence between 10 and 19 years of life, Pickhardt (2018) stretches this period of human adolescence and affirms that adolescence begins around nine years of age and last till 23 years of age, consisting of four stages and three types of changes: personal changes, changes of parental responses, changes in adolescent-parent relations.

Stage one, marking the separation from childhood (ages 9 t0 13), is characterized by increased distractibility, disorganizations, negativity, and oppositionist attitudes towards authority figures. It might appear overt or cover resistance, moments of enhanced curiosity and experimentation, or boredom. At this stage, Pickhardt (2018) affirms that self-esteem could drop, due to the feelings of not being treated and appropriately respected, as a "no child anymore."

Stage two (ages 13 to 15) focused on forming a new sort of family, the family of friends. Fighting for more freedom and independence and conforming more to peers pressure (including social cruelty at school) are key features of this stage.

Between 15 and 18 years of age, adolescents become to behave more like a grown-up, adopting and involving in adult's activities (parties, substance use, sexual experimentation, romantic preoccupations), but, also, adult-like sadness or worries and anxieties.

Pickhardt (2018) considers that adolescence lasts until the end of the college years, around 23 years of age. In this final stage, the adolescent faces the inevitability of becoming independent and responsible for himself and his decisions. The second drop in self-esteem could manifest in this stage due to difficulties of coping with the demands and tasks of an uncertain future, insufficient self-confidence, or self-discipline.

It is important to stress that, during adolescence, there is a shift in the relevant sources of influence, from adults (parents, teachers) to peers. The peers' opinion becomes more important than parents, the need for approval and appreciation, for fitting and being accepted and included in peers' group increases. At this stage, peers' acceptance, opinions, and reactions towards us have great importance and impact powerfully on our self-esteem.

In conclusion, developing throughout childhood, self-esteem becomes more vulnerable in adolescence. The changing relations of adolescents with relevant adults and peers require changed, and efficient communication and negotiation strategies. Being

assertive might be one of the most helpful competence in this period (Fredriksen & Rhodes, 2004; Tarrant, MacKenzie, & Hewitt, 2006).

Self-esteem

The author of the best-known self-esteem scale, Morris Rosenberg (1965), defined self-esteem as one's attitude toward himself, a "*favorable or unfavorable attitude toward the self*." Self-esteem is mainly the way we see and value ourselves.

Self-esteem seems to have a significant impact on people's well-being and their capacities to form and maintain positive and healthy relationships with others.

The self-esteem, formed alongside with all the others personal characteristics throughout the experiences we had in our childhood and adolescence, is influenced by different variables, such as genetic heritage, personality traits, life history and experiences, age, state of health, personal system of beliefs, specific social circumstances, and the other's reactions to us.

Self-esteem is not as stable as we might think, contextually, or personally. It is dependable on the events we are going through, it might fluctuate, but, eventually, every person develops a personal pattern of reactions, defining and illustrating a specific type of self-esteem. Self-esteem is a personality characteristic (trait self-esteem) with temporary, situational variations (state self-esteem). Also, self-esteem is measurable and malleable, and it can be improved.

There are some psychological concepts seemingly synonymous with self-esteem, but they are not, like self-image (McLeod, 2008), self-confidence (Burton, 2015), self-worth (Hibbert, 2013), self-efficacy (Neil, 2005), self-compassion or even self-concept (Neff, 2008, 2003).

Self-esteem has three levels: low, high, and inflated.

Using the stability criterion, Hornstein identifies five types of self-esteem: high and stable self-esteem, high and unstable self-esteem, stable and low self-esteem, unstable and low self-esteem**,** and inflated self-esteem**.**

Ross (2013) proposed another classification of self-esteem: collapsed or low self-esteem, vulnerable or regular self-esteem, and strong or high self-esteem.

People with inflated self-esteem tend to have an unrealistic, apparently undoubted, and inflated opinion about their self-importance. To maintain this opinion about themselves, they have to demonstrate continuously to others and, more importantly, to themselves, that they are better than anyone else, with the cost of underestimating everybody else, with the efforts of obtaining permanent and excessive attention and admiration. Inflated self-esteem is negative and fragile self-esteem that might generate problems in many areas of life (relationships, family, community, school, job).

The high self-esteem, considered positive self-esteem, is characterized by the acceptance and valuing oneself, without arrogance and without needing to feel better than anyone else, to diminish the others. This type of self-esteem nurtures self-confidence and offers the courage to face the problems, and keep the balance even under adverse

circumstances. Nevertheless, even persons with high self-esteem have difficulty consistently maintaining a reasonable opinion about themselves, especially in competitive contexts that can trigger and exacerbate personal insecurities.

Lack of self-valorization and confidence, insecurity, and fear of failure characterize low self-esteem. People with low self-esteem tend to have problems defending their opinions or making decisions due to their lack of self-confidence. We can differentiate between unstable low self-esteem (situational and quickly changes in the ways of self-perceiving) and stable low-self-esteem (mainly marked by indecision). People with unstable low self-esteem are sensitive and easily influenced, and their self-esteem fluctuates, from euphoria to despair, depending on the situational factors. In the case of stable low self-esteem, people manifest a quasi-permanent difficulty in making decisions, to get involved, due to their fear not to rise to the expectations (Emler, 2001).

Self-esteem has an impact on children's development and adjustment, on their psychological and somatic health and well-being (Tambelli, Laghi, Odorisio, & Notari, 2012; Neff, 2011), and even on their academic achievement (Darjan, Luştrea, & Predescu, 2016; Joshi, & Srivastava, 2009; Alves-Martins, Peixoto, Gouveia-Pereira, Amaral, & Pedro, 2002; Tremblay, Inman, & Willms, 2000).

Assertiveness

Assertiveness is a superior social ability that enables the person to act appropriately and efficiently in different social contexts and stand up for himself, for his rights, without violating the rights of another person (Petz, 1992, as cited by Vagos, &Pereira, 2010). Assertiveness is a complex construct, and its defining components are the following: (assertive) cognitions, (assertively expressed) affections and feelings, and (assertive) behaviors (Vagos, & Pereira, 2009, 2008).

Assertiveness, as a competence, if not a personal characteristic, could be taught and learned (Parray, Ahirwar, & Kumar, 2018; Whitson, 2017; Long, Long, & Whitson, 2011).

The most significant obstacles to becoming assertive are insecurity, fear, shyness, the desire to fit with peers, acceptance, the lack of self-direction, the lack of knowledge, and the inability to negotiate well.

The relations between self-esteem and assertiveness are complex. A healthy level of self-esteem boosts self-confidence and is an essential base for assertiveness. At the same time, being assertive, being able to speak for ownself, expressing and defending personal opinions and feelings, and being comfortable to say no, might build on and depend on self-esteem.

Bullying

Bullying is intentional, repetitive behavior, manifested in unbalanced power relations, to cause harm (Olweus, 1999).

On the continuum passiveness – aggressiveness, being bullied represents the passive acceptance of what is done to ownself, while bullying represents the aggressive way of

obtaining what is needed (Darjan, Predescu, & Tomita, 2017). Somewhere between passiveness and aggressiveness, there are balanced ways of dealing with others, solving arguments and conflicts, and attaining objectives: the assertive behavior. There are no very clear delimitations between those three ways of reactions, but there are some evident characteristics of them and, for sure, specific consequences. While passiveness and aggressiveness seem more inherited traits, clearly related to one's temperament, there is also much learning in them: cultural values and norms, societal principles, gender role expectations, family, and parenting styles.

To clarify the roles (active or passive) of the participants and the specific actions (bullying or being bullied) in a bullying situation, the term bullying perpetration describes the act of aggression against someone (Chen & Wei, 2011; Gendron, Williams, & Guerra, 2011), while the term *peer victimization* refers to the situation of being the subject of aggressive or abusive behavior. There are different types of bullying perpetration: physical, verbal or relational (Crick & Bigbee, 1998), either direct (overt) or indirect (covert) aggression (Drennan, Brown & Mort, 2011), or, more recently, online bullying, by using electronic means (cyberbullying, cyber harassment) (Hinduja & Patchin, 2009; Valkenburg, Peter, & Schouten, 2006).

The most frequent and common characteristic of the bullies/perpetrators seem to be the experience of growing up in hostile or rejecting family environments, the negative, self-denigrating beliefs, and negative attitudes and beliefs about the others. All these factors have the potential to impact negatively their ability to communicate efficiently with the surrounding environments (Cook, Williams & Guerra, 2010). Explanatory theories of bullying perpetration invoke either the insecure attachment (Monks, Smith, & Swettenham, 2005), learned aggressiveness (Aslan, 2011; Twemlow & Fonagy, 2005; Baldry, 2003), or weak social bonds (Chan & Chui, 2013).

In terms of gender differences (Silva, Pereira, Mendonça, Nunes, & de Oliveira, 2013; Hellström, & Beckman, 2020), boys tend to engage more in physical aggressions (Rosen, & Nofziger, 2019; Ploeg, Steglich, & Veenstra, 2020; Card, Stucky, Sawalani & Little, 2008; Hay, 2007; Archer, 2004). Also, girls engage more in relational aggression (Eriksen, & Lyng, 2018; Crick & Grotpeter, 1995), while verbal aggression is used equally by girls and boys (Fares, Ramirez, Cabrera, Lozano, & Salas, 2011). Regarding the age of manifesting these behaviors, the bullying perpetrations seem to increase during childhood, then they reach a peak in early adolescence, and tend to decline in late adolescence (Pickhardt, 2018; Nansel et al., 2001).

Many researchers studied the relations between self-esteem and bullying, suggesting the existence of negative correlations between low self-esteem and peer-victimization (Fredstrom, Adams & Gilman, 2011; Boulton, Smith & Cowie, 2010; Grills & Ollendick, 2002; Hodges and Perry, 1999).

The opinions regarding the self-esteem of the bullying perpetrators are mixed. Some studies suggest that bullying perpetrators do not have low self-esteem (Pearce and Thompson, 1998]. Other studies suggest that only perpetrators who are girls have low

self-esteem (Rigby and Cox, 1996; Slee, 1995]. However, it seems that bullying perpetrators usually have lower self-esteem than kids without behavioral problems (O'Moore & Kirkham, 2001; O'Moore, 1997; O'Moore & Hillery, 1991).

Method

Research questions and objectives

This study investigates the levels of self-esteem and assertiveness of a group of high school adolescents and aims to identify the types of peer interactions they experience the most in school: bullying, victimization, or positive interactions. We assume that the level of self-esteem influences the assertive behavior, and the relations with the peers. The main objectives of this study are the following:

- To determine the level of self-esteem and assertiveness of the participants.
- Identify the most frequent types of interactions with peers in school and the possible experiences of bullying and victimization.
- To investigate the relations between self-esteem, asertiveness, and peers' interactions.

To attain these objectives, we will answer the following research questions:

RQ1. What is the level of self-esteem of adolescent students?

RQ2. What is the level of assertiveness of adolescent students?

RQ3. What type of peers' interactions is more frequent in school?

RQ4. Are there significant correlations between self-esteem and assertiveness?

RQ5. Is low self-esteem related to bullying and victimization?

RQ6. Are there gender differences in terms of self-esteem, asertiveness, or peers' interactions in school?

Participants and procedure

Data were collected by online administration of the instruments via google forms, during March and April 2020. Participation in the study was voluntary, with the protection of subjects' confidentiality.

Table 1: Descriptive summary of the participants

Category		Frequency	%	Cumulative %
Gender	masculine	24	29.3	29.3
	feminine	58	70.7	100.0
	Total	82	100.0	
Grades	9	17	20.7	20.7
	10	53	64.6	85.4
	11	5	6.1	91.5
	12	7	8.5	100.0
	Total	82	100.0	
Specialization	Naturalistic sciences	22	26.8	26.8
	Mathematics and informatics	16	19.5	46.3
	Philology	8	9.8	56.1
	Social sciences	5	6.1	62.2
	Vocational	11	13.4	75.6
	Technologic	20	24.4	100.0
	Total	82	100.0	

The study included a total of 82 adolescent students, from 9th to 12th grade, attending high schools of various specializations (naturalistic sciences, mathematics-informatic, philology, social sciences, vocational and technologic) from Timisoara (Tab. 1). There were both boys (24, 29.3%) and girls (58, 70.7%), age ranging between 15 to 19 (m = 16.23).

Instruments

We used a battery test to assess the level of self-esteem, the level of assertiveness, and the personal experiences with the peers, ranging from bullying, being bullied or having positive interactions.

We assessed self-esteem using the Rosenberg self-esteem scale (RSES). The scale contains ten items and uses a 4 points Likert answering scale (ranging from strongly disagree to strongly agree). The final score obtained by totaling the 4 point items (after revers scoring negatively worded items - 2, 5, 6, 8, 9) could range from 10 to 40. A score of 16 or less indicates low self-esteem. Conventionally, scores between 10 to 16 correspond to low self-esteem, 17 to 33 points to medium self-esteem, and 34 to 40 points - high self-esteem.

The Rathus Assertiveness Schedule (RAS) was developed in 1973 by Spencer Rathus, based on Wolpe and Lazarus's situations, items from the Allport and Guilford, and Zimmerman scales, and diaries kept by college juniors and seniors. (Rathus, 1973). The 30 items scale measures a person's level of assertiveness, which might range from *very non-assertive* (-90 to -20 points) to *probably aggressive* (+40 to +90 points). This instrument is also frequently used to assess the efficacy of different assertive behavior training (Stevens et al., 2000).

The Romanian version of Students' Self-Report Questionnaire (SSRQ) (Stevens, de Bourdeaudhuij, Van Oost, 2000, as cited by Beldean-Galea & Jurcau, 2010) was used to identify the types of interactions experienced at school. The instrument combines items from Olweus Self-Report Bullying Inventory (Olweus, 1989, as cited by Stevens, de Bourdeaudhuij & Van Oost, 2000) and Life in School Checklist (Arora 1994, as cited by Stevens et al., 2000). The scale has three subscales that measure bullying (items 3, 6, 8, 10, 11, 16, 20, and 21), victimization (items 1, 2, 4, 9, 13, 15, 17 and 22), and positive interactions (items 5, 7, 12, 14, 18 and 19).

Results

All the responses were analyzed using the SPSS program.

Regarding RQ1, we assessed the answers to the Rosenberg Self-Esteem Scale (SES). The internal consistency of the scale was .91 (Cronbach's Alpha), which indicates a good internal consistency, similar to that reported by the author (Cronbach's Alpha = .89). While the scores could range between 10 and 40, our subjects obtained a medium score

of 26.81 (std. dev. = 9.88, minimum = 12, maximum = 40, median = 27). These results indicate a rather high score of self-esteem.

Recoding into categories (10 to 16 – low self-esteem, 17 to 33 – medium self-esteem, 34 to 40 – high self-esteem), 7.3% from subjects scored for low self-esteem, 73.2% reported medium self-esteem and 19.5% high self-esteem (Tab. 2).

Table 2: Levels of self-esteem

	Frequency	%	Valid %	Cumulative %
Low self-esteem	6	7.3	7.3	7.3
Medium self-esteem	60	73.2	73.2	80.5
High self-esteem	16	19.5	19.5	100.0
Total	82	100.0	100.0	

Answering to RQ1, we may conclude that a significant majority (92.7%) of our subject has healthy self-esteem (Fig. 1).

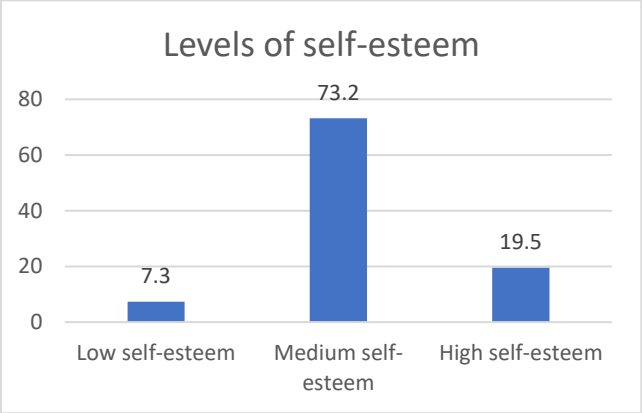

Figure 1: Levels of self-esteem

For te Rathus Assertiveness Schedule (RAS), the internal consistency was .75, similar with internal consistency reported in 1992 by Gustalfson (Cronbach's Alpha = .77). The results revealed a very low levels of assertiveness among our subject (mean = -3.70, std. dev. = 22.13, minimum = -51, maximum = +68, median = -1.50).

Grouping the raw scores into categories (-90 to -20 - very non-assertive, -20 to 0 - situationally non-assertive, 0 to +20 somewhat assertive, +20 to +40 assertive, +40 to +90 probably aggressive), 51.2% were mainly non-assertive and 37.8% were somewhat assertive. Only 8.5% were assertive, while a percent of 2.4 scored for probably aggressive (Tab.3).

The Students' Self-Report Questionnaire (SSRQ) offered information about three types of interactions with peers in school: bullying, bullying, peer victimization, and positive interactions.

Table 3: Levels of assertiveness

		Frequency	%	Valid %	Cumulative %
Valid	Very Non-Assertive	19	23.2	23.2	23.2
	Situationally Non-Assertive	23	28.0	28.0	51.2
	Somewhat Assertive	31	37.8	37.8	89.0
	Assertive	7	8.5	8.5	97.6
	Probably Aggressive	2	2.4	2.4	100.0
	Total	82	100.0	100.0	

Answering to RQ2, we could conclude that our subjects have low levels of assertiveness (Fig. 2).

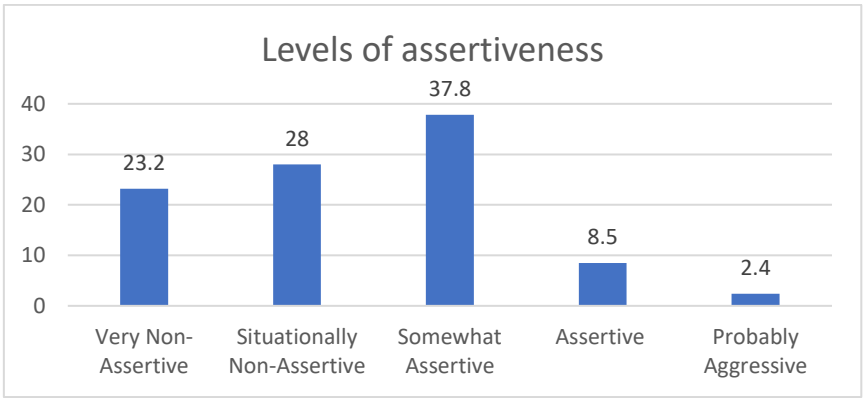

Figure 2: Levels of assertiveness

The internal consistency for *the bully subscale* was .80, consisted with previous reported Cronbach's Alpha (.82, in Stevens et al., 2000; .81, Beldean-Galea & Jurcau, 2010), for *the victim subscale* was .84 (.81, in Stevens et al., 2000; .63, Beldean-Galea & Jurcau, 2010), and for *the positive interactions* was .74 (.68, in Stevens et al., 2000; .72, Beldean-Galea & Jurcau, 2010) (Fig. 3).

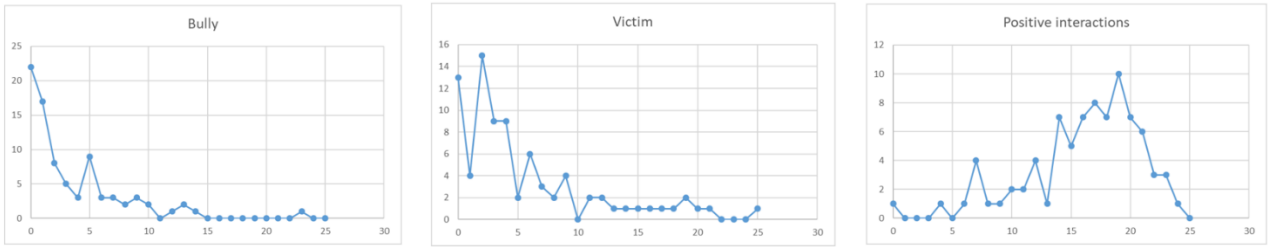

Figure 3: The Cronbach's Alpha for the subscales of the SSRQ

The more frequent type of interactions reported were the positive ones (mean = 16.10), followed by the experiences of being victimized (m = 5.60) and then the bullying perpetrations (m= 3.44) (Tab. 4).

Table 4: Descriptive statistics for the subscales of SSRQ

	N	Minimum	Maximum	Mean	Std. Deviation
Bully	82	.00	23.00	3.4390	4.20199
Victim	82	.00	25.00	5.5976	5.83912
Positive interactions	82	.00	24.00	16.0976	4.80640
Valid N (listwise)	82				

Answering to RQ3, we can conclude that our students experience mainly positive interactions in schools, and the bullying and the victimization experiences have lower frequencies (Fig. 4).

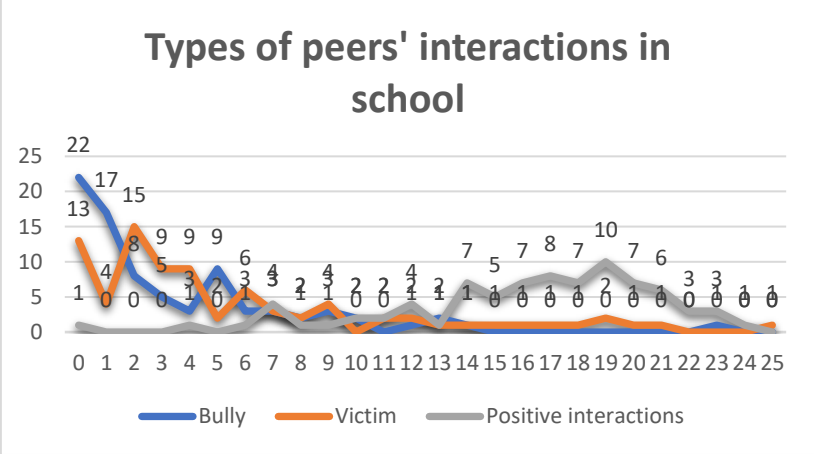

Figure 4: Frequency distributions of the subscales of SSRQ

More importantly, the differences between these types of interactions are statistically significant (Tab. 5).

Table 5: Differences between subscale's means

	t	df	Sig. (2-tailed)	Mean Difference
Bully	7.411	81	.000	3.43902
Victim	8.681	81	.000	5.59756
Positive interactions	30.328	81	.000	16.09756

We found a strong positive correlation (RQ4) between self-esteem and assertiveness (r=.70, at sig.=.000) (Tab.6).

Regarding the RQ5, self-esteem correlates positively with the positive interaction subscale (r=.24, at sig.=.030), and negatively with the victim subscale (r=-27, at sig.=.016).

We also found positive correlations between the bully subscale and the victim subscale (r=.55, at sig.=.000), and the bully subscale and the positive interaction subscale (r=.23, at sig.=.036).

Table 6: Correlations between self-esteem, assertiveness and peers' types of interactions

		SE	Assertiveness	Bully	Victim	Positive interactions
SE	Pearson Correlation	1	**.696****	.061	**-.266***	**.240***
	Sig. (2-tailed)		**.000**	.586	**.016**	**.030**
	N	82	82	82	82	82
Assertiveness	Pearson Correlation		1	.120	-.067	.140
	Sig. (2-tailed)			.284	.551	.211
	N		82	82	82	82
Bully	Pearson Correlation			1	**.546****	**.232***
	Sig. (2-tailed)				**.000**	**.036**
	N			82	82	82
Victim	Pearson Correlation				1	.172
	Sig. (2-tailed)					.123
	N				82	82
Positive interactions	Pearson Correlation					1
	Sig. (2-tailed)					
	N					82

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Differences depending on gender (RQ6) were found only in assertiveness (t=2.16, at sig.=.034).

Discussions

The study group scored high on self-esteem. These results might be explained by subjects' age, school grades, and, probably, their highschool institutions. The mean age of the students is 16.23, which places them in the middle of adolescence period.

Self-esteem tends to drop in early adolescence (ages 9-13) and at the end of adolescence (ages 18-23) (Pickhardt, 2010). In the middle of adolescence, if not adverse or stressful events encountered, self-esteem is relatively standard, although vulnerable.

At the same time, the majority of our students are in the middle of the high school period (70.7% in 10th and 11th grades). They faced and, most probably, succeeded at important exams (National Exams from the end of 8th grade) 2 or 3 years prior, which might have boosted their self-esteem. Also, only a small percent of our subjects (8.5%) is in 12th grade, and have to face other crucial challenges soon: the baccalaureate exams and college admission. In these circumstances, self-esteem is not yet under the pressure of fear, worries, and doubt.

The majority of our subjects studied valued specializations (62.2%), at prestigious, high-ranked highschool institutions from downtown Timisoara. This association, per se, might have a positive impact on one's self-esteem.

Studying at these famous high schools from Timisoara might also explain the distribution of reported types of interactions with peers. The frequency of conflicts in these contexts is usually lower, and the students, most of them, come from non-problematic family or community backgrounds. Also, data suggest that the prevalence of

bullying tends to decrease with age, dropping at the lowest levels around the age of 15 (WHO, 2020, 2016). Thus, our findings are consistent with previous studies.

As expected, self-esteem correlates positively with positive interactions, negatively with victimization, and has no significant correlation with bullying. Adolescents with healthy self-esteem report frequent positive interactions, while adolescents with low self-esteem are prone to experience victimization. Adolescents who involve in bullying perpetrating might have lower self-esteem than those who do not.

The positive correlation between bullying and victimization suggests the possible both instances which these adolescents experience: perpetrator and victim. Thus, bullying behaviors could be learned and perpetuated in different circumstances. The victim becomes the perpetrator (Ploeg et al., 2020; Predescu, 2012).

Bullying perpetrators also report positive interactions with peers. In many cases, bullying behaviors offer a special status: a popular, influential, or persuasive member of the groups, which guarantees good, rewarding relationships. (Rosen & Nofziger, 2019).

Of course, some of the results at RSSQ might be explained by the bias due to socially-accepted answers.

This study identified gender-based differences only in terms of levels of assertiveness. The reduced size of the sample might be partly responsible for this. The different level of assertiveness between boys (m=4.33) and girls (m=-7.01) most probably reflects interiorized and assumed gender-roles behaviors and gender-based expectations. Unfortunately, social competences, such as assertiveness, are not yet the primary focus of our educational system.

Conclusions

Romanian schools' bullying phenomenon might be ignored or misinterpreted by the students and teachers due to unrevised, outdated traditional opinions and beliefs about students, teachers-students relations, and classroom management. Although Romania has reported high rates of bullying behaviors in school (46% in 2011-2013, 57% in 2016-2017 according to Grădinaru Stănculeanu & Manole, 2016), ranking on third place in Europe in 2019 (WHO, 2020), the Anti-Bullying Law (221/2019) was adopted only in 2019.

The positive correlations between self-esteem and assertiveness, on the one hand, and self-esteem and positive interactions, on the other hand, demonstrate the importance of self-esteem in developing healthy and efficient ways of communication, self-assertion, and conflict management. Also, low self-esteem is a predisposing factor for victimization.

This study demonstrates the relations between self-esteem, assertiveness, and the ways adolescents interact. We consider that the responsible adults, parents, teachers, and counselors play a decisive role in nurturing healthy self-esteem and educating relevant, useful social skills in children and adolescents (Darjan, Predescu, & Tomita, 2017; Long, Long, & Whitson, 2017; Tomita, Predescu, & Darjan, 2017; Whitson, 2011).

Healthy self-esteem represents an essential asset in developing assertiveness and in avoiding aggressive, hurtful, or humiliating strategies of interaction, conflict resolution, or attaining personal objectives in life.

Limits and further directions

One of the main limitations of this study is the small number of subjects. Also, the study subjects are from a relatively rich urban area and some top-class higher schools. So we do not have students from low social and economic backgrounds or from struggling educational institutions. In further studies, we intend to expand the number and the diversity of subjects, to inspect a broader range of educational, familial, and socio-cultural contexts. Also, future studies will balance the male: female ratio.

Authorship statement:

The authors of this paper take public responsibility for the content and have had equal contributions in concept development, design, analysis, writing, or revision of the manuscript.

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Exploring the Perceptions of First-Year Engineering Students on Academic Dishonesty

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Abstract

As part of a larger study on academic dishonesty, this paper aims to be a simple investigation of students' opinions on some ethical issues, such as cheating in exams and plagiarism in assignments. The main goal was to explore the level of awareness of cheating and plagiarism, the frequency of these dishonest behaviours, students' attitudes toward cheating and plagiarism and differences between demographic variables and the three dimensions mentioned above. This study was conducted through a questionnaire completed by 138 first-year engineering students at a university in Romania. The study showed that cheating and plagiarism practices are sometimes common among students; at the same time, it is necessary to increase students' awareness and attitudes in order to combat such misconduct. Also, students' ethical values and actions are in dissonance. The differences in gender and residence area of students are insignificant. The paper recommends that different actors collaborate to continuously educate and discourage students from engaging in academic dishonesty.

Keywords: cheating, plagiarism, awareness, behaviours, attitudes.

Introduction

The role of the university is to provide education to students, forming them intellectually, as well as contributing to the development of students' moral competences, as responsible citizens of the knowledge-based society. Thus, the first academic year is essential for students' entry into higher education, because a large amount of learning takes place differently by its nature and by the previous level experienced by these students. Then, this first academic year is the basis on which educational and professional success will be built.

As part of a large study, this research explores the perceptions of academic dishonesty, for example cheating and plagiarism, among first-year students at the Technical University of Cluj-Napoca, Romania. The specific objectives of this study were the following: to find out if students are aware of cheating and plagiarism; to determine the frequency of behaviours practiced by students regarding cheating and plagiarism; to

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identify students' attitudes towards cheating and plagiarism; to look for significant differences between demographic variables and the three dimensions mentioned above.

University members should understand the opinions about academic dishonesty expressed by students so that they can contribute to possible interventions to promote academic honesty practices among students. Thus, the study aims to contribute to the understanding of first-year students 'views on cheating and plagiarism in the educational institution where the research was conducted and, possibly, in other Romanian universities, to increase students' awareness and appreciation for academic integrity.

Literature Review

Academic integrity includes values, principles, norms and regulations for managing appropriate behaviours in education and research. The approaches in recent years which analysed the development of academic integrity include aspects related to university policies and supporting student learning (Bretag & Mahmud, 2016), as well as the use of technology (Okada et al., 2019). Academic dishonesty is the opposite of academic integrity; it is characterized in various forms by which students show dishonesty in their university practices.

From the literature review, academic dishonesty can be grouped into three types: 1) cheating; 2) plagiarism; and 3) other incorrect academic behaviours. There is a growing interest in plagiarism as a result of the finding that it is an attack on the key values of academic integrity (e.g. Macfarlane, Zhang, & Pun, 2014). Other researchers observe how cheating incidence remained high in recent years, despite the academic efforts to address this phenomenon (e.g. McCabe et al., 2012; Teixeira & Rocha, 2010). Researchers argue that the factors that influence students 'misconduct are age, gender, academic level, form of assessment, course difficulty or cultural background (e.g. Teixeira & Rocha, 2010). However, the significance of these factors appears to be dependent on the context. Also, ethical practice is central to the integrity of the engineering profession. The studies show that engineering students are among the most likely to involve in academic dishonesty in higher education (e.g. Carpenter, D.D. et al., 2010). Engineering institutions and faculty members play a key role in facilitating academic integrity among engineering students.

In the European project called IPPHEAE (Impact of Policies for Plagiarism in Higher Education across Europe), in which the state of academic integrity in educational institutions was analysed, all universities participating considered academic dishonesty as a critical problem, but also the fact that there were many examples of innovative practices (Glendinning et al. 2013). One of the few comprehensive studies on this topic (Foltýnek & Glendinning, 2015) shows that Romania is ranked 4th in Europe by the rates of plagiarism. In Romania there are several studies that have shown high levels of acceptance of cheating and plagiarism among students (e.g. Ives et al., 2017). Recently, the Ministry of Education and Research (Order of the Ministry of National Education No. 3131/2018) decided to promote mandatory courses (both at the Master's Degree and Doctoral Degree) and optional courses (at the Bachelor's Degree) of ethics and academic

integrity in all Romanian universities, a movement that has its origins in some public scandals about academic questionable moral values.

Consequently, studying awareness, behaviours and attitudes towards cheating and plagiarism can help students become aware of the dangers and consequences of engaging in academic dishonesty. At the same time, it can support teachers, institutions and decision makers to eliminate or, at least, to reduce the growing trend of dishonest conduct. To address this issue, the study aims to highlight what first-year students know about the terms "cheating" and "plagiarism" and to investigate perceptions about behaviours and attitudes towards the two unethical acts.

Research methodology

The main purpose of the study was to explore the opinions of first-year engineering students on cheating in tests/ exams and plagiarism in assignments. Understanding students' views on cheating and plagiarism can significantly help teachers to communicate appropriate rules and procedures.

The following basic research questions guided this study:

1. What is the level of awareness about cheating and plagiarism?
2. How often have first-year students practiced cheating during examination and plagiarism in assignments?
3. What is the attitude of students towards cheating and plagiarism?
4. Are there differences regarding gender and residence area of students on cheating and plagiarism awareness, their behaviours and attitudes towards cheating and plagiarism?

To assess perceptions of cheating and plagiarism by first-year engineering students of Technical University of Cluj-Napoca, a questionnaire was used as a tool for this study. A sample of 138 students – 56 (40.6%) males and 82 (59.4%) females – participated in this study; 57 subjects were enrolled in electrical profile, 45 students in building profile and 36 students in mechanical profile; 92 (66.7%) students are from urban residence and 46 (33.3%) students from rural residence.

The questionnaire is divided into two parts: the first includes the demographic information of the students, the second comprises the main part of the questionnaire. To investigate the level of awareness and attitudes towards cheating and plagiarism a 5-point Likert scale was used from 1 ("strongly agree") to 5 ("strongly disagree"). The frequency of students' behaviours was measured on a 5-point Likert scale from "always" (1) to "never" (5). Some items (from 1 to 11) related to attitudes towards cheating and plagiarism were taken and adapted from the study of Amua-Sekyi and Mensah (2016). The results for the whole questionnaire showed that the internal consistency was $\alpha = 0.780$.

The study data were collected at the beginning of the second semester of the 2019–2020 academic year. The confidentiality of the respondents was guaranteed, and the questionnaire was completed "incognito", without identifying information.

Results

The quantitative data are presented descriptively, using statistical analyses to examine the distribution of responses where the problems arising from the data deserve to be highlighted. Thus, the results are presented as tables and accompanied by comments.

Regarding the first category of questions aiming to explore the level of cheating and plagiarism awareness, respondents were asked to select their option on a scale from "strongly agree" to "strongly disagree" on 11 statements. The two columns showing agreement and the two columns showing disagreement were grouped into broader categories such as "agree" and "disagree". Thus, the highest awareness (M = 1.36, SD = 0.615) was found on the statement "I understand the meaning of plagiarism" followed by "Plagiarism is unethical and wrong conduct" with mean value as 1.56, whereas the lowest awareness (M = 2.53, SD = 0.960) was observed with regards to "The faculty is effective in detecting students who cheat". Table 1 depicts that only 76.8% of respondents and 81.2% of respondents know the conceptual meanings of the terms "cheating", respectively "plagiarism".

Table 1. Awareness of cheating and plagiarism

No.	*Statements*	*Agree No. (%)*	*Unsure No. (%)*	*Disagree No. (%)*	*Mean*	*SD*
1	I understand the meaning of cheating.	120 (87)	12 (8.7)	6 (4.3)	1.71	0.803
2	Cheating on tests/ exams is an incorrect act.	118 (85.5)	16 (11.6)	4 (2.9)	1.73	0.776
3	Intentional violation of the rules in order to obtain incorrect benefits or better school results in exams or other forms of evaluation means cheating.	106 (76.8)	12 (8.7)	20 (14.5)	1.94	1.131
4	I understand the meaning of plagiarism.	128 (92.8)	10 (7.2)	0	**1.36**	0.615
5	Plagiarism is unethical and wrong conduct.	126 (91.3)	8 (5.8)	4 (2.9)	1.56	0.791
6	Using one's work (copying, paraphrasing, summarizing), intentionally or unintentionally, as one's own work, without mentioning the source and quoting it means plagiarism.	112 (81.2)	16 (11.6)	10 (7.2)	1.71	0.983
7	I know the consequences of cheating and plagiarism in academia.	126 (91.3)	10 (7.2)	2 (1.5)	1.63	0.682
8	The university has clear regulations regarding cheating on tests/ exams and plagiarism in assignments.	120 (87)	18 (13)	0	1.65	0.700
9	The faculty is effective in detecting students who cheat.	70 (50.7)	48 (34.8)	20 (14.5)	**2.53**	0.960
10	The faculty is effective in detecting students who plagiarize.	70 (50.7)	54 (39.2)	14 (10.1)	2.42	0.942
11	University is effective in punishing students who cheat and plagiarize.	88 (63.8)	36 (26.1)	14 (10.1)	2.34	0.917

Mean of means = 1.87

Asked if the university has clear regulations regarding cheating and plagiarism, more than half of students (87%) responded that they were aware of university's policies regarding cheating and plagiarism. Asked if the faculty was effective at catching students who cheat, a total of 50.7% of respondents answered agree; they gave a similar answer in case of catching students who plagiarize. These answers show that almost half of the students do not know or are not aware of their faculty effectiveness in identifying cases of cheating and plagiarism.

Table 2 indicate the frequency of cheating and plagiarism behaviours of students. Asked how often colleagues have used cheating and plagiarism in the last six months,

first-year students responded saying that sometimes their colleagues used the crib notes, handwriting, sheets with written resolutions etc. during a test or exam (52.2%) or whispered and signalled answers to someone (46.4%). The highest mean (M = 2.82, SD = 1.066) was found on the statement "Copying the answers from a colleague's work during a test or exam", whereas the lowest mean (M = 4.85, SD = 0.460) was observed with regards to "Taking tests or exams instead of another person". A frequency count on the unauthorized using of electronic devices during a test or exam found that it appears to be a common practice sometimes (33.3%) and often (14.5%) among students. Most students said they had never reported their colleagues for cheating (76.8%) and for plagiarism (75.4%).

Table 2. Cheating and plagiarism behaviours

No	*Behaviours*	*Always No. (%)*	*Often No. (%)*	*Sometimes No. (%)*	*Rarely No. (%)*	*Never No. (%)*	*Mean*	*SD*
1	Using unauthorized material (crib notes, handwriting, sheets with written resolutions etc.) during a test or exam.	4 (2.9)	16 (11.6)	72 (52.2)	34 (24.6)	12 (8.7)	3.24	0.878
2	Copying the answers from a colleague's work during a test or exam.	14 (10.1)	44 (31.9)	38 (27.6)	36 (26.1)	6 (4.3)	**2.82**	1.066
3	Unauthorized using of electronic devices (mobile phone, computer, headset, smartwatch etc.) during a test or exam.	12 (8.7)	20 (14.5)	46 (33.3)	44 (31.9)	16 (11.6)	3.23	1.109
4	Whispering and signalling answers to other colleagues during a test or exam.	6 (4.3)	24 (17.4)	64 (46.4)	34 (24.7)	10 (7.2)	3.13	0.934
5	Allowing another person to copy from them during a test or exam.	10 (7.2)	20 (14.5)	36 (26.1)	54 (39.2)	18 (13)	3.36	1.106
6	Failure to follow the instructions related to the test or exam time (e.g. continuing to write after the allotted time has ended).	4 (2.9)	24 (17.4)	12 (8.7)	60 (43.5)	38 (27.5)	3.75	1.125
7	Taking tests or exams instead of another person.	0	2 (1.5)	0	14 (10.1)	122 (88.4)	**4.85**	0.460
8	Reproducing a test or exam questions and sharing them with friends.	8 (5.8)	10 (7.2)	26 (18.9)	30 (21.7)	64 (46.4)	3.95	1.213
9	Finding an excuse to temporarily leave the exam room in order to have access to outside help.	2 (1.5)	6 (4.3)	28 (20.3)	50 (36.2)	52 (37.7)	4.04	0.942
10	Reporting cheating practiced by a colleague.	0	2 (1.5)	6 (4.3)	24 (17.4)	106 (76.8)	4.69	0.623
11	Presenting a work as its own that has been copied, in whole or in part, from the Internet or from another source without using proper citation.	2 (1.5)	14 (10.1)	26 (18.9)	38 (27.5)	58 (42)	3.98	1.073
12	Writing a work for friends which uses as its own work.	0	10 (7.2)	40 (29)	32 (23.2)	56 (40.6)	3.97	0.995
13	Presenting a work as its own that has been written/ completed, in whole or in part, by others (colleagues, companies/ specialized sites etc.).	2 (1.5)	14 (10.1)	22 (15.9)	38 (27.5)	62 (45)	4.04	1.073
14	Reporting plagiarism practiced by a colleague.	0	0	10 (7.2)	24 (17.4)	104 (75.4)	4.68	0.603

Mean of means = 3.84

Table 3 presents the third category of questions aimed at exploring students' attitudes towards cheating and plagiarism.

Table 3. Attitudes towards cheating and plagiarism

No.	*Statements*	*Agree No. (%)*	*Unsure No. (%)*	*Disagree No. (%)*	*Mean*	*SD*
1	I would cheat if the exam questions were too difficult.	58 (42)	28 (20.3)	52 (37.7)	2.94	1.242
2	I would cheat to obtain a higher grade.	50 (36.2)	28 (20.3)	60 (43.5)	3.10	1.222
3	I would cheat to avoid failure.	64 (46.4)	18 (13)	56 (40.6)	2.95	1.201
4	I would cheat so as not to disappoint my family.	34 (24.6)	34 (24.7)	70 (50.7)	3.27	1.265
5	I would cheat if other colleagues in my year/ group did the same thing.	24 (17.4)	38 (27.5)	76 (55.1)	3.57	1.086
6	I would cheat if the teacher did not teach well.	58 (42)	28 (20.3)	52 (37.7)	2.97	1.312
7	I would cheat if there was too much work.	26 (18.8)	44 (31.9)	68 (49.3)	3.40	1.084
8	It is wrong to cheat, even if the course content is difficult.	108 (78.3)	18 (13)	12 (8.7)	1.91	0.977
9	It is wrong to cheat, even if the teacher gives you too much work.	118 (85.5)	14 (10.2)	6 (4.3)	**1.81**	0.841
10	It is wrong to cheat, even if I am in danger of failing the exams.	96 (69.6)	30 (21.7)	12 (8.7)	2.02	1.010
11	It is wrong to cheat, regardless of the circumstances.	98 (71)	32 (23.2)	8 (5.8)	1.89	0.998
12	I would report the incidence of cheating committed by an unknown student.	2 (1.5)	30 (21.7)	106 (76.8)	4.07	0.770
13	I would report the incidence of cheating committed by a friend student.	0	32 (23.2)	106 (76.8)	**4.14**	0.769
14	I would plagiarize if I knew I would not be caught.	14 (10.2)	46 (33.3)	78 (56.5)	3.62	1.012
15	I would plagiarize if I did not have enough time to do the work.	26 (18.8)	38 (27.5)	74 (53.7)	3.46	1.061
16	I would plagiarize if I did not know how to quote, how to mention references.	16 (11.6)	32 (23.2)	90 (65.2)	3.66	0.991
17	I would plagiarize if I knew that severe sanctions would not apply.	12 (8.7)	24 (17.4)	102 (73.9)	3.84	0.930
18	I would plagiarize because it is easy to copy and insert from the Internet.	14 (10.1)	28 (20.3)	96 (69.6)	3.76	0.953
19	I would plagiarize if I knew the teacher would not care.	32 (23.2)	30 (21.7)	76 (55.1)	3.43	1.177
20	I would plagiarize to accomplish the task and get a better grade.	24 (17.4)	34 (24.6)	80 (58)	3.52	1.088
21	I would plagiarize when I could not express another person's ideas in my own words.	24 (17.4)	26 (18.8)	88 (63.8)	3.57	1.086
22	I would plagiarize if I knew a colleague was also plagiarizing.	4 (2.9)	20 (14.5)	114 (82.6)	4.13	0.869
23	I would plagiarize because it is easier than working on a topic.	8 (5.8)	18 (13)	112 (81.2)	4.04	0.861
24	It is wrong to plagiarize, even if I do not understand the subject matter or the teacher's instructions.	112 (81.2)	14 (10.1)	12 (8.7)	1.92	0.940
25	It is wrong to plagiarize, even if I do not pay importance to the idea of intellectual property.	112 (81.2)	18 (13)	8 (5.8)	1.95	0.911
26	It is wrong to plagiarize, regardless of the circumstances.	106 (76.8)	22 (16)	10 (7.2)	1.92	1.001
27	I would report the incidence of plagiarism committed by an unknown student.	8 (5.8)	34 (24.6)	96 (79.6)	3.98	0.912
28	I would report the incidence of plagiarism committed by a friend student.	6 (4.3)	32 (23.2)	100 (72.5)	4.02	0.870

Mean of means = 3.18

The majority of respondents agreed that "It is wrong to cheat even if the teacher gives you too much work" (M = 1.81, SD = 0.841); similarly, most respondents agreed that "It is wrong to cheat even if the course content is difficult" (78.3%) or "It is wrong to cheat, regardless of the circumstances" (71%). A large majority disagreed that they would

report the incidence of cheating committed by an unknown student or by a friend student (76.8%). Most of respondents (81.2%) opted that they consider it is wrong to plagiarize, even if they do not understand the subject matter or the teacher's instructions; similarly, the majority agreed that it is wrong to plagiarize, even if they do not pay importance to the idea of intellectual property. More than half of respondents agreed that it is wrong to plagiarize, regardless of the circumstances (76.8%). A large majority of students disagreed that they would report the incidence of plagiarism committed by an unknown student (79.6%). Also, 32 (23.2%) respondents agreed that they would plagiarize if they knew the teacher would not care.

Then, we hypothesize that gender and residence area of students do not influence cheating and plagiarism awareness, cheating and plagiarism behaviours and students' attitude towards cheating and plagiarism. Statistical results of two separate independent sample t-tests are shown in Table 4 and Table 5.

Table 4. Descriptive statistics for t-test according to the gender

	Gender	*N*	*Mean*	*SD*	*t*	*df*	*Sig (2-tailed)*
Cheating and plagiarism awareness	Male	56	1.928	0.471	1.193	136	.235
	Female	82	1.838	0.412			
Cheating and plagiarism behaviours	Male	56	3.969	0.601	2.154	136	.033
	Female	82	3.754	0.557			
Attitude towards cheating and plagiarism	Male	56	3.077	0.406	-2.306	136	.023
	Female	82	3.247	0.435			

The results show that there are slight differences between the means of male and female students on cheating and plagiarism awareness (M_{male} = 1.92, M_{female} = 1.83), on their cheating and plagiarism behaviours (M_{male} = 3.96, M_{female} = 3.75) and on attitudes towards cheating and plagiarism (M_{male} = 3.07, M_{female} = 3.24). The mean for the values of cheating and plagiarism behaviours for male students is significantly higher (t = 2.154, df = 136, two-tailed p = 0.033) than that of female students. In other words, male students are more likely to practice less unethical behaviours compared to female students. There are statistically significant differences in scores between male and female students [t(136) = -2.306, $p < 0.05$] on their attitudes towards cheating and plagiarism. There are no statistically significant differences in scores between male and female students on cheating and plagiarism awareness. Calculating the effect size, according to Cohen's criteria, differences between genders are small with values below 0.2. Thus, we conclude that gender has a low level of influence on behaviours and attitudes towards cheating and plagiarism. We admit the hypothesis that students' gender does not influence cheating and plagiarism awareness.

In Table 5 the results indicate the differences of means between the urban and rural residence of students on cheating and plagiarism awareness (M_{urban} = 1.91, M_{rural} = 1.79), cheating and plagiarism behaviours (M_{urban} = 3.76, M_{rural} = 3.98) and students' attitudes towards cheating and plagiarism (M_{urban} = 3.13, M_{rural} = 3.27). Additional analysis was performed to test for statistically significant differences.

Table 5. Descriptive statistics for t-test according to the residence area

	Residence area	*N*	*Mean*	*SD*	*t*	*df*	*Sig (2-tailed)*
Cheating and plagiarism awareness	Urban	92	1.917	0.420	1.608	136	.110
	Rural	46	1.790	0.465			
Cheating and plagiarism behaviours	Urban	92	3.768	0.624	-2.317	116.161	.022
	Rural	46	3.987	0.464			
Attitude towards cheating and plagiarism	Urban	92	3.131	0.412	-1.842	136	.068
	Rural	46	3.273	0.455			

According to the obtained results, there were statistically significant differences in cheating and plagiarism behaviours [t (116.161) = -2.317, p < 0.05)]. Thus, students from rural residence obtain on average significantly higher scores at cheating and plagiarism behaviours compared to students from urban residence. In other words, rural students are more likely to practice less unethical behaviours compared to urban students. There are no statistically significant differences in scores between urban and rural residence of students on cheating and plagiarism awareness and students' attitudes towards cheating and plagiarism. Calculating the effect size according to Cohen's criteria, differences between residence areas are insignificant with values below 0.2. Thus, we conclude that residence area has a very low level of influence on cheating and plagiarism behaviours. We admit the hypothesis that the students' residence area does not influence cheating and plagiarism awareness and students' attitudes towards cheating and plagiarism.

Discussions

This study aimed to investigate the level of awareness, behaviours and attitudes regarding cheating on tests/ exams and plagiarism in assignments as misconduct of academic integrity.

The research has shown that most first-year students are aware of what cheating and plagiarism mean. Moreover, the students are aware of the existing university regulations regarding academic dishonesty. However, it is necessary to make students aware that their faculty is effective to detect cheating and plagiarism, so that academic dishonesty is not tolerated. The results speak about the effectiveness of the values and ethics system of the faculties in the students' minds. Faculty management needs to design and coordinate the ethical education programs for students in order to directly influence the development of students, their attitudes and to strengthen the integrity of students. According to ethics management in organizations, in order to create a moral university, it needs to internalize a series of organizational virtues in all its practices and processes so as to stimulate the academic community members to behave ethically (Kaptein, M., 1998).

Specifically, teachers have more work to ensure that students not only know that there are university regulations on academic dishonesty, but also respect them. In order to increase academic integrity, teachers should emphasize the importance of integrity in

the learning process, such as: informing on the university policy and the relevance of academic honesty in the classroom and in the papers; debating significant integrity issues for the course, but also for the future professions of the students; reminding integrity rules before exams; learning to recognize the signs of stress at students; developing a good relationship between teachers and their students; discussing learning styles and raising self-awareness; helping to manage time efficiently; emphasizing the real usefulness of knowledge and skills; stressing the importance of deep learning rather than memorization; asking for help from students to create a climate of integrity in the classroom; carefully designing of authentic, innovative and meaningful assessments etc.). Some possibilities for optimizing the evaluation are suggested by O. S. Bersan (2019): ensuring the combination of feedback and feedforward, emphasizing assessment for learning, optimizing assessment strategies, including the maximum use of the online environment for assessment purposes. On the other hand, in order to avoid any confusion on understanding of what exactly cheating and plagiarism mean and how to avoid them, it is therefore necessary that expectations of academic integrity be communicated explicitly, directly and repeatedly. Allocating a considerable place to cheating and plagiarism in educational programs, with a focus on prevention rather than penalties, emphasizing the significance of academic integrity and developing the moral character of university members need to be part of university policy. Therefore, in order to deter cheating and plagiarism, faculty must establish a solid policy, inform students of this policy and enforce the policy with strict consequences.

Despite students' awareness about cheating and plagiarism, the findings suggest that the two unethical conduct are sometimes common among first-year students. Thus, the students' knowledge that there are regulations on academic dishonesty, does not act as a deterrent to the problem. The results show that there are remarkable differences in what students consider to be wrong and the frequency of cheating and plagiarism in which they are involved. Thus, students' ethical values and their actions are dissonant. The Internet and technology offer very generous conditions for intensifying cheating and plagiarism. Either the use of technology and the internet takes place in the examination room or outside it, or in assessments some students use mobile phones, headset, smartwatches, social networks or use hacking to access online solutions, it is obvious that digital natives are often more skilled in technology than some of their teachers. With the help of technological means and educational actions, teachers can limit the possibilities of cheating and plagiarism. Thus, by understanding as much as possible of engaging students in acts of academic dishonesty, institutions can use or develop effective means of detecting and combating cheating and plagiarism. Tools such as Turnitin or iThenticate can be used to enhance students' academic writing skills and to develop their citation skills. Moreover, the use of systems for student authentication and authorship verification, tools for automatic logging and locked browsers, complete online surveillance systems, content analysis software systems for authorship checking or biometric systems are other solutions proposed in the literature or practice to support

the detection and prevention of cheating and plagiarism using technologies in assessment activities. Although technology plays a major role in academic misconduct, older methods of cheating cannot be neglected as they are still used today. The most participants perceive copying from crib notes, mobile phones or other ways as unethical acts; however, they will not report their colleagues because it contradicts the ethics of peer loyalty. Therefore, it is necessary to consider students' perceptions of cheating and plagiarism because their views on the behaviour of their peers have a strong effect on their own behaviour. These findings must be considered in relation to the study of Rettinger and Kramer's (2009), which showed that "when students believe others have cheated, they are more likely to choose to cheat themselves".

Students' attitudes towards cheating and plagiarism appear to be neutral. Changing student behaviour can not only be the responsibility of higher education institutions, but also of students' families and even society as a whole. From the results, it seems that the students consider that plagiarism is less serious than cheating during an examination, because plagiarism does not take place directly during the examination or it is more difficult to detect it, so the source of the information remains unknown. It is thus necessary for educational institutions not only to increase awareness and understanding of cheating and plagiarism and the techniques used in them, but also to increase over time students' attitudes towards honest academic practices. This means constantly organizing courses, seminars, workshops or symposia on the meanings, reasons, types, consequences, techniques or tools for detecting and avoiding cheating and plagiarism.

This research has limitations, including the fact that all of these students were first-year students who probably haven't yet written a paper at the faculty level or have taken only a few final semester exams; it was restricted only to awareness, behaviours and attitudes towards cheating and plagiarism; research referred to examinations and other assessment processes. However, the most important implication of this study is that teachers and students should engage in extensive conversations about academic dishonesty that encompasses a wide range of behaviours and to promote academic honesty practices among students. Although cheating and plagiarism may not be eliminated, it is still possible for teachers to educate their students and build assessment tasks so that cheating, and plagiarism are greatly reduced.

Conclusions

Concerned about the frequency of cheating and plagiarism behaviours among students, this paper sampled first-year engineering students through a questionnaire that focused on awareness, practices and attitudes towards cheating and plagiarism. The results found that although almost three quarters of the students are aware that cheating and plagiarism are unethical practices, they would continue to be involved in cheating and plagiarism during examinations or assignments. Thus, students' ethical beliefs and their actions are in dissonance. The study showed that cheating and plagiarism practices are sometimes common among some students and that they express neutral attitudes

towards the two unethical acts. Thus, the findings of this study recommended that university and faculties should increase appreciation for academic integrity and allocate resources to prevent and combat cheating and plagiarism.

Any credible university should be fully committed to the ideal of renowned schooling, excellence in education and research with national and international recognition and legitimacy. Academic integrity is a precondition for achieving this ambitious ideal.

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Special Section for young researchers

Development of the Children's Abilities in School. A comparative study between the efficiency of the Robotics vs Applied Mathematics in Movement Transmission

Ana-Maria Popa•

Abstract

A qualitative and comparative analysis is performed regarding the possible consequences of the introduction in the school curriculum of 10-12 years old children, of Robotics and Applied Mathematics in Movement Transmission (AMMT) courses, respectively. The research has been done at the Gymnazial School Number 195, from Bucharest, during two scholar years (2017-2019). Each class had 36 students and the two hours Robotics / AMMT courses had a weekly frequency. Direct observation, interviews of the children and parents, together with the class and individual journals, where children noted their opinions during the two years, are analyzed and interpreted. The results show better scholar performances of the children following Robotics courses, in respect to the ones following AMMT ones and a greater attraction of the children in Robotics. Further, a quantitative evaluation regarding the improvement of mathematical performances of children is presented, given a very similar level of the two classes at the beginning of the research in respect to their average Maths scores. The analysis involved several statistical parameters, like the average scores obtained at Math tests, their variances, the evolution of the children with the lowest performances and the number of the maximum scores in each class. All of them suggest the Robotics course efficiency in increasing mathematical performances level of young children is superior to the one of the AMMT course, recommending the introduction of such courses in the school curriculum.

Keywords: math; networking; performance; robotics; students

Introduction

Continuous development of various commercial Robotic kits dramatically changed the classic model of the mechanical toys or puppets. Consequently, the study of Robotics is now extended at a large scale in schools of various degrees in the USA and all over the world (Rogers et al., 2010). Educative robotic kits have been designed by both commercial companies like LEGO and research labs in universities (Martin et al., 2000; Rogers & Portsmore, 2004; Rusk et al., 2008). Waterhouse (2005) outlined that most of the Robotic courses in schools are related to the concept of education focused on the individual child. A major characteristic of such an approach is the development of certain

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abilities, not only of some knowledge specific to a curriculum. Robotic courses may become important sources of development of both manual and abstract abilities for the children. So, they may be engineers by exploring the tools, electrical engines and sensors, but also they may tell us stories by creating some artefacts responding to the ambient (Bers, 2008). Robotics may help a better understanding of the basic concepts of Math, like the number, dimension and shape. Also, it provides a proper methodology for scientific research and the best approach to be followed in solving theoretical or real life problems. Robotic techniques may be too useful in order to understand abstract concepts (Wing, 2006). For example, while assembling parts of the Robotics kits, children begin to explore the Math concept of the ratio. They learn about electrical engines, sensors or about various mechanical parts, being able to create complex toys moving and reacting according to a certain design (Bers, 2008). Recently, Benitti (2012) reviewed the scientific literature related to the use of Robotics in schools, suggesting that Educational Robotics may be an important factor in improving Teaching process.

During two years (4th and 5th grades), two children classes from a public school in Bucharest (Gymnazial School 195) followed courses of Robotics and Applied Mathematics in Movement Transmission (AMMT). The two courses have been presented in addition to the normal curriculum, both groups consisting of 36 children. Robotics course used the Lego Mindstorm EV3 kit (http://mindstormes.lego.com/). A major goal of the above extracurricular activity was the development of the group relations and the increase of self-confidence of the small children. This could be put into practice by organizing discussions between children, brainstorming sessions to discuss the proposed solution and adopt the most appropriate one. The teachers also encouraged the originals ideas proposed by children. This paper presents quantitative and qualitative results regarding school performances evaluation for the two classes. Both the qualitative and quantitative analyses performed suggest better scholar performances of the children following Robotics courses, in respect to the ones following AMMT ones and a greater attraction of the children in Robotics.

The main objective of the research is to investigate the process by which students build their skills to solve mathematical problems and create skills to seek and find solutions based on technological situations encountered during the course. The research aims at the effects of learning mathematics based on the construction and programming of robots as a pedagogical means in guiding students during two years of school (4th grade and 5th grade). These effects are analyzed both in terms of school performance, but also in terms of personal development and relationships with others in groups, where common topics are discussed and resolved. All these effects come as a result of the development of weekly courses and robotics projects such as LEGO Mindstorm EV 3 and in the accumulation of knowledge with the processes and methods of solving mathematical problems.

Theoretical considerations

The term of Educational Robotics (ER) describes the use of Robotics as a method to learn and teach. It was introduced approximately 20 years ago. The first main direction of ER focused on teaching and learning higher technology. The second direction is related to the design of new projects, children becoming familiar to more and more difficult concepts by building the small robots. While the sophisticated robotics used in the great research laboratory is very expensive, the low cost of an ER kit makes the basic elements of such a technology affordable in an elementary school class too. Actually, a common robotic kit offers a programmable system, routinely based on graphic elements. It is enough simple to be used by the small children but also enough elaborated to allow users to design complex activities of the robots (Hendler, 2000)

A typical ER kit contains a *smart brick*, acting as the robot brain, various sensors (e.g. the ones for light, colour, distance) and various other elements to be attached to the main module. A popular ER kit is Mindstorm, designed by LEGO. At the first LEGO competition in 2009, around 14725 pieces were used (FIRST LEGO LEAGUE, 2011).

Most of the robotic kits provide a specific software, designed to guide the children in making the first steps toward computer programming by using advanced languages (e.g. JAVA, NQC, ROBOTC, LABWIEW). By increasing the programming level, Educational Robotics may be used both by the students in the elementary schools and in high schools too.

ER helps children learn Maths easier, scientific concepts and help them to develop technological abilities (Barker et al., 2012). There are various studies indicated such a kind of education provides opportunities of better understanding in fields like Physics, Biology, Geography or Maths. It is also useful in developing collaboration, making decisions and in solving various other problems.

Robotics inspires students to become interested in STEM field, meaning Science, Technology, Engineering and Mathematics. Barker et al. (2012) present some examples in which students who had difficulties in high school in mathematics then show interest in robotics courses and even success in this area. Working with robots inspires children to write extensively about their robotic projects, to do calculations or to be willing to learn mathematical concepts to help them make interesting programming and build problems. Barker et al. (2012) note the following:

In robotics courses, students are attracted to address the issues that have been presented to them or to their own design. The learning environment in which the student is engaged motivates him to acquire skills and acquire the knowledge necessary to achieve their goals. Students are attracted and involved in the challenges of building and programming to make real what they imagined (pp.6).

Educational Robotics helps children interested in the STEM domain (Science, Technology, Engineering and Math), helping them to understand the basic elements of the so-called "computerized thinking" (Wing, 2006), a process involving (Barr et al., 2011):

- *Formulating problems in a way that enables us to use a computer and other tools to help solve them;*
- *Logically organizing and analyzing data;*
- *Representing data through abstractions, such as models and simulations;*
- *Automating solutions through algorithmic thinking (a series of ordered steps);*
- *Identifying, analyzing, and implementing possible solutions with the goal of achieving the most efficient and effective combination of steps and resources;*
- *Generalizing and transferring this problem-solving process to a wide variety of problems* (pp.21).

Skills such as critical thinking and problem solving, communication, collaboration and creativity are the ones needed in the 21st century, according to the American Teachers Association (2010). Barr et al.(2011) observed that:

The long-term goal is to recommend ways that all students have the opportunity to learn these skills and to ensure that they can be transferred to different problems and used in different contexts (pp.23).

Methodology

The research adopted a complex methodology, both qualitative and quantitative ones, in order to show various aspects of the teaching/learning process and to outline possible correlations betwen them. This study follows to evaluate the improvement of the Maths performances of the children, both classes following the same teaching material for the lessons. The same Math curriculum has been used and, during the 5th grade, the Maths teacher was the same. The Maths tests used in evaluation was the same too, each test having a maximum score of 100, which has been finally divided by 10. There have been 36 children in each class and no social problems have been noted during the two years of the research. At the beginning of the classes, the children were given the Raven intelligence test. It was chosen the non-colored version of the test, consisting of 5 series (A, B,C,D,E) of 12 each items. The test is built to cover various levels of mental abilities and can be applied to all ages. Before the beginning of the classes, it was obtained the official approval from the school management in order to carry out these options, in optimal conditions. Also, it was obtained the approval from the parents to accept their children's participation in both courses and interviews. The confidentiality of the satisfaction questionnaires was ensured by handing them over anonymously. In the Gymnasia School Number 195, Bucharest, in the school year 2017-2018, there were eight 4^{th} grade classes. Among them, two were randomly selected, for participation in the two courses, subsequently obtaining the consent of teachers of both classes.

Significant courses details

Some significant details about the conduct of the two courses are:

- The children had the same textbooks and study materials in the Mathematics discipline.

- Both classes followed the same program and planning in Mathematics.
- In the 2017/2018 school year, in the 4th grade, the children did Mathematics with the primary school teacher, which was different.
- In the school year 2018/2019, in the 5th grade, the children had the same teacher in Mathematics.
- The Mathematics tests that were applied to the students, 3 per year (at the beginning of the school year, in the middle and at the end of the school year), both for the 4th and for the 5th grade were the same for both participating classes to courses.
- All 12 tests were evaluated by scores, the maximum score being 100 points. The capitalization of the score in a school evaluation grade was done by dividing it by 10.
- Each class had in the school years 2017/2018 and 2018/2019 the same number of 36 children.
- The general climate of the classes was very good: there were no significant problems in learning in any of the subjects, of relationships between colleagues, between students - teachers and there were no social problems.

The programs after which the courses took place in both years of study can be seen in the Appendix 1, 2, 3, and 4.

Results

An important aspect in the analysis of qualitative and quantitative data is that students started at approximately the same level, as school and intellectual training. This fact is also found in the correlation of the scores of the intelligence tests given to the two groups at the beginning of the courses. The averages of the results of the intelligence tests are (91 +/- 5)% for the Robotics group and (90 +/- 5)% for the group that participated in the AMMT course. The difference between the two averages is not statistically significant at the level of confidence of 0.05 according to the t-test.

The qualitative Analysis

It was focused on several factors involved in the learning process, especially on the emotions and on the actions of the children related to the two courses. The direct observation followed the personal involvement of the children in solving the asked tasks (Barker, 2012). The direct observation and the qualitative interpretation have been done for two school years. Children noted their impressions about the courses in a class journal. They noted about the received information and about the most attractive aspects of their activity. They also completed individual files containing their opinions by the end of each session. Their opinions have been analyzed continuously, but also at the end of each school year. Finally, children completed questionnaires regarding their satisfaction in respect to the two courses. There have been short interviews too regarding their final

opinions about the novelty of the information received, their pleasure and the enthusiasm achieved, the potential help in understanding the Maths notions. They have been questioned too in respect to the possible improvement of the group relations with their colleagues considering several tasks asked for such a children collaboration. Other questions were related to several aspects of the teaching activity and about the children intention to attend similar courses in future. Some parents also accepted to present their perception about the effects observed in children's behavior as a possible result of following the two facultative courses. So, the qualitative research consisted from the direct observation, from the files analysis and from the interview.

The Direct Observation

It outlined an increased enthusiasm of the children following the Robotics course when compared to the ones following the AMMT course. A possible explanation could be that the second group of children considered AMMT some sort of extension for the Maths regular hours, while the first group regarded Robotics as a complete new course. Another explanation could be the real life activities involved by the Robotics and the more theoretical characteristics of the AMMT lessons.

The behavior of the children illustrated clearly their preferences. The participants in Robotics systematically arrived earlier before the course hours in order to change impressions about the lessons. Such aspects have not been observed to the children attending the AMMT lessons. By the end of the Robotics hours, systematically, children from the first group used to remain further in the class, discussing the new information received and changing their impressions about the course. Similar discussions have been observed in the pause interval between the two course hours. Only a small number of children attending AMMT courses displayed a similar behavior, the pause interval being mostly treated as a routine one.

Absenteeism at the Robotics class hours was reduced when compared to the AMMT ones. Some of the children attending the Robotics course decided to buy LEGO MINDSTORMS EV3 kit from their own financial resources. They also asked the Robotics teacher to allow friends, brothers or sisters from other classes to be accepted at the lessons, which has not been observed in relation to the AMMT course. It shows the Robotics course has been highly appreciated among children.

The Analysis of the Class Journals

Two kinds of journals have been used, an individual one and a class one. Children have been asked to complete the individual journals by the end of each lesson, but writing in the class journal was not mandatory. The examination of the journals led to the following conclusions:

- the number of children writing in the class journal is greater for the Robotics class when compared to the AMMT class, indicating the Robotics course is more attractive;
- children attending the Robotic courses did explicit observations regarding the

design, the quality of various sensors and robots programming in order to fulfill certain tasks;

- just a few observations have been noted by the children attending the AMMT course;
- the attraction of the children to the small robots has been observed by the drawings accompanying the notes in both journals. Such drawings represented an initiative of the children, being not asked by the Robotics teacher. Very few similar drawings accompanied the notes in the AMMT journals.

A direct conclusion is that the children of both classes showed an increased interest in relation to the real life aspects of the two courses when compared to the theoretical ones.

Interviews Results

A direct conclusion resulting from the discussions was that the Robotics course is more suitable for the children with the age in the range 10 to 12 years, when compared to the more theoretical ATTM course. Yet, both groups of children appreciated obtaining supplemental information on the fields of Physics, Logic and general knowledge.

For the Robotic course, the parents' interviews led to the following conclusions:

- a high level of consideration regarding the course and the increased interest of the children, mainly indicated by their intention to follow Robotics too during the next school year;
- many parents wanted to financially support such courses;
- some parents acquired individually the LEGO MINDSTORM 3 kit, following the children demand;
- parents indicated the children used to tell at home about the new activities performed at the Robotics course more frequently when compared to other courses.

Interviews of the children attending the Robotics course indicated the following:

- efficiency of the team working and of the inter-collegial relations as a direct result of the tasks asked to be solved during the course hours;
- high appreciation of the free discussions and the permanent exchange of the ideas regarding the course tasks;
- freedom in promoting some ideas, irrespective some opinions did not finally acquire a majority support;
- appreciation of the criticism and of the confrontation of ideas during solving the course tasks;
- appreciation about the final solutions resulted as a general effort of the whole group.

The Quantitative Analysis

The input data used here have been the individual scores at Maths obtained at the beginning, middle and the end of the two school years by each of the 36 children of the two classes. The scores have been statistically processed, the following parameters being

evaluated for both classes : the arithmetic means, their errors (as an indicator of variance), the time evolution during the two school years of the children with the two lowest scores and the number of children obtaining the highest score. The means have been compared by using the Student's t-test (Barnes, 2008).

In the beginning, the arithmetic means and their errors (95% confidence interval) have been evaluated for the 12 samples (Maths scores for the IV-th class and for the V-th class, at the beginning, at the middle, and at the end of each school year). The results are displayed in Figure 1 for each of the six moments in time.

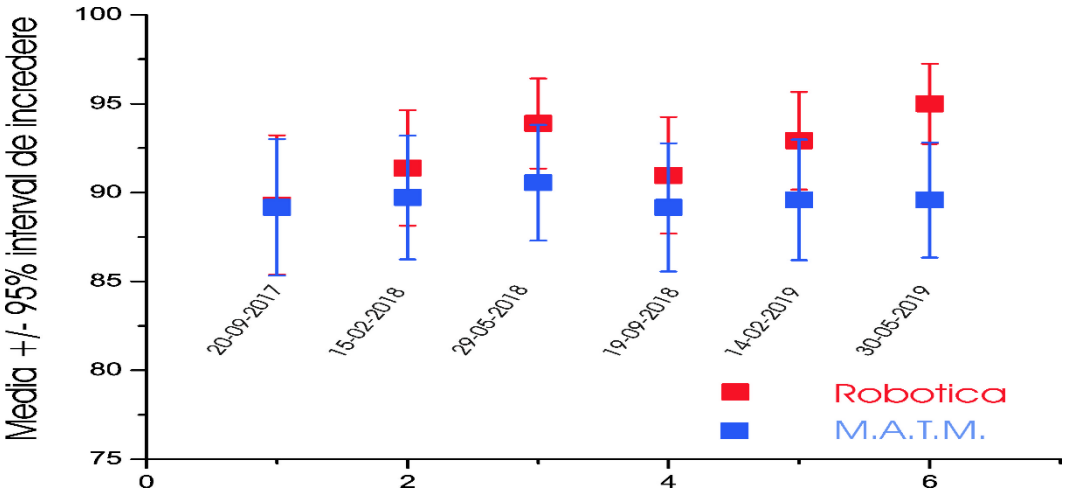

Figure 1

Chronological representation of the Maths means of the classes attending the Robotics course (red) and MATM (blue), with their bar errors (95% confidence interval)

Figure 1 shows that for the initial moment (the beginning of IVth school year, just before the start of the Robotics and AMMT courses), the Math's evaluations show a quite similar level for the two classes, the arithmetic means of the two groups of children being very close to each other. So, the initial mean of the IVth class following to attend Robotics was 89.31 (± 3.92, 95% confidence interval), while the corresponding values for the class following to attend the AMMT was 89.17 (± 3.85). Figure 1 also indicates that the difference between the two mean values increased during both school years. The mean value for the Robotics class increased too in both years, suggesting a constant development of the school performance. Such process is hard to see in the first year for the AMMT class and is definitely not observed for the second year. It is most likely the result of a lack of interest for such a course.

Despite the two classes (Robotics and AMMT) started from the same quantitative level of Math performance, the differences between their average Math's scores is finally obvious. So, the Robotics class has a mean value of 95 (± 2.25), while the AMMT has 89.58 (± 3.24). With a probability greater than 95 %, Student's t-test shows that the first mean is significantly greater than the second mean.

Both in the IV-th and V-th classes, the variance of the Math scores illustrated by

the 95% confidence interval errors decreased constantly, the values being presented in Table 1.

Table 1 Errors of the arithmetic means for the Math scores

Course /Year	IV-th Start	IV-th Middle	IV-th End	V-th Start	V-th Middle	V-th End
Robotics	3.92	3.25	2.53	3.85	3.48	3.25
AMMT	3.28	2.75	2.25	3.61	3.39	3.24

Table 1 suggests a homogenization of Math performance for both classes during each year, more obvious for the Robotic class.

For each class, the evolution of the two children having the lowest Math scores is presented in Table 2.

Table 2: Lowest Math scores during the two years

Course /Year	IV-th Start	IV-th Middle	IV-th End	V-th Start	V-th Middle	V-th End
Robotics	60 / 65	70 / 75	80 / 80	70 / 70	80 / 75	80 / 85
AMMT	65 / 65	75 / 65	75 / 70	70 / 70	75 / 65	75 / 70

Table 2 suggests that the two children having the lowest Math results from the Robotics class constantly improved their performances during both years. Their scores by the end of the Vth year are 20 points greater than the initial values. Such an evolution is less obvious for the AMMT class.

The evolution of the number of children obtaining the maximum number of points at the Maths tests is presented in Table 3.

Table 3: The number of maximum Math's scores during the two years

Course /Year	IV-th Start	IV-th Middle	IV-th End	V-th Start	V-th Middle	V-th End
Robotics	15	15	18	14	17	19
AMMT	15	13	13	14	11	11

For the Robotics class, Table 3 suggests the number of children with highest performances at Math has a small positive jump between the middle and the final time period, but constantly increases during the second year. Regarding the AMMT class, the similar number constantly decreased during both study years, a possible explanation being the lack of interest associated with a more theoretical course.

V. Limitations of the research

The main limitations of the research are the following ones:

- the relative small number of children / classes used, making questionable the generalizations of the results. This aspect is correlated to the financial costs involved by the Robotics course (the cost of the Robotic kits, of the teacher preliminary training and for the teacher's salary).
- a possible overload of the curriculum, considering that both Robotics and AMMT courses are extracurricular ones.
- the relative high financial cost of organizing a robotics course in a public scool, in both terms of purchasing robotic kits, but also in terms of financial remuneration for specialized teachers.

VI. Conclusions

The result of the Statistical Analysis suggests an increase of the Math's performances for the children following the Robotics course when compared to the ones following the AMMT one. The performance is illustrated by a constant increase of the average score of the class, by a statistical homogenization of the group of children, by better results of the children with the lowest scores and by a greater number of maximum scores obtained.

So, Educational Robotics might be a non-traditional manner to increase the children's interest in learning. Working in a group, solving the practice problems together, children develop self-confidence, creativity and increased enthusiasm. In such a way, Robotics may become a strong educational way to prepare children for a computerized thinking asked by the modern society (Duckworth, 2005).

The results of this research suggest that Robotics should be introduced as extra-curricular activity in several pilot schools in the country and can support the adequacy of the education system to the needs of children and society. Yet, these needs must be balanced. Quality education is achieved with effort from the management of schools, teachers and with the help of supporters, parents, professional associations and Non-Governmental Organizations. Additional investments are needed in order these courses can be carried out in the field of education. So, in a relatively short time, this project will gain confidence, and Robotics will be introduced as an option school course, the main benefit being to cover a wide range of children from all segments of society.

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APPENDIX 1

Robotics Year I (2017-2018)

The 3rd generation LEGO Mindstorm kit allows in an interactive / intuitive way the assimilation of the basic notions of visual programming of computers. It has an immediate effect and applicability in the movement and interaction with the environment of an assembly that fully fulfills the notion of a robot. In the last 10 years since the phenomenon spread all over the world, it has been observed in carefully monitored studies, that during the course sessions, groups of pupils / students regardless of age target develop cognitive, social and communication skills. They find solutions much faster through abstract thinking, due to the fact that the theoretical notions learned are immediately applied. The course aims to teach the target group notions of visual programming of computers, elements of motion mechanics, understanding the notion of data acquisition, application of mathematical models in describing and replicating phenomena reproduced by a machine during twenty sessions of 2h each.

1. Introductory Course. Brief history of the tools used in human history up to independent programmable machines; description of the Mindstorm kit; installation and configuration of specific software on the personal computer; first program: touch sensor reading.
2. Specific movement elements, gears; assembling the first robot. Its connection to the servomotors. Program: movement of the robot in a circle.
3. Introductory programming course. Transposing a problem into a logical scheme; identifying the code blocks needed to replicate the schema in a program.
4. Insert the color sensor. Presentation of the 3 modes of operation, assimilation of the notion of reflected light intensity. Understanding how computing machines "understand" the environment. Basic notions of data acquisition; mathematical problematic situations.
5. Assimilation of the notion of variables and their allocation in available memory locations. Elementary notions of initialization and increment / decrement with constant values + mathematical problematic situations.

6. Color detection. Development of a program through which the robot previously built as a base, recognizes the elementary colors by moving over a colored surface. Reporting them on the smart-brick display in a table + mathematical problem situations.
7. The program "follow" the line. Purpose: the continuous movement of a robot on the demarcation line between two contrasting colors. Notions: logical scheme, transposition into blocks of code, the notion of infinite loop; mathematical problematic situations.
8. The experimental way of adjusting the parameters applied on the previous mathematical model. Introducing the proximity sensor. Data acquisition of the sensor when converting the distance into numerical values + mathematical problematic situations.
9. Deepening the notions of calibration / parameterization based on experiment. The difference between the theoretical application of the mathematical model on the robotic machine and the actual operation + mathematical problematic situations.
10. Color sensor calibration program. Its usefulness in changing the operating conditions and the effect of ambient light on the "follow the line" program + mathematical problematic situations.
11. Inserting the proximity sensor into the previously assembled machine. Putting the robot in the decision-making situation to avoid random obstacles + mathematical problematic situations.
12. Case study: solving a maze by using the proximity sensor. Use of subroutines. The logical scheme of the program.
13. Effective programming of the previous model. Empirical adjustment of parameters + mathematical problematic situations.
14. The mechanics of a robot "hand" that grabs and releases objects. Presentation of the mechanisms: "worm wheel worm" and "eccentric" + mathematical problematic situations.
15. Deepening the learned mechanisms by applying them in a "Spirograph" model that draws in a repetitive way. Tracking the effect of various parameters in the mechanics of motion + mathematical problematic situations.
16. Programming the subroutine specific to the movement of the robotic arm. Empirical measurement of the rotations necessary for the micro motor to achieve the "grab" and "release" effect + mathematical problematic situations.
17. Presentation of the final theme. Replication of the "amazon warehouse" example of arranging goods in a fully robotic warehouse.
18. Presentation of the plan / route. The objective pursued is: moving from a starting point of the robot on a predetermined route, detecting the "goods" stop / grab / return on the same route, release on the starting point + mathematical problematic situations.
19. Adjusting the "primitive" subroutines previously developed: "follow the line" and "grab / lift" for simultaneous operation. The need to introduce "flag" variables to achieve the objective + problem situations.

APPENDIX 2

Robotics Year II (2018-2019)

1. Introductory course. Review of the main knowledge learned at the Robotics courses in the previous school year and bringing back into discussion the main team projects carried out.
2. Presentation and discussion of interviews with students participating in the international Robotics Olympics and competitions around the world. Observation of certain projects, ideas and designs of participating and winning robots in different years of international competitions and Olympics.
3. Using the proximity sensor in writing programs, for the robot to follow the path of a maze, being at certain distances from the walls: 10 cm, 15 cm, 20 cm. Finding solutions for the situation in which the robot wanders far forward or backward. Challenge: finding a way to improve the program so that the wall path is faster + solving possible math problems that require solving the topic.
4. Creating custom blocks in EV3 (My Block) software. The usefulness and construction of a custom block on groups with inputs and outputs. Update the EV3 application for such exercises. Challenge: moving the robot according to certain distances given in certain times.
5. Scroll through a color line in the custom block with several entries. Writing the program to trace a color line, which stops after a certain number of degrees. Changing the input when you want to follow a route over different distances. Adjusting the speed of the robot to a certain direction.
6. Using the infrared sensor. Test Infrared sensor for measuring distances. Applications on mathematical exercises and problems. Limitations of the infrared sensor.
7. Experiment with the different modes of movement of the robot. Mathematical calculations to avoid obstacles in the way of the robot.
8. Remediation techniques. Using useful strategy (debugging) in the situation in which something goes wrong in the program. Finding out the values different sensors sees.
9. Improving the reliability of the program. Finding possible solutions to increase the reliability of the program. Characteristics of the robots participating in competitions.
10. Calibration of color sensors. Using the EV3 color sensor in light sensor mode (reflected light mode) and its calibration. Writing a custom program for different color sensors (equations and mathematical situations).
11. Types of variables. Learning, reading and writing: data, sensors color, display blocks, and color blocks.
12. Proportional control. Learning to apply proportional control to different sensors. Solving math blockages and calibrating the sensor color.
13. Deepening proportional control. Exercises and mathematical situations.
14. Introduction of the sound sensor in the proportional control.

15.Bluetooth functionality. Learning about radio frequencies as well as ways communication between devices. Learning to receive and send messages between EV3 Mindstorm bricks.

16. Challenges: different exercises and problems given to students to be solved and discussed within the group.

17. Deepening challenges: different exercises and problems given to students to be resolved and discussed within the group.

18. Choosing and discussing the preparation of the final project.

19. Discussing and resolving any difficulties encountered during the course implementation of the project.

20. Presentation and discussion of projects.

APPENDIX 3

Applied Mathematics in Motion Transmission Year I (2017-2018)

1. Introductory course. Review of the mathematical knowledge.
2. Problems finding the unknown number.
3. Problems that are solved by more than three known operations.
4. Graphic representation method.
5. Method of comparison / reduction per unit.
6. Discrete quantity method.
7. Reverse method.
8. Motion problems (distance / speed / time). Problematic situations.
9. Deepening problems. Calculation of distance / speed / time.
10. Problematic speed calculation situations.
11. Probability method.
12. Problem solving by combined methods.
13. Calculation of area / volume. Problematic situations.
14. Problems with fractional / decimal / percentage numbers.
15. About simple electrical circuits, for children to understand. Experiments.
16. About simple electrical circuits (deepening).
17. Problems of calculating time intervals.
18. Problem solving by combined methods (deepening).
19. Project "Mathematical surprises around us".
20. Review and evaluation of the M.A.T.M.

APPENDIX 4

Applied Mathematics in Motion Transmission Year II (2018-2019)

1. Introductory course. Review of mathematical knowledge.
2. The power of numbers. Calculation exercises.
3. Complex power calculation problems.
4. Problems of removing integers from a fraction.
5. Estimation and approximation problems.
6. Logic problems and probabilities.
7. Combined methods for solving arithmetic problems.
8. Combined methods for solving arithmetic problems (consolidation).
9. Combined methods for solving arithmetic problems (deepening).
10. Simple motion transmission systems.
11. Simple motion transmission systems. Mathematical situations.
12. Problems of deepening the movement. Speed / distance calculation (consolidation).
13. Problems of deepening the movement. Speed / distance calculation (deepening).
14. Complex problems of calculating various time intervals (consolidation).
15. Complex problems of calculating various time intervals (deepening).
16. Problems in which the furniture has opposite meanings ("meeting problems").
17. Problems in which the furniture has the same direction of movement ("tracking problems").
18. Problems finding the area / volume in various geometric constructions.
19. Project "Mathematics is in EVERYTHING".
20. Review / evaluation of the M.A.T.M.

Educational dropout in Israel – general progress in the last decade

Usama HEIB•, Theofild-Andrei LAZĂR•

Abstract

In Israel, the awareness on the youth dropout from school problem has increased in the last decade. There is no doubt that dealing with this phenomenon poses a challenge to the Israeli society and to the authorities responsible for educational services. It turns out that certain groups among the Israeli population are at a higher risk of dropping out from school than others. As a result of it, many teenagers from these groups do not complete their high school studies and are unable to integrate in a qualitative and significant manner in the army and the labour market. Moreover, dropping out of the education system may have a significant impact on the mental and economic well-being of young generations of citizens. Therefore, preventing the problem of dropout and helping the youths to get back into the loop is a tremendous challenge to the Israeli education system. Even if in the last decade Israel registered lower rates of educational dropout then before, middle, and high-school students are still struggling with the issue. Therefore, the article underlines theoretical aspects regarding educational dropout as general framework and presents the specifics of the phenomenon in the Israelian educational system. The last part of the paper follows, based on secondary data analysis extracted from national official data, the differences between the two main state educational systems in Israel (Hebrew and Arabic) in terms of tendencies on educational dropout in the last ten school years. The data reveals that, even if there is progress in preventing educational dropout in both systems, the Arabic system registers significantly higher rates that the Hebrew educational system.

Keywords: Educational dropout, youth in risk, educational system, covert and overt dropout.

Introduction

The problem of dropping out from formal education frameworks is a global phenomenon, that not only concerns the national educational systems, but the whole societal mechanisms, having potential consequences in a variety of important areas: economic development, societal security, wellbeing and so on.

Since education is the wheel that drives individuals to mobility, activity and meaningful participation in the community and state life, the phenomenon of dropout (covert or overt) is actually one of the central variables that continuously feed the social gaps formation in contemporary societies, including Israel.

In Israel, the data shows improvement in the last decade for the general population, but certain at-risk categories continue to register significantly higher rates of dropout compared to the national mean.

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The present paper follows some theoretical aspects about the concept of educational dropout and presents a secondary data analysis of general tendencies on dropout in Israel in the last decade for pupils from middle and high-school, considering these two educational periods as high risk ones. Previous studies show that the risk of youth dropping out in Israel is mainly at the age of 15-17, which is the age at which the student moves from the middle school to the high school system (Moore, 2008).

A theoretical frame for educational dropout

The current literature has no unequivocal and comprehensive definition of dropout, many researchers referring to this lack of uniformity in defining the phenomenon (Lahav, 2013; Dekkers & Claassen, 2001). For example, some authors define dropout as leaving the regular school even if the child continues to study in an alternative framework, while others define dropout only as a complete cessation of studies.

The general tendency when defining educational dropout is the focalisation on the physical departure of the child from the education system intended for his or her age group. Nevertheless, in the last decades the literature has increasingly started to emphasize the "hidden dropout" that expresses a process of disengagement among students who are still formally registered but who do not benefit from the learning process. Situations of disengagement are expressed in a high number of absences, low achievements that point to inadequate learning functioning, feelings of alienation toward the school, behavioural and social problems (Lloyd-Jones et al. 2010; Ferguson et al. 2005, Atkinson et al., 2000).

Dropout is a dynamic process, and today it is widely described using two concepts: overt dropout and covert dropout. Overt dropout describes a situation of physical disconnection of the youngsters from the education system. Among them, three distinct groups can be distinguished: (1) youths who have decided to disconnect from the education system and stop looking for educational alternatives; (2) youths who after a short period of time are cut off from the education system and start looking for a way to reintegrate back into the system; (3) All those youths who, because of unfortunate life circumstances and neglect, have remained outside the educational framework.

Covert dropout is represented by the group of youths who do not attend the educational framework frequently and if they do, they remain inactive in the classroom. It is important to note that covert dropout has no uniform and agreed upon definition, but there are signs that may help identify and locate it. The population group that has an increased risk of reaching the covert dropout situation is represented by youngsters who usually miss many schooldays and have a personal file with severe anti-social problems (Cohen-Navot et al., 2012).

The difficulty in accurately estimating the exact rate of youth dropping out of school every year stems from the complexity of the situation and the lack of reporting. A method is used by the Central Bureau of Statistics from Israel, according to which a national sample of the population of all ages is examined for their occupation. The findings of the

past few years show that the covert dropout encompasses a percentage similar to that of the overt dropout.

Many factors influence dropout. Some are connected to individual characteristics like personality, some are derived from the social environment like the family and the community, and some are derived from the way the education system is constructed and implemented (Cohen Navot et al., 2011).

Many studies point to the characteristics of youth personality as factors that cause dropout. Examples of individual characteristics that can lead to school dropout are: difficulties in self-discipline or postponement of gratification, difficulties in concentration, tendency to aggression, emotional problems and difficulties in coping with stress, low motivation or life crisis periods. The direct effects are low scholastic achievements and accumulation of school failures, difficulty in adaptation, and problematic school behaviour leading in the first phase to covert dropout (Knesting-Lund, O'Rourke & Gabriele, 2015; Ben-Rav & Kahan-Strawczynski, 2011). In the long run it can lead to negative attitudes toward the school, accumulation of school absences, a history of transitions from one school to another, and finally to complete educational dropout.

The family is the framework in which the child's basic experiences are shaped and in which they are equipped with the main resources that enable them to deal with the educational framework and to benefit from it. The literature shows for example that families with low socioeconomic status constitute a catalyst for school dropout (Dupéré et al. 2018). Families with many children, unemployed parents or low-income ones are associated with problems of dropout and low achievement (Ben-Rav & Kahan-Strawczynski, 2011). Other family characteristics like a weak father figure, lack of parental support for the child, and also associated with educational dropout (Ben-Rav & Kahan-Strawczynski, 2011; Englund, Egeland & Collins 2008).

From the cultural perspective, differences in the norms and expectations of children and youth, who come from different cultural backgrounds than the dominant ones at school, can sometimes lead to many difficulties in coping with school demands, especially among immigrant students; a thing that can lead to dropout (Dupéré et al. 2019).

Factors related to the educational system and schools are very influential towards the dropout phenomenon. Many researchers and educators point out that ineffective teaching methods, poor quality of teaching, low expectations from teachers towards their students performances, lack of funding and resources, and a multitude of irrelevant curricula are significant factors for dropping out (Cabus and De Witte, 2016; Knesting-Lund, O'Rourke & Gabriele, 2015; Ferguson et al., 2005).

There is a connection between scholastic achievements and future dropouts. It was found that low scholastic achievements and poor attendance are central characteristics prior to leaving the school. In addition, the students' low self-perception is also a critical feature in predicting dropping out the education framework. According to many researchers, there is a direct and unbreakable relationship between the feeling of social

alienation and the inability to function normally in school (Cohen-Navot et al., 2012; Cohen-Navot, 2011; Andrei, Teodorescu & Oancea, 2011).

In addition, studies indicate that adolescents who reported a high sense of alienation in their schools tended to be largely absent from school (covert dropout) and then stopped altogether from going to school (overt dropout). The findings also show that adaptation of the student to the school framework influences the decision of perseverance or dropout. The higher the student's adaptability is, the greater the chances of perseverance and stability within the school. One study argues that the greater the sense of self-efficacy of the teenager, the greater the level of adaptation to the school framework, which is expressed in the student's attitudes and behaviour (Shemesh, 2013). Negative attitudes toward school are among the aspects that characterize covert dropouts. Moreover, another study indicates that when teenagers have positive feeling towards the school and its staff, they would persist more in their studies than the adolescents who did not like the educational framework that would tend to commit vandalism and anti-social behaviour during their stay in the classroom (Motola, 2010).

Educational dropout in Israel

In modern Israel, the Ministry of Education has set a core goal to minimize the dropout problem. There are quite a number of youths, especially in the Arab population, who do not make the most of the educational frameworks available to them and they drop out early from the system (Shemesh,2013; Lloyd-Jones et al., 2010; Ben-Rav and Kahan-Strawczynski, 2011).

Looking at the statistical data, tremendous positive changes were made in the Israelian educational system for reducing educational dropout. Studies show that, 40 years ago, in 1980 the educational dropout rate for the Jewish population was 20,5 percent and for the Arab population 48,7 percent. Twenty years ago (data from 2001) the dropout rate decreased to 4,5 percent among Jewish youngsters and 20,7 percent for Arab youngsters (Cohen-Navot, Ellenbogen-Frankovits & Reinfeld, 2001). Latest official data show that today the dropout rate (data from 2019) is 2,2 percent for the Jewish youngsters and 3,2 percent for the Arab ones (Central Bureau of Statistics, 2019).

Even if the general data on educational dropout rates shows positive evolutions, studies show significant differences between the different categories of population and some differences on the quality of the educational process between the Hebrew and the Arabic educational systems (Altinok, 2010) that can influence negatively the dropout rates in the future. The most vulnerable categories of population in Israel from this perspective are the ultra-orthodox, the Arabs, especially the Bedouin population and the Ethiopian immigrant community (Arkin & Cojocaru, 2018).

Today, the covert and overt dropout rate in Israel is approximately 11%. The causes of dropout are many, but several specific causes for Israel’s young population were identified. One main factor is the transition from one formal framework to another during transition from middle school to high school (Ben Rav and Kahan-Strawczynski, 2011).

This situation involves many difficulties like increased subjects of study, the multiplicity of staff members, and the burden of learning difficulties. Besides this, also familial factors (such as divorce, parental unemployment, neglect), personal factors (learning disabilities) and cultural factors (immigration) are also contributing to the educational dropout of Israeli youngsters.

The education system in Israel has been coping with the dropout phenomenon for many years since education became compulsory in Israel and pupils are not allowed to drop out of the educational system. The system had to take immediate methods and actions to deal with the phenomenon.

The main methods of action that have been taken, include the existence of a variety of study tracks, that answer the students' needs and cope with their personal study pace. Another way to cope with dropout is expanding the possibility of taking matriculation exams, where pupils have the ability and the opportunity to finish and graduate school.

The education system is running unique programs which empower the pupil's personality, like horse riding, cooking, thinking skills and extreme sports. Such programs are also aimed at preventing dropouts.

Tendencies of educational dropout rates for youngsters from middle and high school in Israel, in the last ten school years – secondary data analysis:

Research design:

As stated before, recent data indicates that the educational dropout rates are continuously decreasing in Israel, showing that the measures undertaken by the national education system are effective from this perspective.

In this part of the article, using secondary data analysis, the aim is to analyse the main tendencies of the educational dropout of Israeli students from middle and high school level attending public schools in the last ten school years.

The source for the data used in the analysis is the Central Bureau of Statistics from Israel. Data released in the Statistical Abstracts of Israel for the last ten year (from 2010 to 2019 were investigated and data was extracted from the tables entitled "Students in Grades 7-12 who Dropped Out of the Educational System of the Ministry of Education", included in the Education section of the statistical abstracts.

Two variables were included in the analysis:

a) The grade in which the educational dropout happened. The Israelian education system has 12 mandatory grades, split into: primary school - grades 1 to 6; middle school – grades 7 to 9; and high school – grades 10 to 12.

b) The type of educational system. In Israel the national education system is divided into two main sub-systems: the Hebrew Education System, addressed to the Hebrew speaking nationals and the Arab Educational System, addressed to the Arabic speaking ones. Both systems operate by the same structure, described within variable one.

Secondary data analysis:

Using both variables, from the data extracted resulted Table 1, depicting the educational dropout rates for students from grade 7 to 12, in the last ten school years, separated by the two main educational systems: Hebrew and Arabic. At the end, a ten-year mean was calculated also divided by grades and educational systems.

Table nr. 1. Dropout rates for middle school and high-school students in Israel's educational system

		Grade 7	***Grade 8***	***Grade 9***	***Grade 10***	***Grade 11***	***Grade 12***	***Total***
2008/2009 - 2009/2010	Hebrew	1,2	5,5	5,3	3,8	6,9	2,1	4,2
	Arab	1,8	4,6	15,7	7,0	6,4	1,3	6,2
2009/2010 – 2010/2011	Hebrew	0,6	2,4	2,7	3,0	5,6	1,8	2,7
	Arab	1,0	4,2	10,4	5,5	5,3	1,8	4,7
2010/2011– 2011/2012	Hebrew	0,6	2,0	2,6	2,8	6,2	1,5	2,6
	Arab	1,1	4,1	9,7	5,7	5,1	2,0	4,6
2011/2012– 2012/2013	Hebrew	1,0	2,7	2,9	2,7	6,0	1,6	2,8
	Arab	1,3	3,8	9,8	6,0	5,2	1,8	4,7
2012/2013– 2013/2014	Hebrew	0,7	2,3	2,2	2,4	5,4	1,4	2,4
	Arab	1,0	3,6	8,6	5,2	4,6	1,6	4,1
2013/2014– 2014/2015	Hebrew	0,6	2,0	1,9	2,1	5,0	1,1	2,1
	Arab	1,3	3,1	7,4	4,1	3,7	0,9	3,5
2014/2015– 2015/2016	Hebrew	0,7	2,1	2,2	2,0	5,1	1,3	2,2
	Arab	0,8	2,9	7,2	4,3	3,9	1,0	3,4
2015/2016– 2016/2017	Hebrew	0,7	2,0	2,0	2,0	5,4	1,3	2,2
	Arab	1,3	3,3	7,5	4,0	3,7	1,1	3,5
2016/2017– 2017/2018	Hebrew	0,7	2,0	1,9	1,9	4,8	1,3	2,1
	Arab	1,1	3,0	7,4	4,2	3,9	1,2	3,5
2017/2018– 2018/2019	Hebrew	0,8	2,2	1,8	1,9	5,4	1,2	2,2
	Arab	0,9	3,2	6,6	3,7	3,7	1,0	3,2
Ten-year mean	***Hebrew***	***0,76***	***2,52***	***2,55***	***2,46***	***5,58***	***1,46***	***2,55***
	Arab	***1,16***	***3,58***	***9,03***	***4,97***	***4,55***	***1,37***	***4,14***

Source: Central Bureau of Statistics – Statistical Abstracts of Israel 2010 to 2019 (no, 61 to 70) - Students in Grades 7-12 who Dropped Out of the Educational System of the Ministry of Education

Analysing the table, the most obvious observation that can be made is the gap between the two education systems in relation with school dropout, the Arab educational system registering considerably higher rates than the Hebrew (a ten year mean of 4,14 percent compared to only 2,55 percent).

First observation that can be made from Figure 1 is that even if there are differences in dropout rate between the two systems, the general tendencies seem to function in mirror. For example, a high reduction of dropout rate can be observed for both educational systems in the first interval (from 6,2 percent to 4,7% for the Arab educational system and from 4,2 percent to 2,7 percent for the Hebrew educational system.

Figure 1 shows the yearly general dropout rates by educational systems:

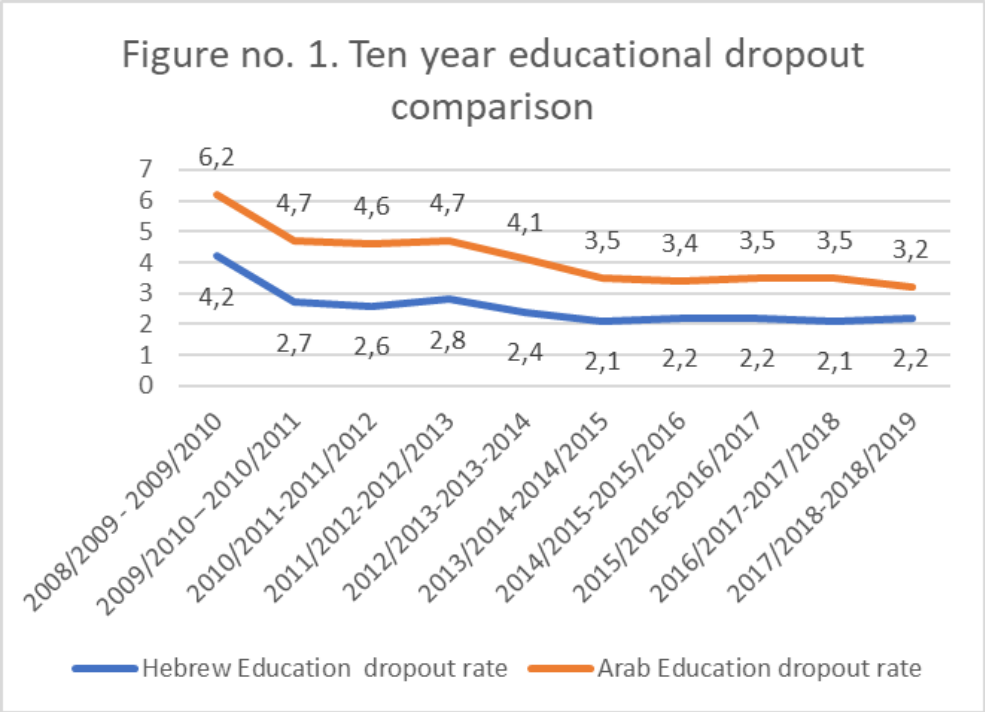

Figure 1. Ten-year educational dropout comparison

Continuing, both systems tend to have slightly increased dropout rates between the school years 2011/2012 and 2012/2013 after that both dropping the rate again considerably and maintaining lower rates continuously for the next school years. And finally, both educational systems register slightly lower rates between the last two school years.

The second observation is that both educational systems registered important decrease in school dropout in the last ten school years, the Hebrew system decreasing from 4,2 percent to 2,2 percent (2 percentual points). The Arab system registered even a higher reduction of the dropout rates: 3 percentual points from 6,2 percent to 3,2%.

And finally the third observation on the data from Figure 1 is that the gap between the two educational systems has been reduced also in the last ten school years, starting from 2 percentual points in the first three intervals and reaching only 1 percentual point difference between the last two school years (3,2% dropout rate the Arab educational system, compared with 2,2% dropout rate for the Hebrew educational system).

Continuing with the secondary data analysis, Figure 2 reveals a comparison of the dropout rates between the two educational system by grades. The value considered is the ten-year mean of the dropout rate.

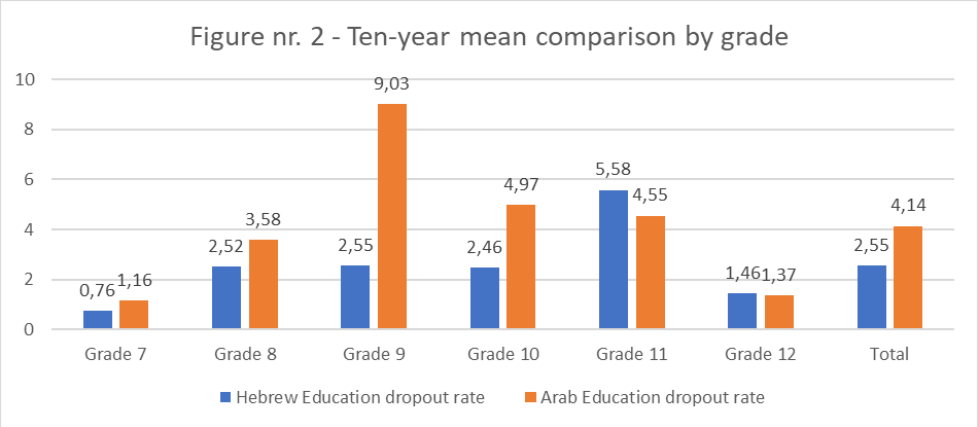

Figure 2. Ten-year mean comparison by grade

In the seventh grade (first grade of middle school) both dropout rates register low levels (0,76 percent for the Hebrew education system and 1,16 percent for the Arab education system), slightly higher for the Arab education system (plus 0,4).

In the eighth and the ninth grade the dropout rate for the Hebrew education system is very similar to the general mean (2,52/2,55 percent compared with 2,55% general mean). The Arab educational system registers in the eight grade dropout rates below the mean (3,58 percent compared with the mean of 4,14 percent), but in the ninth grade the dropout rate is more than twice in comparison with the general mean (9,03 percent compared with 4,14 percent). The data reveals in consequence that youngster attending the Arab educational system tend to dropout massively after middle school completion.

Following the high school period, the tendencies are kept in the tenth grade, youngsters attending the Hebrew educational system having similar dropout rates than the general mean (2,46 percent compared with 2,55%). Also, the dropout rate from the Arab educational system is only slightly higher than the general mean (4,97 percent compared with 4,97 percent).

The eleventh grade show a turn from the general tendencies, the Hebrew educational system registering a dropout rate almost double compared with the general mean (5,58 percent compared to 2,55 percent) and even higher than the dropout rate of the Arab educational system for the same grade (5,58 percent compared to 4,55 percent). The Arab educational system dropout rate at this stage is only slightly higher than its general mean (4,55 percent compared with 4,14 percent).

The twelve grade shows low dropout grades for both educational systems. The Hebrew education system registers 1,46 percent dropout rate compared with the 2,55 percent of the general mean. Interesting enough, the Arab education system registers only 1,37 percent dropout rate in the twelve grade, meaning a rate that is three time lower than its general mean (4,14 percent) and even lower than the similar one from the Hebrew education system.

1. Conclusions

The importance of reducing the educational dropout rates is clear do to the variety of societal dimensions that it affects. The secondary data analysis and other recent studies show that the phenomenon of dropping out in Israel is effectively handled in the last decade by the responsible authorities as general tendencies of the educational system in this regard. The general dropout rate continuously decreased, both for the Hebrew and Arab education system. Even if the dropout rates for the Arab educational system remain higher, the gap between the two systems decreased also in the last decade.

For the Arab educational system, the dropout rate during and after the ninth grade stands out, revealing a persistent structural barrier for the youngsters attending this system to access high school studies.

Further research needs to be done on recent data that should explore in depth the problematic and expend the analysis on in-risk categories of young population, like the ultra-orthodox, Ethiopian immigrants (Arkin & Cojocaru, 2018) and the Bedouin population.

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Tertiary education dropout– general tendencies for the last generations of students

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Abstract

Higher education dropout, or abandonment, represents a contemporary worldwide socio-economic problem that may be one of the main barriers in the future efforts of the younger generations to bring the world economy forward. Why do students leave higher education prematurely? What can be done to help solve this problem? Does our Higher Education System have a coherent support system to prevent dropout? are the core questions on this important issue. The role of education in the young generation's development and the different factors that support or impede this process represent frequently researched topics in the field of applied socio-human sciences, especially during the last decades that are also characterised by important changes in the educational services delivery.

The current article constitutes the preliminary work for a future doctoral thesis that aims to investigate the issue of contemporary educational dropout in Romanian universities following data from the last decade. Firstly, some theoretical elements on educational dropout in general will be explored, starting by defining the concept, continuing with the exploration of the main theories and finalising by detailing the main factors that influence university dropout.

The last part of the present work follows as a study case the dropout rates of the last three generations of bachelor level students from a social sciences faculty of a state university from Romania. Based on secondary data analysis, the dropout rates are calculated in four steps in order to reveal the dynamics of the process during a bachelor study cycle, being presented the specificities of all four departments of the faculty.

***Keywords**: tertiary education, dropout rate, risk factors.*

Introduction

Even if international research in the domain belongs to different ideological currents, it always highlights the importance of school and the role it plays in the educational development of the child. The educational system supports the dynamics of contemporary society, all over the world, and especially in Romania, a country which is in a stage of changes and reorganizations of new paradigms, which value and inspire modern pedagogies based on the discoveries of human developmental psychology.

Higher education, with all its structures, its internal processes, and external influences, goes through a process of conceptual and organizational transformation which promotes a new paradigm of academic education trying to respond to the needs of a dynamic society that is constantly reforming. The existence of a quality education system that is

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accessible to all is the most important condition for the coherent development of a state and the reduction of inequities among the population, both economically and socially. In order for this condition to be met, it is important that education is considered a priority for all decision-makers in a state and treated with due responsibility. University dropout has negative long-term effects on social development and economic growth. Innovation and growth are based on the skilled workforce: reducing the European average early school leaving rate by one percentage point would give the European economy almost half a million potential young skilled workers each year. Students come to university for a variety of reasons, ranging from clear goals related to their future academic and professional careers to leaving home, having fun, finding new friends, meeting parents' expectations, postponing market placement work and so on. Most of the students are being attracted by the mirage of student life or, perhaps, by the prestige of the institution. Some of the main reasons which conduct to students' dropout are represented by dissatisfaction with motives and expectations, unrealistic expectations, as well as their lack of clarity/specificity, emotional preparation and poor academic skills, adaptive difficulties (shock), and marginalization from the academic process. Adaptive difficulties are both academic and social, ranging from those related to workload management, independent study, and responsibility for one's learning, to broader management of time, budget, social life, emotional issues, and so on.

2. Theoretical considerations on educational dropout at university level

In Romania, concerns about access and equity in higher education are older, having roots in the pre-, interwar, and communist periods. The literature marks a series policies examples that encourage children of peasants and workers, respectively from disadvantaged backgrounds, to access secondary school and afterward to higher education: from school construction and the founding of new universities, massive investments in teacher training and special scholarships granted a diversity of categories of pupils and students.

Given the special conditions under which the reform takes place, like rampant globalization, accelerated technical and scientific developments and the IT revolution, as well as its area of action, structure, and content of studies, harmonization of cycles and programs, scientific research, criteria for assessing program quality education and learning outcomes, we must admit that academic reform is in a continuous process, a process of permanent adaptation to the constantly changing economic and social realities. Given that the education system is a conservative one - with great inertia, all over the world - changes in this area require thorough, adequate training. A great vulnerability of the education system is found when graduates do not have the ability to quickly enter the labour market and capitalize on their intelligence in high-tech fields. As a result of the demographic decline, the number of students is constantly decreasing, which increases the competition between universities - the dynamic ones with shorter study durations being more attractive for young people. Higher education in developed

countries has been in the process of repositioning itself in recent decades in terms of its economic and social role. However, the dominant discourse in the field of higher education development is that of the knowledge-based economy. Therefore, higher education must, on the one hand, respond to the skills training required by an increasingly dynamic labour market and, on the other hand, become a driver of continuous innovation. Therefore, higher education tends to become in many countries an important sector of the economy, in international competition.

Arguments for the need to strategically address the issue of dropping out of university are also outlined from the perspective of the desideratum, imperatives, and recommendations for higher education existing in the agendas and official documents of the European Union. The Europe 2020 strategy imposes as major objectives at the level of the European Union and the Member States the reduction of the early school leaving rate below 10% and the increase of the share of the population with higher education between the ages of 30 and 34. The strategy associates higher levels of education with better income at individual level and with general economic development at societal level (Johnstone and Marcucci, 2010). From this perspective, the National Strategy for Sustainable Development of Romania (2008) has as medium and long term objectives, among others, the positioning of the Romanian education and training system at the level of higher performances in the EU, respectively the significant approach to the EU average regarding the educational services offered in rural areas and for people from disadvantaged or disabled backgrounds. Mass education is associated with the democratization of society, with equitable, non-discriminatory access to education in general and to tertiary education in particular. ”Despite the importance of education for individual and societal development”, Cummings (2007, p. 273) points out that ”in the information society, the school in its classical form finds it difficult to cope with information alternatives (media, internet, etc.), teenagers often say they are bored with school”. Deci et al. (1991, p. 325) argue that “the ideal school system is the one that is successful in promoting among students the enthusiasm for learning and self-realization, respectively a sense of volitional involvement in school structures”. The classical education system based on the theoretical dimension is subject to criticism, and, more recently, “the emphasis is on learning through practical experience and work” (Giarini & Maliţa, 2005, p. 55).

Although the share of the population aged between 30-34, with a level of tertiary education, has registered a constant increase, of approx. 5% in recent years, the graduation rate of tertiary education is one of the lowest in the EU (25.6% in 2015, compared to 38.7% in the EU). This situation is caused by several factors that reduce young people's access to tertiary education such as the relatively low passing rate of the baccalaureate exam and the high rate of early school leaving. Additionally to these factors, there are other realities that can lead to the decision to drop out of tertiary studies such as insufficient relevance in the labour market of some of the university specializations or limited opportunities in university programs to develop transversal skills, considered

valuable for increasing employability. The assumption in the National Strategy for Tertiary Education (2015) of objectives such as improving participation at all levels of tertiary education and the development of flexible, high quality, and labour market-relevant curricula, are goals in which this strategy may be anchored. The number of university centres or university education programs we have in Romania is a generous one. A relevant example for this stat is represented by a report published by the European Commission in 2017 (EC, 2017) that ranks Romania as being 3rd in the European Union in terms of university dropout. The average reported at the level of the European Union is 11%, while for Romania we have an average of 18%.

Theories on educational dropout in higher education

The main paradigm in research on dropout and academic persistence is "The Model of Student Integration", proposed by Tinto (1975). In this model, dropout is seen as a result of the following factors: characteristics of the student, prior to their entry into studies (family background, high school education, individual skills and abilities), goals and initial commitments (goals for their own career, commitment compared to the institution where it was admitted) academic (institutional experiences in the academic environment that include school performance, intellectual development) and social (institutional experiences in the academic environment that includes interaction with teachers and colleagues), goals and final commitments (educational goals and career influenced by institutional experiences).

Another well-established model is "The Student Dropout Model", developed by Bean and Metzer (1985) which emphasizes the role that events external to the academic context play in fostering dropout (e.g., financial resources). However, subsequent studies have shown that the best understanding of academic dropout is provided by the integrative approach of the two models (Sandler, 2000). Although this integrative model does not explain much more of the variant of abandonment than previous models (43% compared to 45%) its merit is that it analyses more accurately the complexity of the abandonment phenomenon than previous models (Sandler, 2000). It includes some important concepts for understanding dropouts such as self-efficacy in the decision on one's career, perceived stress, financial difficulty while emphasizing that financial aid has a beneficial effect on student retention.

Student involvement represents another factor proposed in the literature with effects on educational dropout, tested in numerous empirical studies (Berger & Milem, 1999). Student involvement is defined as physical and psychological energy dedicated by the student to academic experience (Astin, 1984). Thus, it was found that the involvement of students in activities with teachers and colleagues has a positive effect on the retention of students in the university. The involvement behaviours shown by students since the beginning of the first semester are a good predictor of further studies in the next year. In general, the models presented above are briefly useful to explain the phenomenon of

academic dropout found in various groups of students. For example, adult students can spend less time studying than traditional students or students from minority groups.

Who are those who drop out of college?

Recent studies (Edwards & McMillan, 2015), conducted internationally, show that there are several characteristics regarding the types of students who drop out most frequently. Firstly, the completion rate is low for students enrolled in part-time education, those from isolated geographical areas, students over 25 years of age, and those with low socioeconomic status. Secondly, the dropout rate increases when a student belongs to several risk groups at the same time. For example, students with low socio-economic status are usually enrolled in part-time courses because they must work to support their studies financially. In their case, when the factors are cumulated, the risk of dropout increases (54%) compared to that of students from poor socio-economic backgrounds (31%) who are exposed to only one risk factor. Moreover, if their age exceeds 25 years, they are exposed to a much higher risk of abandonment (57.4%). More than that, most students drop out in the first year of college, academic integration being an important factor in explaining further studies, and the presence, during this period, of the intention to continue is the best predictor of further studies. However, it should be noted that, at different levels of study, the factors influencing dropout are different (Edwards & McMillan, 2015).

A series of recent studies highlight the external nature of causes for educational dropout, considering (Sahin, Arseven & Kiliç, 2016) that are not associated directly with the educational system. The main external categories of factors found in the literature are familial factors and community level factors. Community level factors include segregated and isolated communities with high levels of unemployment and criminality. Familial factors encompass poverty situation, mono-parental families, traditional culture that force the youngsters to assume early roles for directly providing for the family and inconsequence to not attend or leave early their educational track (Sahin, Arseven, & Kiliç, 2016). The turning point of the reorganizations of the educational system is defined especially by the new relations with the family. Thus, instead of the distance and the autonomous functioning of the family and the school, collaboration occurs to preserve the continuity between the family and the school relationship in the child's living environment.

For example, students who drop out in the first year of college attribute an important role to external factors, such as the job-study conflict. Students that drop out later, in final years, invoke poor academic integration as a reason for dropping out. Dropout may also be influenced by the following academic factors: insufficient correlation of curricula with employers' expectations and labour market requirements, insufficient number of accommodations in dormitories, insufficient number of scholarships available for low-income students, limited access to counselling and mentoring activities, disproportionate expectations from courses about the contents taught. In general, however, students who

drop out of school consider academic as well as financial factors as the main reasons for dropping out. Dropping out of higher education is influenced by lack of finances, which causes students to occupy early a place on the labour market, to the detriment of attending classes and seminars. Many of the students that are also employed, come from families with low financial potential, and are forced to work to support themselves. Once employees, they are forced to have their study time reduced, and no longer participate in courses and seminars, accumulate failed exams, and thus the phenomenon of social disinsertion occurs. In such situations, it is recommended to identify the students with educational potential and introduce them in financial support programs. An analysis made by the National Alliance of Student Organizations in Romania shows that the university dropout rate has as main cause financial elements, in the first instance, closely followed by the wrong choice of specialization or faculty. Specifically, 40% of Romanian students drop out in the first year of study, and 41% of dropout students believe that this is caused by the wrong choice of specialization.

Students dropout rates for the last three generations of bachelor level studies – Study case: The Faculty of Sociology and Psychology from West University of Timișoara

In order to depict the evolution of students' dropout rates, a secondary data analysis was undertaken using official data collected from the yearly reports published by the Faculty of Sociology and Psychology from West University of Timișoara. The faculty is the second largest from WUT, being in the last years one of the faculties on the raise from the perspective of number of students. As structure, the faculty has four main departments: Social Work (with two bachelor programs and one masters program), Psychology (with one bachelor program and three masters programs), Sociology (with two bachelor programs and two masters programs) and Educational Sciences (with three bachelor programs and two masters programs).

Research design

The data collection focused on the last three generation of bachelor level students (2015-2018, 2016-2019 and 2017-2020) from each of the four departments of the faculty.

The data collected was structured on the following aspects: (1) the number of students that started in the first year; (2) the number of students that started the second year; (3) the number of student that started the third year; (4) the number of student that graduated bachelor studies after the third year; and (5) the number of students that passed the license exam.

To follow the dropout rate evolution, four dropout rates were calculated: the first dropout rate as percentage of students lost between the 1st and 2nd year of study; the second dropout rate as percentage of students lost between the 1st and 3rd year of study; the third dropout rate as the percentage of students lost from the start of the 1st year and

the finalisation of the 3rd year (all exams passed); and the final dropout rate was calculated as the percentage of students lost from the start of the 1st year and the finalisation of the licence exam.

Data analysis:

The data analysis section is structured on the four departments of the faculty and follows the specific tendencies on dropout for each of them.

The Social Work Department

As depicted in Table 1, the final dropout rate mean of the students from the Social Work Department is 42,66 percent (calculated as the mean of the two available Final dropout rates available).

Table nr. 1. Three generation dropout rates from bachelor level students of the Social Work Department

Social work Department	Started 1st year	Started 2nd year	*Drop out rate 1 (%)*	Started 3rd Year	*Drop out rate 2 (%)*	Finished 3rd year	*Drop out rate 3 (%)*	Licensed	*Final droout rate (%)*
2015-2018 Bachelor level generation	72	55	*23,61*	58	*19,44*	37	*48,61*	37	*48,61*
2016-2019 Bachelor level generation	79	70	*11,39*	61	*22,78*	53	*32,91*	50	*36,71*
2017-2020 Bachelor level generation	97	82	*15,46*	75	*22,68*	NA	*NA*	NA	*NA*

The dropout rate from the 1st year to the 2nd year ranges between 11,39 percent and 23,61 percent, fluctuating in each generation. The dropout rate from the 1st year to the 3rd year is sensibly similar for all three generations ranging between 19,44 percent to 22,78 percent[1]. The dropout rate from the end of the third year and the final dropout rates register similar values (the same for the 2015-2018 generation, and with a small difference for the 2016-2019 generation – from 32,91 percent to 36,71 percent), meaning that almost all the students that manage to graduate the three year bachelor study program are also managing to pass the licence exam.

The Psychology Department

The highest Final dropout rates are registered at the Psychology Department, with a calculated mean of 60,99 percent (Table 2).

Table nr. 2. Three generation dropout rates from bachelor level students of the Psychology Department

[1] The second dropout rate can have values lower than the first dropout rate due to the students that previously have temporarily dropped out from the studies and re-register for continuing them.

Psychology Department	Started 1st year	Started 2nd year	*Drop out rate 1 (%)*	Started 3rd Year	*Drop out rate 2 (%)*	Finished 3rd year	*Drop out rate 3 (%)*	Licensed	*Final drop out rate (%)*
2015-2018 Bachelor level generation	249	182	*26,91*	199	*20,08*	109	*56,22*	88	*64,66*
2016-2019 Bachelor level generation	246	180	*26,83*	225	*8,54*	130	*47,15*	105	*57,32*
2017-2020 Bachelor level generation	241	172	*28,63*	207	*14,11*	NA	*NA*	NA	*NA*

The dropout rate evolution for the students of the Psychology Department is particular, especially due to the high number of students that interrupted the studies at some point (temporarily dropped out) and decide to re-register for continuing, this influencing the intermediary dropout rates presented in table no.2.

The dropout rates from the 1st year to the 2nd year are similar for all the three generations of students, ranging from 26,83 percent to 28,63 percent. The second dropout rate analysed (from the 1st year to the beginning of the 3rd year) varies more, from 8,54 percent to 20,08 percent but without any chronological tendencies.

The dropout rates from the graduation moment are very high, these not being influenced by the re-registering process. They range from 47,15 percent to 56,22 percent. For the final dropout rates, considered after the licence exams, the percentage raises with approximatively 10 points for each of the two generations were data was available, reaching a range between 57,32 and 64,66 percent.

The Sociology Department

The Sociology Department registers the second highest Final dropout rate, with a mean of 45,86 percent (table 3).

Table nr. 3. Three generation dropout rates from bachelor level students of the Sociology Department

Sociology Department	Started 1st year	Started 2nd year	*Dropout rate 1 (%)*	Started 3rd Year	*Drop out rate 2 (%)*	Finished 3rd year	*Drop out rate 3 (%)*	Licensed	*Final dropout rate (%)*
2015-2018 Bachelor level generation	90	77	*14,44*	76	*15,56*	48	*46,67*	48	*46,67*
2016-2019 Bachelor level generation	91	76	*16,48*	72	*20,88*	60	*34,07*	50	*45,05*
2017-2020 Bachelor level generation	115	96	*16,52*	90	*21,74*	NA	*NA*	NA	*NA*

The first dropout rate considered (that between the 1st and the 2nd year of study) is sensibly similar for all the three generations investigated, ranging from 14,44 to 16,52 percent, with a weak tendency of growth. The variation is higher for the dropout rates calculated at the beginning of the 3rd year, ranging rom 15,56 to 21,74 percent, also with a growth trend for the later generations.

The dropout rates calculated at graduation have a different tendency, with large variance: the 2016-2019 generation registers a dropout rate with more that 10 percentual points lower than the 2015-2018 generation (34,07 compared with 46,67 percent). Despite this positive trend, the final dropout rate, considered after the licence exam, is almost the same for the two generations (45,05 and 46,67 percent).

The Educational Sciences Department

The lowest Final dropout rates are registered by the Educational Sciences Department, with a calculated mean of 31,33 percent (see Table 4).

Table nr. 4. Three generation dropout rates from bachelor level students of the Educational Sciences Department

Educational Sciences Department	Started 1st year	Started 2nd year	*Drop out rate 1 (%)*	Started 3rd Year	*Drop out rate 2 (%)*	Finished 3rd year	*Drop out rate 3 (%)*	Licensed	*Final drop out rate (%)*
2015-2018 Bachelor level generation	122	117	*4,10*	120	*1,64*	91	*25,41*	90	*26,23*
2016-2019 Bachelor level generation	129	117	*9,30*	118	*8,53*	99	*23,26*	82	*36,43*
2017-2020 Bachelor level generation	171	156	*8,77*	147	*14,04*	NA	*NA*	NA	*NA*

Even if low the dropout rate between the 1st year and the 2nd year varies between generations from 4,10 to 9,30 percent with a tendency to grow for later generations. The variance is even higher for the dropout rate between the 1st year and the beginning of the final year (between 1,64 and 14.04%) also with a clear tendency to grow for the later generations. It is worth mentioning that also in the case of the Educational Sciences Department, the high number of re-registering after temporary dropout at the beginning of the 2nd and the 3rd year influences the data considerably.

Dropout rates at graduation are sensibly similar for the two generations with available data, ranging from 23,26 to 25,41 percent.

The final dropout rates, considered after the licence exam, differ for the two generations analysed. The 2015-2018 generation has almost the same rate as the graduation point (26,23 compared with 25,41 percent), but for the generation 2016-2019

the dropout rate increased with more than 13 percent from the graduation until the licence exams (36,43 compared with 23,26 percent).

Discussions and conclusions:

As a general tendency of the dropout rate between generations of students, it can be observed that the last generations have lower rates in three out of the four departments analysed.

The dropout rates are high during the first and the third year (1st and 3rd dropout rate calculated). As a particularity for a department with large number of students, at the Psychology Department there is significant dropout also between the graduation and the licence exam.

In the present society, with its dynamic development, university level studies are extremely important. Highly specialised employees are needed on the labour market in order to face the quick pace of technological and social changes happening today. The right to quality education is fundamental for the individuals well-being and for the general development of the society.

The importance of addressing seriously, quickly, and effectively the educational dropout phenomenon at university level is obvious. The secondary analysis reveals high rates of the phenomenon and shows some trends, differentiated on departments and generations of bachelor level students. Mainly descriptive, the study will be continued and developed. Some of the research questions that result from the secondary analysis and need to be followed are: What are the main reasons for students to dropout from the educational system? What is the context in which later generations have the tendency to have higher dropout rates that the previous ones? Why high temporary dropout happens at the Psychology and Educational Department? What are the causes for the big gaps between the graduation dropout rates and the ones after the licence exams?

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IN MEMORIAM
PROFESOR DOREL UNGUREANU,
A TEACHER WITH AN ORGANIZATIONAL CALLING
31st of May 1950 – 14th of August 2015

Associate professor dr Elena Liliana Danciu,
senior member of WUT

If the stars had been aligned differently at his birth on the very last day of May 1950 in the village Dioşti, Dolj county, this year in 2020, he would have celebrated with 70th birthday. But on the 14th of August 2018 he left, because he had to pay the cruel tribute to nature and there is no cure against the power of death. He left behind a ray of light that he hoped would be an open road.

We shouldn't talk about Dorel Ungureanu in the past tense, we should talk about Dorel Ungureanu who lives on and will continue to live on through his thinking and everything that he has done for the West University of Timişoara when he put forward Pedagogy and later the field of Educational Sciences among the recognized schools of this country.

His educational trajectory demonstrates the intellectual coming of age of the one who came to be the university professor, Dorel Ungureanu. A graduate of philosophy, specialized in pedagogy and English language (1972-1976) at the University of Bucharest. In 1995, he was awarded a PhD in Pedagogy based on a dissertation titled: „The resonance of feedback and the level of redundancy in oral school communication" and supervised by professor dr. Ioan Cerghit. He worked as a school-based speech therapist, as a counsellor and teacher of pedagogy, then later as a lecturer, associate professor and full professor at the university. Since the establishing of the Educational Sciences Department in 1997 until 2011, with a break in between the years 2000 and 2004, when he served as deputy dean, he has acted as the chair of the Department of Educational Sciences. These times were not too transparent, one could say even agitated, they required many transformations and reconfigurations of higher education. His balance, openness and reconciliatory manner, his amiable collaboration with colleagues created a managerial brand recognized by the members of all teaching departments within the university. He knew how to preserve the syntality of the group, he stimulated us to feel good with one another. He was not faced with an easy to manage collective, but he build with caution and prudence. He always tried to maintain a right measure, becoming an expert at conflict resolution through his moderation, politeness, temperance, balance, modesty, critical thinking and self-irony.

As a PhD supervisor in the Cluj based university, he was respected and easily came to integrate in the prestigious collective there. This allowed for a better relationship with Cluj-Napoca based academics both academically, as well as personally.

An exploring personality, he made his name in Romanian pedagogy in his chosen research directions: curriculum, the theory of evaluation and inclusive education. His entire scientific experience was made fruitful in the volumes so well known to students and teachers alike: his courses: *The Foundations of Education* and *the Theory of the Curriculum* (1999), *the Theory and Practice of Evaluation in Education and Comparative Pedagogy* (2001); books as a single author: *a Compendium of School-based Speech Therapy* (1998), *Children with Learning Difficulties* (1998), *Education and Curriculum* (1999), *Integrated Education and the Inclusive School* (2000), *The Red Pen Terror* (2001); edited volumes: *Pedagogy and elements of education psychology* (2005), co-edited with I. Dumitru, *Introduction to Adult Education* (2005), co-edited with Simona Sava, *Adult Education -theoretical Foundations and Practical Landmarks* (2005), co-edited with Ramona Paloș and Simona Sava. He was a member of the Editorial Board of the Revista de Ştiinţe ale educaţiei/ Journal of Educational Sciences, ever since the founding of the journal, warranting its scientific value.

The academic structure that he chaired was not the only one that profited from his pedagogical and managerial expertise. He supported the establishing, development and functioning of the Teacher Training Department with openness, collegiality and constructive spirit. He was always a factor of harmony and balance, contributing to the establishing of relationships based on trust and interdisciplinary collaboration, a fact that increased the prestige of the Faculty of Sociology and Psychology both within WUT, as well as in our entire academic community.

A teacher by calling, he knew how to make himself loved, respected not only by students, but also by WUT colleagues and those of other universities throughout the country. He managed to gain trust and respect, communicate in a way that would go straight to the heart, to share and build, remaining a good comrade in discovering human truths and values of this world.

A strong and charismatic personality, likable, he emanated an unnamable combination of joviality and academic rigor, a subtle sense of humor and a sovereign calm, a matter-of-fact way of going about things and a human warmth capable to unwind any shadow of a conflict, but also to put values back in place in a hierarchy of normality without any exaggeration. We are grateful that on the long road to eternity, he stopped for a moment close to us and he left with us the very best of his mind and soul through what he created and wrote.

RESPECT AND ADMIRATION TO YOU, PROFFESOR DOREL UNGUREANU!